Cleaning & Deconstruction of 130 Liberty Street
ADDENDUM # 1 – June 15, 2005

Revised Deconstruction Plan

LMDC hereby provides you with revised versions of the four sections (1,2,3,5) of the 130 Liberty Street Deconstruction Plan that were previously included in the 6-13-05 Invitation to Bid which included the Waste Management Plan, the Ambient Air Monitoring Plan, the Emergency Action Plan (EAP) and the Health and Safety Plan (HASP). Additionally, LMDC provides you with Section 4, the Asbestos and Contaminants of Potential Concern (COPC) Abatement and Removal Plan, which was not included in the original bid package.

Note that the enclosed sections 1, 2, 3, and 5 of this Addendum supersede and replace the portions of the Deconstruction Plan enclosed in the original bid package. Therefore, Attachment 7: Deconstruction Plan, should be removed from the 6-13-05 Invitation to Bid and replaced by the enclosed, revised sections and new Section 4 of the Deconstruction Plan.

To view the revised Deconstruction Plan online, click here:
http://www.renewnyc.com/plan_des_dev/130liberty/deconstruction_plan.asp

WASTE SAMPLING AND MANAGEMENT PLAN
FOR THE
130 LIBERTY STREET
DECONSTRUCTION PROJECT

June 13, 2005

LOWER MANHATTAN DEVELOPMENT CORPORATION
1 Liberty Plaza
New York, New York 10006

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ATTACHMENTS

1. OBJECTIVE

The objective of the Waste Sampling and Management Plan (Plan) is properly to classify, manage, containerize, transport**,** and dispose of (or recycle), in conformance with all applicable laws and regulations, waste streams that will be generated as part of the 130 Liberty Street - Deconstruction Project.

1.1. BACKGROUND

This plan covers all of the activities to be undertaken during the Deconstruction Project, which will occur in the following three phases:

- Preparation Phase
- Phase I – Asbestos and COPC Abatement and Removal
- Phase II – Structural Deconstruction

The Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, erection of sidewalk sheds, the removal of existing netting.

Phase I of the Deconstruction Project includes the cleaning and removal of all interior surfaces and non-structural elements within the building under containment. The cleanup and abatement will be conducted so that the building at 130 Liberty (Building) can be safely deconstructed to allow for redevelopment of the WTC Site. Phase I of the Deconstruction Project will occur while the work area is placed under negative pressure containment and includes the following general categories: (a) the general area cleanup of WTC dust and debris, (b) removal and disposal of installed porous and certain non-porous building materials and components, (c) cleaning and salvage of certain installed non-porous building equipment and components, (d) removal of building materials containing asbestos which were present in the Building prior to September 11th, 2001 (referred to herein as "ACBM"), primarily within the Building interior, (e) packaging of asbestos and other regulated waste including, but not limited to light bulbs, lighting ballasts, batteries, mercury-containing thermostats, etc.) at generation points, movement of containers to the decontamination unit and movement of decontaminated containers to waste loading using an exterior hoist or crane, and (f) cleaning of limited, exterior surfaces as necessary to facilitate the erection of the man-hoist and the crane.

During all Phase I activities, a minimum buffer zone of three floors initially for the top three floors and then two floors thereafter, will be maintained between the active abatement and clean-up (Phase I) area and the exterior abatement/structural demolition (Phase II) portion of the project. The proposed cleanup and abatement will be conducted so that the Building can be safely deconstructed in compliance with applicable law to allow for redevelopment of the WTC Site.

Phase II of the Deconstruction Project includes the cleaning of the exterior of the building (i.e building washdown), structural deconstruction of the remaining cleaned steel, concrete, and curtain wall as well as the removal of the Building exterior and the roof.

The information in the *Supplemental Investigation Summary Report - Preliminary Waste Characterization Sampling Summary Results* for 130 Liberty Street dated February 10, 2005 prepared for LMDC by TRC Environmental Corporation (Preliminary Waste Characterization) and the *130 Liberty Street Initial Building Characterization Study Report Volume I, September 14, 2004* by the Louis Berger Group, Inc. (Initial Building Characterization), as well as information in this Plan, will be utilized by the Contractor and its Subcontractors to determine the appropriate transportation and disposal for the generated waste in accordance with applicable federal, state and local regulations. The Environmental Consultant will characterize the waste streams to be generated. Based on the results of this characterization, once analytical results are received, the Environmental Consultant will issue an addendum to the Plan, if necessary. The Contractor or its authorized representative will ensure proper handling and disposal activities as described in this Plan.

1.2. ROLES AND RESPONSIBILITIES

Involved entities are identified in this Plan by title/responsibility. The roles and responsibilities identified below are provided for the generically identified organization rather than for specific corporate entities. It should be noted that these roles and responsibilities are provided for informational purposes herein, and should not be construed as being representative of contractual obligations, responsibilities or liabilities.

Within this Plan, the "Owner" is the Lower Manhattan Development Corporation (LMDC).

The "Deconstruction Team" for the Deconstruction Project is made up of the Contractor and the Contractor's subcontractors, including the Environmental Consultant.

The "Contractor" is responsible for ensuring that the 130 Liberty Street Building Deconstruction Project is accomplished in a safe manner that complies with applicable federal, state and local laws and regulations. In addition, the Contractor is responsible for meeting the various waste management and disposal requirements of the Contract. The Contractor bears overall responsibility for implementing the Deconstruction Project.

The "Environmental Consultant" is a subconsultant of the Contractor and is responsible for providing technical support to the Deconstruction Team relating to regulatory environmental and health and safety aspects of the deconstruction.

The "Abatement Subcontractor" is a subcontractor of the Contractor and is responsible for abating asbestos-containing and contaminated materials within 130 Liberty Street Building from areas included in the Deconstruction Project. The Abatement Subcontractor will conduct a dust clean-up, limited soft strip and interior gut (including, but not limited to suspended ceiling tiles, carpeting, fiberglass insulation, loose cabling/wiring above ceilings and under raised floors, etc.) and removal of ACBM throughout the 130 Liberty Street building in accordance with the Asbestos and COPC Abatement Plan of the Deconstruction Plan. The Abatement Subcontractor is also responsible for proper disposal of wastes generated during these project activities. The "Abatement Subcontractor" shall be a New York State Department of Labor (NYSDOL) and New York City Department of Environmental Protection (NYCDEP) licensed asbestos handler. The Abatement Subcontractor may also have responsibility for handling the certain potentially hazardous and/or regulated miscellaneous building components.

Hazardous waste generated at 130 Liberty during the Deconstruction will list LMDC as the generator. It will be the responsibility of the Contractor to determine the appropriate Treatment, Storage, and Disposal Facility (TSDF) to which the materials will be shipped based on waste profiles**,** subject to the approval of LMDC. In addition LMDC, as the current owner of the property, will file a hazardous waste notification revision with the EPA pursuant to the Resource Conservation and Recovery Act (RCRA).

2. BUILDING COMPONENTS

This Plan has been developed to address the components within the Building that will be cleaned and/or removed during project activities. At this time, the following list of anticipated waste streams has been identified and will be addressed in this Plan:

- Dust
- ACBM
- Deconstruction Waste including:
  - Suspended ceiling tiles and support grid
  - Carpeting
  - Gypsum Wall Board (GWB) and associated metal studs
  - Sprayed-on fireproofing
  - Fiberglass insulation
  - Doors and frames
  - Raised flooring
  - Mechanical Electrical Plumbing (MEP) components (heating, ventilation and air conditioning [HVAC] systems, elevators, plumbing, wiring, etc.)
  - Exterior building components (window and spandrel units, column coverings, louvers, etc.)
  - Exterior mesh/netting currently covering the building façade
  - Concrete and masonry
  - Structural Steel

- Miscellaneous Other Building Related Regulated including:
  - Light ballasts and potting material
  - Lamps
  - Mercury switches
  - Uninterruptible Power Supply (UPS), Exide and other batteries
  - Refrigerants
  - Bagged accumulated waste
  - Fuel
  - Fire extinguishers
  - Halon fire suppression systems

The following sections will outline the proposed steps for further characterization, removal and recycling or disposal of the above-mentioned components. The classification of building components and contents is an ongoing effort and has been and will be conducted in accordance with applicable New York City, New York State and federal laws, rules, and regulations. This Plan is intended as a working document to be used during ongoing operations at the Building and will be updated as necessary as new information becomes available.

3. GENERAL WASTE CHARACTERIZATION STRATEGY

Of the waste types identified above, some will require additional sampling and analysis to determine disposal routing while, for others, sufficient analytical data or other information already exists to determine disposal routing.

The TRC Preliminary Waste Characterization Study indicated the following:

Fourteen representative composite bulk dust (six samples) and anticipated waste stream/building material (eight) samples were collected on various floors of the Building and analyzed for Resource Conservation and Recovery Act (RCRA) Characteristics and full Toxicity Characteristic Leaching Procedure (TCLP) analysis. Results of the 14 samples were compared to criteria provided in 40 CFR Part 261 sections 21 through 24 and Environmental Protection Agency Publication SW 846 Chapter 7. None of the 14 samples collected exceed the criteria provided in 40 CFR Part 261 sections 21 through 23 or SW 846 Chapter 7. None of the eight building material samples exceeded the Maximum Concentration of Contamination for the Toxicity Characteristics provided in 40 CFR section 261.24. One of the six composite bulk dust samples, collected in a mechanical room on the 40th floor, exhibited levels of cadmium that exceeded 40 CFR section 261.24. This sample exceeded the cadmium maximum concentration of 1.0 mg/L with a result of 6.2 mg/L. (Additional sampling will be conducted to determine whether specific equipment or surface coatings in the 40th Floor mechanical room contributed to the cadmium levels.)

In general:

- All waste materials generated in the work areas during the Deconstruction**,** including caulking, polyethylene sheeting, foam sealants, spray adhesive, spent filters, etc. will be disposed of as asbestos waste, at a minimum. (Note that non-porous items decontaminated in accordance with state and local requirements will not be treated as asbestos wastes.)

- Waste generated during the project will be characterized, managed, transported and disposed of in compliance with this Waste Sampling and Management Plan and applicable regulations.

- All dust, including but not limited to WTC dust, will be sampled and further characterized for waste classification relative to other identified contaminants (including COPCs) to determine if it must be handled as a hazardous waste in addition to being

handled as an asbestos waste. In addition, an investigation of painted surfaces/mechanical equipment in the 40th floor mechanical room for the presence of cadmium in paint will be conducted to assess potential contribution of cadmium in paint to the cadmium result in dust for that location as identified in the TRC Preliminary Waste Characterization Study.

- TRC performed supplemental sampling and analysis of representative glass in the Building for the presence of selenium. Selenium was not detected in glass samples analyzed for total and TCLP selenium.

- Dust sampling for hazardous waste characteristics will be performed in advance of sampling of materials impacted by dust. If the dust classification sampling indicates that the dust is not a characteristic hazardous waste, then by extension, any non-hazardous materials potentially impacted by dust (e.g. fireproofing, GWB, carpets) would also not be hazardous. Those materials would then not be sampled for Resource Conservation and Recovery Act (RCRA) characteristics unless there is an independent concern that they might be hazardous waste due to the inherent composition of the component, subcomponent or waste stream (e.g., light ballasts which may contain PCBs, items coated with lead-based paint).

- Porous Deconstruction Waste (including any associated dust remaining on it) will be sampled and tested for waste characterization relative to identified contaminants (COPCs other than asbestos) through the collection of representative bulk and/or core samples of the materials including any settled/entrained dust as described in Section 4.2.3, only if the dust samples described in the above bullet indicate that the bulk dust meets any of the RCRA characteristics. Porous Deconstruction waste will be managed as described in Section 4.2 as well as consistent with any other waste classification that is identified by the analytical results of the waste classification sampling, if needed.

- ACBMs by their nature and definition will be disposed of in accordance with ACM disposal requirements outlined in Section 4 - Asbestos and COPC Abatement and Removal Plan of the Deconstruction Plan. Asbestos-containing materials that are both ACBM and hazardous waste will be managed in accordance with the requirements for both types of waste streams.

- Non-Porous Deconstruction Waste may be managed by either of two options. The Abatement Subcontractor may choose to clean the non-porous surfaces in accordance with procedures outlined in Section 4 - Asbestos and COPC Abatement and Removal Plan of the 130 Liberty Street Deconstruction Plan. The resulting cleaned material will not be sampled unless it is painted; in that instance, sampling will be performed as described in Section 4.3.3 of this Plan. Alternatively, based on field conditions and decisions regarding the use of its labor force, the Abatement Subcontractor may choose to not clean the surfaces and instead manage those uncleaned non-porous materials as asbestos waste at a minimum or otherwise, if required, as determined by the RCRA characteristics sampling.

- Miscellaneous Other Building Related Components can be characterized based on inherent composition and corresponding applicable waste standards.

For materials requiring sampling, a random sampling strategy will be used and composite samples representative of the final waste streams will be collected. The locations and frequency of samples to be combined into composite samples shall be determined by the Environmental Consultant such that a representative sample of the waste type has been obtained. All sampling personnel shall be familiar with sample collection and waste storage protocols and shall have undergone Hazard Communication training in accordance with 29 CFR section 1910.1200 as well as being trained appropriately per the Health and Safety Plan.

The waste classification samples will be sent to a New York State Environmental Laboratory Approval Program (ELAP) certified (6 NYCRR Section 370.1(f)) and qualified laboratory for waste classification analysis (e.g., TCLP and RCRA characteristics) to determine appropriate waste classification and handling requirements (40 CFR section 262.11). Other sampling and laboratory analysis may be required by the disposal facility prior to waste acceptance. The laboratory subcontracted to perform the analysis will be also be certified through the National Environmental Laboratory Accreditation Program (NELAP) for the analytical parameters being analyzed, so there is assurance that the laboratory has passed a nationally recognized quality assurance program that includes audits, analysis of blind performance samples to check data quality and meeting certain minimum technical standards for the qualifications of testing personnel.

Upon receipt of analytical results, determination of waste classification and identification of disposal facilities, the Environmental Consultant will identify applicable regulatory requirements for waste handling, worker training and protection (e.g., specific training/certifications, personal protection equipment [PPE]), packaging (e.g., type of packaging, marking, labeling), transporting (e.g., placarding, shipping papers), waste routing and disposing of these wastes. Since waste classification samples will be collected from in-place materials, on-site storage of deconstruction wastes for waste classification will not be required. Rather, all removed materials will be placed into their applicable disposal containers/vehicles for off-site shipment. All potentially hazardous waste will be managed as hazardous waste until analytics prove otherwise.

Further detail for each of the anticipated categories of waste along with currently identified volume estimates is provided in Attachment 1. Greater detail regarding monthly estimated

quantities of generated regulated hazardous waste will be provided subsequent to detailed waste characterization sampling and analysis.

If greater than 1000 kg/month of hazardous waste is generated during the deconstruction process, Contractor will comply with , among other things, 6 NYCRR Part 373, Subpart 373-3, section 373-3.3(b).

4. WASTE CHARACTERIZATION SPECIFICS

The LMDC retained Berger to conduct an Initial Building Characterization Study for the Building. These results were subsequently presented and discussed in the September 14, 2004 Initial Building Characterization Study Report (Initial Building Characterization). In addition the LMDC retained TRC Environmental Corporation to conduct a preliminary waste characterization in the Building. These results were presented and discussed in the TRC Preliminary Waste Characterization Study (Preliminary Waste Characterization).

In keeping with the procedures utilized during the Initial Building and Preliminary Waste Characterization studies, the Environmental Consultant will divide the Building into six zones for the purposes of waste characteristic sampling:

- Zone 1 - Mechanical Rooms on the 5th, 6th, 40th, and 41st Floors to include the air intakes, fan rooms, and air handling units of the HVAC system. Note, Zone 1 will be further divided into Zones 1A – 5th and 6th floors and Zone 1B – 40th and 41st floors.
- Zone 2 - Office Space located at or below the 24th Floor that may have been subjected to WTC dust entering the Building through an external breach (Gash Area), HVAC system (and possibly circulated through the HVAC system), vertical shafts, or broken windows.
- Zone 3 - Office Space located above the 24th Floor that may have been impacted by WTC dust distributed through the HVAC system, vertical shafts, or broken windows.
- Zone 4 - Gash Area that was cleaned by Deutsche Bank subsequent to September 11, 2001 to permit structural work to be performed.
- Zone 5 - Roof Area that may have been impacted by the settling or adhesion of WTC dust to the exterior surfaces.
- Zone 6 - Exterior Facade building materials.

These zones will be carried through the sampling scheme described in this Plan for wastes that are ubiquitous to the deconstruction activities (e.g., settled dust, ACBM, deconstruction generation waste). For materials that are less prevalent throughout the 130 Liberty Street Building (e.g., transformers, batteries, mercury switches), waste management sampling, if required, will be performed independently, not by zones. Instead, these materials will be segregated, handled, and disposed in accordance with the applicable requirements for each specific material.

4.1. ASBESTOS-CONTAINING/CONTAMINATED WASTE

4.1.1. Definition

The Initial Building Characterization and the TRC *Supplemental Investigation Summary Report – Summary of Results of Additional Asbestos Containing Building Material (ACBM) Inspection* dated February 23, 2005 (Supplemental ACBM Inspection) identified various ACBM materials present in the Building prior to September 11, 2001. These materials are classified as "asbestos material." In addition, the Initial Building Characterization identified settled dust with visible accumulations of less than 0.25 inch throughout the Building in locations such as the top of radiator covers, carpets, concrete floors, door frames, reception desks and HVAC units. Above the suspended ceiling (plenum), visible dust was identified on top of ceiling tiles, ceiling grids, HVAC ductwork, electrical lighting fixtures and sheetrock ceilings.

The results of the Initial Building Characterization indicated that settled dusts had detectable levels of COPCs identified by EPA which included: asbestos, crystalline silica, PAHs, dioxins, PCBs and heavy metals (e.g., barium, beryllium, cadmium, copper, lead, manganese, mercury, nickel and zinc). The concentration of the COPCs found within the settled dust samples varied throughout the Building.

WTC dust impacted materials must be handled as asbestos waste. Therefore, additional waste characterization sampling will not include asbestos as such testing is not necessary since all dust will be treated as asbestos waste**.** Instead, additional waste characterization testing will include analysis for TCLP and RCRA characteristics of ignitability, corrosivity, reactivity, and toxicity to determine if these materials must be managed as hazardous wastes as well as asbestos waste.

All potentially hazardous waste will be managed as hazardous waste unless analytics prove otherwise. If results of waste characterization sampling and analysis dictate that waste material must be managed and disposed of as both an asbestos and a hazardous waste, both asbestos and hazardous waste management and disposal requirements will be met. If there are conflicts between the requirements for asbestos and hazardous waste that preclude compliance with both, then the hazardous waste requirements will dictate specific management and disposal requirements.

4.1.2. Components

Settled dust, materials impacted by WTC dust, and ACBMs comprise the waste streams that will be handled as asbestos at the Site.

4.1.2.1 Settled Dust

The Contractor will manage the disposal of all settled dust and materials impacted by dust as asbestos waste, at a minimum. As part of the waste characterization process and prior to collection of waste classification samples from building materials impacted by settled dust, additional samples of the settled dust will be collected throughout the Building to determine the proper waste disposal options. Sample analysis will be limited to RCRA characteristics (including TCLP) and exclude asbestos.

As one composite TCLP dust sample collected on the 40th floor mechanical floor exhibited a concentration of cadmium that exceeded 40 CFR section 261.24, focused testing is warranted in this area. Zone 1 sampling will be further segregated into Zone 1A specific to Mechanical floors 5/6 and Zone 1B specific to Mechanical floors 40/41. In addition, an investigation with paint chip sampling for cadmium analysis will be performed on the 40th floor to assess potential contribution of cadmium in painted surfaces/mechanical equipment to the elevated cadmium result identified in the TRC Preliminary Waste Characterization Study. This additional testing will be completed prior to any abatement work on the 40th floor. Upon receipt of the sample data, it will be determined whether the dust in the 40th floor mechanical room will be disposed of as asbestos waste only or as an asbestos and hazardous waste for chromium (or other hazardous waste classification).

Analytical results for RCRA characteristics will be used to determine if the dust in an area is non-hazardous or must also be classified and subsequently managed as hazardous waste due to the influence of other COPCs.

4.1.2.2 Pre-September 11, 2001 Asbestos-Containing Building Materials

The Initial Building Characterization and Supplemental ACBM Inspection studies performed sampling of suspect ACBM found within the Building. The results of these studies indicate the majority of the building material samples tested negative for asbestos or were not asbestos containing material by regulation, including spray-on fire-proofing, wallboard, roofing materials, fire doors and most thermal insulation for piping and ducts. Other building materials tested and listed below contained greater than one percent asbestos and are considered ACMs by regulation. Refer to the Asbestos and COPC Abatement Plan for quantities and locations.

- Floor tiles
- Sealant at cable entrances
- Mastic
- Thermal pipe insulation
- Transite wallboard
- Linoleum flooring and mastic
- Pipe insulation (various sizes)
- HVAC duct joint caulking
- Window caulking material
- Wall and joint tar paper
- Transite wall material
- Wall insulation material
- Baseboard mastic
- Sealant material over weather stripping
- Exterior caulking materials

Since these building materials have previously been determined to contain asbestos at greater than one percent by weight, the Contractor will manage these wastes as asbestos waste, at a minimum.

If settled dust sample results collected from an ACBM indicate the dust also will be classified as RCRA characteristic waste (in addition to as asbestos waste**)**, then waste classification samples will be collected from impacted ACBM for analysis of RCRA characteristics**,** that were detected above regulatory limits in the dust. The results of the bulk ACBM waste classification samples

will be used to determine if the ACBM must also be classified and subsequently managed as hazardous waste.

Should the Contractor or Subcontractors come upon any materials for which proper material sampling does not exist, the Owner, Contractor and Environmental Consultant shall be immediately contacted to arrange for appropriate testing.

4.1.3. Analytical Methods and Sample Collection Frequency

The sampling strategy for each main category of asbestos-containing/contaminated material will be described in the following subsections of this Plan.

Analytical methods for the RCRA waste characteristics are as follows. Where more than one method is identified, each analytical method is valid per the regulations. All allowable methods are included in this plan to allow for flexibility in selecting an analytical laboratory(ies).

- The characteristic of ignitability carries the RCRA waste code of D001, and may be analyzed for using American Society of Testing Materials (ASTM) method D-93-79 or D-93-80 or D-3278-78.

- The characteristic of corrosivity carries the RCRA waste code of D002, and may be analyzed using Method 9045C as set forth in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. SW-846 method 9040 (whether B or C) is for aqueous wastes and multiphase waste where the aqueous phase constitutes at least 20% of the total volume of the waste; 9045C is for soils and waste samples where the waste may be solids, sludges, or non-aqueous liquids. The aqueous phase must be less than 20% of the total volume of the waste.

- The characteristic of reactivity carries the RCRA waste code of D003, and may be analyzed using the analytical methods outlined in sections 7.3.3.2 or 7.3.4.2 of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. The referenced sections are from SW-846 Chapter Seven: Characteristics Introduction and Regulatory Definitions. They are specifically for Reactivity. Chapter Seven was revised to reflect the withdrawal of the reactive cyanide and sulfide guidance in sections 7.3.3 ("Interim Guidance for Reactive Cyanide") and 7.3.4 ("Interim Guidance for Reactive Sulfide"), and to replace certain characteristic explanatory text with referrals to the regulations themselves. This change can be found in the Proposed Update IIIB to SW-846.

- The characteristics of toxicity carry the RCRA waste codes of D004 through D043. Each waste code identifies the specific chemical component for which the waste is classified as toxic. The samples to be analyzed for the characteristic of toxicity must be prepared

using the Toxicity Characteristic Leaching Procedures (TCLP) per Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. The analytical method applied to the resulting leachate depends on the type of chemical being analyzed for, as follows:

- Volatile organic compound (VOC) toxic constituents will be analyzed by Method 8260B of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. VOC toxic constituents include benzene (D018), carbon tetrachloride (D019), chlorobenzene (D021), chloroform (D022), 1,4-dichlorobenzene (D027), 1,2-dichloroethane (D028), 1,1-dichloroethylene (D029), methyl ethyl ketone (D035), tetrachloroethylene (D039), trichloroethylene (D040), and vinyl chloride (D043).

- Semivolatile organic compound (SVOC) toxic constituents will be analyzed by Method 8270C of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. SVOC toxic constituents include 2,4-dinitrotoluene (D030), hexachlorobenzene (D032), hexachlorobutadiene (D033), hexachloroethane (D034), o-cresol (D023), m-cresol (D024), p-cresol (D025), cresol (D026), nitrobenzene (D036), pentachlorophenol (D037), pyridine (D038), 2,4,5-trichlorophenol (D041), and 2,4,6-trichlorophenol (D042).

- Pesticide toxic constituents will be analyzed by Method 8081A of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Pesticide toxic constituents include chlordane (D020), endrin (D012), heptachlor and its epoxide (D031), lindane (D013), methoxychlor (D014), and toxaphene (D015).

- Herbicide toxic constituents will be analyzed by Method 8151A of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. Herbicide toxic constituents include 2,4-D (D016) and 2,4,5-TP (also known as Silvex, D017).

- Mercury (D009) will be analyzed by Method 7470A (aqueous samples) of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.

- Metals/inorganics other than mercury will be analyzed by Method 6010B of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846. These constituents include arsenic (D004), barium (D005), cadmium (D006), chromium (D007), lead (D008), selenium (D010), and silver (D011).

Generally, building components would not be considered as possible RCRA characteristic wastes except for the potential that exists due to impacts by WTC dust. The notable exceptions to this would be painted surfaces, which would typically be sampled for TCLP lead, cadmium and chromium analysis as well as miscellaneous materials containing hazardous components prior to WTC impact (such as transformers, ballasts, lamps, etc.).

The results of RCRA characteristic analyses, the classification of the material based on historical information, as well as the material's status as presumptively asbestos-contaminated, will be used as the basis for the Waste Profile for the particular waste stream.

4.1.3.1 Waste Characteristics Sampling Frequency for Settled Dust

Three composite samples of the dust will be collected from within each zone (Zone 1A, 1B, Zone 2, Zone 3, and Zone 4 only) as identified in Section 4, above. Each composite sample will consist of, at a minimum of four grab samples per composite, but the number of grab samples may increase based on field conditions. The composite samples will be analyzed for all RCRA characteristics as identified in Section 4.1.3 of this Plan to determine if the dust must be managed as RCRA waste (as well as asbestos waste).

The Environmental Consultant will collect composite samples that are representative of the settled dust. The representative composite samples will consist of a minimum of 400 grams of material to provide adequate sample size necessary for chemical analysis.

In addition to dust sampling, paint chip sampling of painted surfaces for cadmium analysis will be performed on the 40th floor to assess potential contribution of cadmium in painted surfaces/mechanical equipment to the elevated cadmium result identified in the Preliminary Waste Characterization Study. Paint chip samples will be collected and submitted to a certified independent laboratory for analysis.

A unique sample identifier for each sample along with requested analytical parameters will be tracked and recorded using a Chain-of-Custody (COC) form. Sample management, labeling and quality assurance/quality control (QA/QC) procedures are outlined in Attachment 2 to this Plan.

4.1.3.2 Waste Characteristics Sampling Frequency for Asbestos-Containing Building Materials

Waste classification samples for RCRA characteristics of ACBM will only be collected if the analytical sampling results for the dust samples indicate that the dust exceeds the regulatory limits for RCRA characteristic waste or there is another reason to suspect the ACBM is hazardous (i.e. painted with suspected lead-based paint). In those instances, the sample analysis will be limited to only those RCRA characteristics identified in the dust or otherwise suspected.

For porous distinct ACBM identified in the previous studies (e.g., sealant at cable entrances, mastic, thermal pipe insulation, and mastic, pipe insulation, HVAC duct joint caulking, window caulking material, wall and joint tar paper, wall insulation material, sealant material over weather stripping, and exterior caulking material), three composite samples will be collected from within each zone (Zone 1, Zone 2, Zone 3, and Zone 4 only) as identified in Section 4, above. Each composite sample will consist of a minimum of four grab samples; however, the number of grab samples per composite may be increased based on field conditions. Each grab sample will consist of a bulk or core sample that collects both the ACBM and any entrained dust. The samples will be analyzed for RCRA characteristics as identified in Section 4.1.3 of this Plan to determine if these materials must be managed as RCRA waste (in addition to being managed as asbestos waste).

The Environmental Consultant will collect composite samples that are representative of each type of ACBM. The representative composite samples will consist of a minimum of 400 grams of material to provide adequate sample size necessary for chemical analysis. A unique sample identifier for each sample along with requested analytical parameters will be tracked and recorded using a COC form.

4.1.4. Disposal.

4.1.4.1 Settled Dust and Materials Impacted by WTC Dust

Settled dust**,** and materials presumed to have been impacted by WTC dust, will be managed as asbestos waste, at a minimum. Should results of the waste classification sampling described in Section 4.1.3 and 4.1.3.1 of this Plan indicate that the waste classification sample results exceed the regulatory threshold for one or more RCRA characteristics, the dust represented by the sample(s) that exceeded the threshold(s)**,** as well as materials impacted by such dust, will be managed as both a RCRA waste of the appropriate waste code and asbestos waste. Potential disposal facilities are identified in Section 7 of this Plan. All final disposal facilities must be approved by the Owner before waste is shipped.

Representative TCLP testing of the dust in the 40th floor Mechanical room will occur prior to disposal. Until results of that additional sampling and analysis are available, the dust in the 40th

Floor Mechanical room will be presumed hazardous for cadmium, in addition to being an asbestos waste.

4.1.4.2 Asbestos-Containing Building Material

As part of the Deconstruction Project, a New York State Licensed Asbestos Abatement Contractor, prior to building demolition, will remove the ACBM identified throughout the Building. All ACBM will be removed, packaged, transported, and disposed of in accordance with the Asbestos Abatement Plan.

Should results of the waste classification sampling described in Section 4.1.3 and 4.1.3.2 of this Plan indicate that the waste classification sample results exceed the regulatory threshold for one or more RCRA characteristics, the waste stream represented by the sample that exceeded the threshold will be managed as both a RCRA waste of the appropriate waste code, as well as asbestos waste.

The disposal of all removed ACBM will be at an approved, licensed and permitted asbestos landfill. Potential disposal facilities are identified in Section 7 of this Plan. All final disposal facilities must be approved by the Owner before waste is shipped.

4.2. Porous Deconstruction Waste

4.2.1. Identification

Porous deconstruction wastes are those interior building components that have porous surfaces and that have not been identified as ACBM. In addition,exterior netting removed during Preparation Phase activities is included in the porous deconstruction waste category.

4.2.2. Components

At this time, the following Porous Deconstruction waste streams have been identified as being associated with the deconstruction process:

- Suspended ceiling tiles
- Carpeting
- Fiberglass Insulation

- GWB
- Sprayed-on fireproofing
- Exterior mesh/netting currently covering the building façade

All porous materials will be disposed of as asbestos waste at a minimum. Should results of the waste classification sampling indicate that a porous material exceeds the regulatory threshold for one or more RCRA characteristics, the porous materials that exceeded the threshold(s) will be managed as both a RCRA waste of the appropriate waste code and asbestos waste. If sample results indicate RCRA characteristics in excess of regulatory requirements for disposal as asbestos waste, then further characterization for segregation of the porous materials will be performed. Exterior mesh/netting will require characterization prior to disposal. Representative samples of the mesh/netting will be collected and analyzed for RCRA, TCLP characteristics and asbestos. The results of the sampling will determine the final disposition of the material.

4.2.3. Porous Deconstruction Waste Sampling Frequency

Waste classification samples of Porous Deconstruction Waste for RCRA characteristics will only be collected if the analytical sampling results for the dust samples indicate that the dusts exceeded the regulatory limits for RCRA characteristic waste. In that instance, only those RCRA characteristics identified in the dust will be analyzed for in the samples collected from the porous deconstruction waste/dust matrix.

The Environmental Consultant will collect composite samples that are representative of each type of porous deconstruction generated waste. The representative composite samples will consist of a minimum of 400 grams of material to provide adequate sample size necessary for chemical analysis. A unique sample identifier for each sample along with requested analytical parameters will be tracked and recorded using a COC form.

Sampling frequencies for each porous deconstruction waste stream are described in the following sections.

4.2.3.1 Waste Sampling Frequency for Suspended Ceiling Tiles, Gypsum Wallboard, Carpeting and Fiberglass Insulation

For each of these materials (suspended ceiling tiles, carpeting and fiberglass insulation), three composite samples will be collected from within each zone (Zone 1, Zone 2, Zone 3, and Zone 4 only) as identified in Section 4 above. Each composite sample will consist of a minimum of four grab samples; however, the number of grab samples per composite may be increased based on

field conditions. Each grab sample will consist of a bulk sample that collects both the porous deconstruction waste and any entrained dust on/in the porous deconstruction waste.

4.2.3.2 Waste Sampling Frequency for Sprayed-on Fireproofing

The fireproofing will be managed as asbestos waste without additional sampling, unless bulk dust samples indicate the dust exceeds one or several RCRA characteristics. In that instance, three composite samples will be collected from within each zone (Zone 1, Zone 2, Zone 3, and Zone 4 only) as identified in Section 4 above. Each composite sample will consist of a minimum of four grab samples; however, the number of grab samples per composite may be increased based on field conditions. Each grab sample will consist of a bulk sample that collects both the dust and the spray-on fireproofing; analysis will be limited to those RCRA characteristic(s) that were determined to be of concern in the bulk dust samples.

4.2.3.3 Waste Sampling Frequency for Exterior Mesh/Netting

Waste classification samples will be collected from the netting for both RCRA characteristics and asbestos. One composite sample, comprised of a minimum of four grab samples, will be collected from three of the cardinal directions (north face, east face, and west face) of the building, excluding the south face where there is no netting. Each grab sample will be collected from the ground-floor level. The results of the RCRA characteristic and asbestos analysis would establish the anticipated disposal conditions for the netting removed as part of the Deconstruction.

4.2.4. Disposal

As described above, the suspended ceiling tiles, carpeting, gypsum wall board, sprayed on fireproofing, exterior netting, and fiberglass insulation will be disposed of as asbestos waste unless RCRA characterization sampling (if required based on dust sample results) indicates that the material must be managed as RCRA hazardous. If the material is determined to be RCRA hazardous, then it will be handled, packaged, labeled, transported, and disposed of in accordance with appropriate regulatory requirements determined to apply to the waste.

The waste stream(s) (except decontaminated non-porous materials) will be managed as asbestos waste, and material will be removed, packaged, transported and disposed of in accordance with the Asbestos and COPC Abatement Plan, New York State and New York City Regulations, and relevant variances. All removed porous building materials will be disposed at an approved, licensed and permitted asbestos landfill. Potential disposal facilities are identified in Section 7 of this Plan. All final disposal facilities must be approved by LMDC before waste is shipped.

4.3. NON-POROUS DECONSTRUCTION WASTE

4.3.1. Characterization/Identification

Non-porous building materials, by definition, will not have WTC dust entrained within the material matrix. Therefore, if non-porous building materials are sufficiently wet-wiped/HEPA vacuumed in accordance with the Asbestos and COPC Abatement Plan to remove dust, this material would not be classified as asbestos waste. By extension, if dust is removed, any COPCs associated with WTC dust will also be removed, thereby eliminating the need to perform waste sampling for RCRA characteristics associated with WTC dust. For non-porous deconstruction waste, only those components that are painted and not recycled (i.e. disposed) will be sampled; the samples will be analyzed for the RCRA characteristic of TCLP lead, cadmium, and chromium to determine if the painted surfaces would cause the material to be classified as RCRA hazardous.

In addition, TRC collected nine (9) TCLP for selenium and three (3) total selenium samples of glass at 130 Liberty Street. Glass included tinted vision glass, spandrel glass and plate glass. Selenium was not detected in any of the twelve (12) glass samples analyzed.

If the Abatement Subcontractor chooses to dispose of non-porous deconstruction waste without first wet-wiping/HEPA vacuuming, then the non-porous deconstruction waste would be classified as asbestos waste as discussed above. In that case, the material waste would also have to be classified and managed based on the settled dust RCRA characterization results due to the fact that the dust will remain on its surface; however, the core material itself need not be tested as, due to its non-porous nature, the dust will not have impacted the matrix of the material/component. The results of RCRA characteristic analyses as well as the unabated

material's status as asbestos waste will be used as the basis for the Waste Profile for the particular waste stream.

4.3.2. Components

At this time, the following non-porous deconstruction waste streams have been identified as being associated with the deconstruction process:

- Raised flooring
- MEP components (HVAC duct, plumbing, conduit, wiring, etc.)
- Doors and door frames
- Suspended ceiling support tracking/grid
- Exterior building components - window and spandrel units, column covers and fascia, louvers, etc.
- Structural Steel

4.3.3. Analytical Methods and Sample Collection Frequency

For cleaned (wet-wiped/HEPA-vacuumed) non-porous deconstruction waste, samples will not be collected unless the non-porous components are painted and to be disposed of. Cleaned painted scrap metals that are recycled are exempt from the below described waste characterization sampling and analysis. For non-porous components that are painted, one composite sample made up of a minimum of four grab samples of each distinct painted non-porous building component (based on paint color, building component type and zone in which the component is located) will be collected for RCRA lead, chromium and cadmium analysis. Each grab sample will be collected as a core sample (i.e., both painted surface and building component matrix) and sent to the lab under COC for analysis.

4.3.4. Disposal

Cleaned, unpainted, non-porous deconstruction waste will be classified, managed and recycled/disposed of as non-hazardous construction and demolition (C&D) debris. Likewise, cleaned, painted, non-porous deconstruction waste with TCLP lead, chromium and cadmium

results of less than applicable standards would also be classified, managed and recycled/disposed of as non-hazardous C&D debris.

Cleaned, painted, non-porous deconstruction waste with TCLP lead, chromium and cadmium results greater than applicable standards would be classified, managed and disposed of as hazardous waste with the toxicity characteristic of lead, chromium and/or cadmium.

Non-cleaned, non-porous deconstruction waste will be disposed of as asbestos waste at a minimum for the reasons indicated previously. Should results of the settled dust classification sampling indicate that the dust results exceed the regulatory threshold for one or more RCRA characteristics, the waste will be managed as both a RCRA waste of the appropriate waste code as well as asbestos waste.

Potential disposal facilities are identified in Section 7 of this Plan subject to approval by LMDC prior to usage**.**

4.4. MISCELLANEOUS BUILDING COMPONENTS

4.4.1. Definition/Characterization

Miscellaneous building components, as listed in Section 2 above have been identified throughout various portions of the Building. Prior to the commencement of the Deconstruction activities, the Environmental Consultant will conduct a detailed survey of the Building to confirm that the current inventory is complete and accurate and to determine/classify Miscellaneous Building Components contained in the Building.

All characterization information obtained during the detailed survey will be documented in a spreadsheet. This spreadsheet will include an inventory by major category and will be used to help determine sampling requirements, specific handling requirements (including applicable worker training and/ or licensing requirements), disposal classification, disposal status and disposal procedure.

With few exceptions, as noted below, these components will not require any additional characterization prior to handling, packaging, removal and/or disposal. Instead, these materials can be classified based upon their inherent composition. Based on the treatment of the settled

dust as an asbestos waste, the non-porous miscellaneous building components may be cleaned (wet-wiped/HEPA vacuumed) prior to disposal.

Any material classified as "unknown" during the survey will require sample collection and analysis for full RCRA characteristics in accordance with 40 CFR Part 261 (as described in Section 4.1.3 of this Plan) and will be disposed of based upon the results of that sampling and the nature of the waste. If the material is classified as RCRA hazardous waste, additional sampling may be required for "total" concentrations of specific contaminants to determine whether the waste may be land filled or is "land banned"; the contaminants to be analyzed for will depend on the specific waste classification of the waste.

Further detail on the anticipated materials is provided below.

4.4.2. Components

4.4.2.1 PCB Light Ballasts and other PCB Wastes

4.4.2.1.1 Definition

PCBs are a family of man-made chemical compounds that do not exist in nature, but are manufactured by the replacement of hydrogen atoms on the biphenyl molecule by chlorine. Because of their physical properties, PCBs are commonly found in electrical equipment that requires dielectric fluid such as transformers and capacitors as well as hydraulic machinery, vacuum pumps, compressors and heat exchanger fluids. Other uses include fluorescent lighting ballasts.

4.4.2.1.2 Characterization/Analytical Method

During deconstruction activities, as ballasts are removed from lighting fixtures, the Abatement Subcontractor shall clean the surfaces of dust and containerize ballasts for disposal as PCB waste. All ballasts, including those labeled "No PCB" will be containerized for disposal as PCB waste due to the presence of potting material. For potentially PCB-containing equipment other than ballasts, PCB samples may be required to determine whether the dielectric fluid contains more than 50 parts per million (ppm) PCBs, which would make the equipment subject to the

PCB regulations. SW-846 Method 8082, Analysis of Polychlorinated Biphenyls by Gas Chromatography is specified by regulation for determining the concentration of PCBs in wastes.

4.4.2.1.3 Components

Materials that have the potential to be PCB-containing (e.g., electric oil-filled switches, transformers, capacitors, etc.) will be tested for PCB concentration. If 50 ppm or more PCBs are detected in the waste stream the materials will be classified as both federal Toxic Substances Control Act (TSCA) waste and New York State hazardous waste. Potential PCB wastes will be sampled in accordance with TSCA (40 CFR Part 761). At the time this Plan was being developed it was not possible to determine the number of samples to be collected since the detailed waste survey has not yet been performed.

4.4.2.1.4 Disposal

Ballasts (all assumed to contain PCBs) shall be handled, packaged and labeled as required for disposal as a PCB regulated waste. All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

Shipments of PCB waste must be in properly labeled and marked containers, the waste must be shipped under a properly executed manifest and Land Disposal Restriction (LDR) form, the transporter must have a valid EPA Identification number and must have a valid New York State Part 364 transporter permit as well as the latest version of U.S. Department of Transportation's Emergency Response Guide (2004). The vehicle in which PCB wastes are being shipped must be properly placarded and marked to reflect that it is transporting PCBs and must also be marked with the New York State waste transporter permit number on its sides and rear.

Disposal facilities that accept PCB wastes must have an EPA Identification number and have received TSCA authorization from the EPA and any additional state permits for the disposal/management of PCBs applicable to the state in which the facility is located. The disposal facility must comply with all manifesting requirements specified in the regulations and must prepare a certificate of destruction and send it to the generator or the generator's agent.

For fluids sampled, wastes containing less than 50 ppm PCBs are generally not considered PCB wastes and would therefore not be classified as TSCA waste nor would they be classified as New York hazardous waste unless they were classified as a hazardous waste for a component other than PCBs. Electrical equipment containing 50 ppm or more but less than 500 ppm PCBs is considered PCB-contaminated electrical equipment. Electrical equipment containing 500 ppm or more PCBs is considered PCB equipment. The waste disposal options available depend on the type of equipment and the PCB concentration found in the equipment.

Once the presence/absence of PCBs has been confirmed, the specific disposal requirements for the equipment based on the concentration and equipment type will be identified. Disposal will be consistent with the regulations set forth at Title 40 Code of Federal Regulations Part 761 (40 CFR Part 761) and Title 6 New York Code of Rules and Regulations Chapter 371.4(e) [6 NYCRR Section 371.4(e)].

4.4.2.2 Universal Waste

4.4.2.2.1 Definition

40 CFR Part 273 and 6 NYCRR Section 374.3 establish requirements for managing universal wastes. Universal wastes are those wastes that would reasonably be expected to be classified as hazardous wastes but, due to their universal use in industrial and residential properties, regulations were created that would ensure that they were managed in a manner that prevented harm to the environment while reducing the regulatory burden on generators of these wastes.

Universal wastes include the following waste types:

(1) Batteries as described in 40 CFR section 273.2 and 6 NYCRR Section 374-3.1(b)

(2) Pesticides as described in 40 CFR section 273.3 and 6 NYCRR Section 374-3.1(c)

(3) Thermostats as described in 40 CFR section 273.4 and 6 NYCRR Section 374-3.1(d)

(4) Lamps as described in 40 CFR section 273.5 and 6 NYCRR Section 374-3.1(e)

It is assumed that pesticides will not be generated during the 130 Liberty deconstruction project; the requirements for mercury switches and batteries will be discussed in the following sections.

It should be noted that universal waste may be managed according to hazardous waste regulations; however, it is assumed that all materials that are eligible for management as either universal wastes or hazardous waste will be managed as universal waste.

4.4.2.2.2 Analytical Method

Per the universal waste regulations, analytical testing is not required to determine classification as universal waste.

4.4.2.2.3 Disposal

All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

Anyone who generates universal waste is either classified as a large-quantity handler of universal waste (accumulates 5,000 kilograms or more aggregate of all universal waste at any one time) or a small-quantity handler of universal waste (accumulates less than 5,000 kilograms of universal waste). Prior to accumulating 5,000 kilograms of universal waste at any given facility/location, written notification must be sent to the EPA to apply for an EPA hazardous waste identification number. Universal waste handlers may only send or transport universal waste to another universal waste handler or to a destination facility permitted to accept that specific type of universal waste. 40 CFR Part 273 and 6 NYCRR Section 374-3 establish the specific storage, management, shipping and recordkeeping requirements for universal waste.

4.4.2.3 Universal Waste –Lamps

4.4.2.3.1 Definition

See Section 4.4.2.2.1 of this Plan.

4.4.2.3.2 Components

Anticipated lamp types generated during the 130 Liberty Street Building Deconstruction Project include fluorescent lamps, neon lamps, high-pressure sodium lamps, mercury vapor lamps and metal halide lamps.

4.4.2.3.3 Disposal

All collected lamps shall be handled, packaged and labeled as required for disposal as a universal waste. All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

4.4.2.4 Universal Waste – Thermostat Mercury Switches

4.4.2.4.1 Definition

See Section 4.4.2.2.1 of this Plan.

4.4.2.4.2 Components

Mercury switches are commonly used in thermostats. Mercury-bearing switches use mercury as an electrically conductive switching mechanism in electrical system components.

4.4.2.4.3 Analytical Method

Per the universal waste regulations, analytical testing for thermostats is not required to determine classification as universal waste. A hazardous waste determination shall be made for all non-thermostat mercury switches prior to disposal.

4.4.2.3.4 Disposal

All collected thermostat mercury switches shall be handled, packaged and labeled as required for disposal as universal waste. All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

Anyone who generates universal waste is either classified as a large-quantity handler of universal waste or a small-quantity handler of universal waste. Prior to accumulating 5,000 kilograms of universal waste at any given facility/location and thus changing from small-quantity handler to large-quantity handler classification, written notification must be sent to the EPA to apply for an EPA hazardous waste identification number. Universal waste handlers may only send or transport universal waste to another universal waste handler or to a destination facility permitted to accept that specific type of universal waste. 40 CFR Part 273 and 6 NYCRR Section 374-3

establish the specific storage, management, shipping and recordkeeping requirements for universal waste.

4.4.2.5 Universal Waste - Batteries

4.4.2.5.1 Definition

See Section 4.4.2.2.1 of this Plan.

4.4.2.5.2 Components

Anticipated battery types generated during the 130 Liberty Street Building Deconstruction Project include lead acid batteries, nickel cadmium (NiCad) batteries, lithium batteries and silver oxide batteries as well as any other batteries present in the building.

4.4.2.5.3 Analytical Method

Per the universal waste regulations, analytical testing is not required to determine classification as universal waste.

4.4.2.5.4 Disposal

All collected batteries shall be handled, packaged and labeled as required for disposal as a universal waste. All hauler, transportation and disposal facility requirements shall also conform to the requirements for this category of waste.

Anyone who generates universal wastes is either classified as a large-quantity handler of universal waste or a small-quantity handler of universal waste. Prior to accumulating 5,000 kilograms of universal waste at any given facility/location, written notification must be sent to the EPA to apply for an EPA hazardous waste identification number. Universal waste handlers may only send or transport universal waste to another universal waste handler or to a destination facility permitted to accept that specific type of universal waste. 40 CFR Part 273 and 6 NYCRR Section 374-3 establish the specific storage, management, shipping and recordkeeping requirements for universal waste.

4.4.2.6 Used Oil

Used oil must be collected, stored, managed and disposed of in accordance with the regulations found at 6 NYCRR Section 374-2, Standards for the Management of Used Oil

4.4.2.7 Refrigerant-Containing Equipment

Non-hazardous construction and demolition materials may contain regulated refrigerant including, but not limited to, possible refrigerant in the air conditioning and refrigeration systems. The refrigerant will be removed prior to disposal. Material would be considered an appliance and is excluded from definition of C&D debris. For refrigerant-containing equipment the following procedures shall be followed:

- Verify refrigerant has been removed. If not, a licensed refrigerant removal service must be called to properly dispose of refrigerant.
- Equipment that contains refrigerant and will be staged in a clearly demarcated on-site area until the refrigerant has been removed by a licensed refrigerant removal service.
- Remove door on refrigerators and freezers.

4.4.2.8 Bagged Accumulated Waste

The building currently contains miscellaneous bagged accumulated waste, primarily associated with previous studies conducted by the previous building owner and its insurers, as well as decontamination chamber and spandrel glass removal generated waste. These materials will be disposed of as asbestos-containing wastes.

4.4.2.9 Diesel Fuel

Diesel fuel need not necessarily be viewed as a waste. Any remaining diesel fuel may be used to run equipment on site. If not used on site, other recycling opportunities will be explored. If the diesel fuel is to be transported off site as waste, it must be handled, packaged, hauled, transported and recycled as regulated oily non-hazardous material.

4.4.2.10 Fire Extinguishers

If discharged, spent fire extinguishers can be treated as normal C&D debris. If fire extinguishers have not been discharged, the manufacturer of the fire extinguisher should be contacted for the proper discharge and disposal method. Alternately, local fire department(s) may be contacted to determine if they would like to use the fire extinguishers in volunteer or community training exercises.

4.4.2.11 Halon Fire Suppression Systems

This information serves as guidance, but may need to be reevaluated prior to recovery and management of Halon from the fire suppression systems in the 130 Liberty Street Building.

4.4.2.11.1 Definition

Halon is the manufacturer's registered name for a class of low-molecular weight halogenated organic compounds that have been classified by EPA as Ozone Depleting Substances (ODSs). Specifically, Halon-1211, Halon-1301, and Halon-2402 are identified as Group II ODSs in the Clean Air Act. Under the Clean Air Act, venting refrigerant ODSs is prohibited. These types of materials must be recycled to the maximum extent possible. Although Halon in a fire suppression system is not classified as a refrigerant, and thus is not included in the prohibition, these materials should be managed in a way consistent with refrigerants of similar chemical composition.

4.4.2.11.2 Characterization/Analytical Method

Analytical sampling for disposal parameters is not necessary since any recovered Halon will be recycled. Characterization of the specific Halon formulation will be performed by obtaining information from the existing Halon fire suppression system within the 130 Liberty Street Building.

4.4.2.11.3 Components

Halon may be present in two forms: (1) within cylinders connected to the fire suppression piping systems, and (2) dispersed throughout the piping systems. A determination will have to be made

as to whether the fire suppression system meets the regulatory definition of high-pressure or low-pressure system to determine the certification requirements for the technician who will be contracted to recover the Halon from the system. The Contractor must assure that an EPA-certified technician, with the appropriate level of certification for the system, will be utilized for recovery and management of Halon from the fire suppression system.

4.4.2.11.4 Disposal

Since recovered Halon may not be released to the atmosphere and hazardous materials disposal facilities are prohibited from accepting pressurized gases, management of recovered Halon must be through direct recycling or reclamation. Refrigerants may only be sold to certified technicians and only EPA-certified reclaimers are permitted to reclaim recovered ODSs. Reclaimers must return the ODSs to the purity level specified in the applicable American Refrigerant Institute Standards, at which point they may sell the reclaimed material to an EPA-certified technician.

Unused Halon removed from the fire suppression system in their original cylinders may be sold to EPA-certified technicians or may be managed/reclaimed by an EPA-certified reclaimer as a method of disposal. Halon recovered from the fire suppression system shall be managed through an EPA-certified reclaimer as a method of disposal.

4.4.2.12 Miscellaneous Stored Containers

4.4.2.12.1 Background/Definition

No miscellaneous stored containers have been identified within the building. However, if containers of materials are encountered during the course of work, arrangements will be made to have these materials packaged, labeled, and marked by waste classification in accordance with appropriate RCRA and both New York State Department of Transportation (DOT) and U.S. DOT requirements. These items will be "lab packed" or alternatively transferred to larger containers with other similar wastes per waste classification in preparation for transportation.

4.4.2.12.2 Characterization/Analytical Method

Initial characterization may be identified by reviewing any existing labels and/or Material Safety Data Sheets (MSDSs) for each identified material if they can be obtained. Specific requirements beyond initial characterization are found in the applicable federal, state and city solid and hazardous waste and DOT regulations. The specific regulatory programs applicable to specific waste types have not yet been determined since the detailed waste survey has not yet been conducted.

4.4.2.12.3 Components

Components of the Miscellaneous Stored Containers of Product and/or Waste category include antifreeze, cleaning solutions, paint, corrosion inhibitor, neutralizing acid, coolant, water treatment, oxidizer, joint compound, absorbent material and other various materials which may be found in the building that do not fit into the other defined waste categories as described within this Plan.

4.4.2.12.4 Disposal

The identified materials will be handled, packaged, labeled transported and disposed of in accordance with the appropriate regulatory requirements for the waste type determined to apply to that waste stream. A generator who transports or offers for transportation hazardous waste for off-site treatment, storage or disposal must prepare a hazardous waste manifest. Non-hazardous wastes must be shipped under a shipping paper. Items that are "lab packed" are often sent to a permitted incinerator or another approved treatment, storage and disposal facility (TSDF) for disposal

5. STORAGE

An enclosed, locked area will be maintained on site for the storage of waste material prior to off-site disposal. Waste streams will be separated and stored as described below. The waste storage area will be enclosed and located away from the point of waste generation. Incompatible wastes will not be stored next to each other. Containers or incompatible wastes will be segregated. All containers in the waste storage area will have proper labeling, which included information such as waste type and accumulation start date. Weekly inspections will be conducted to confirm that containers are properly stored. The condition of each individual container, any secondary

containment within the storage area, and posted signs will be inspected. Each inspection will be documented on a weekly inspection log to demonstrate compliance.

5.1. Hazardous Waste

Hazardous waste will be placed in containers (e.g., USDOT approved drums, bags, roll-off containers) and transferred to the waste storage area prior to off-site disposal. Drums will be closed at all times during storage, except when waste is added or removed. Drums will be stored in manner to prevent ruptures or leaks in the waste storage area. Containers will be inspected to ensure containers are not over packed or leaking.

Hazardous waste may be kept in the waste storage area for up to 90 days from the accumulation start date. If the generator status should change from large quantity generator to small quantity generator, then up to 13,200 pounds of waste may be stored in the waste storage area for up to 180 days from the accumulation start date.

5.2. Universal Waste

Universal waste will be placed in containers and stored in the waste storage area prior to transport to the off-site disposal facility. Duration of accumulation of universal waste shall not exceed one year after the accumulation start date documented on the container.

5.3. Asbestos

Waste containing asbestos will be wet down to prevent visible emissions of asbestos dust into the air. The asbestos waste will be sealed while wet in a leak-tight container. A supply of leak tight containers will be kept in the waste storage area to provide adequate repackaging if a break in the container should occur. Storage area shall be maintained under a negative pressure ventilation system. Daily inspections of the waste storage area shall be required.

Storage of asbestos waste will not exceed 50 cubic yards. Authorization from the New York City Department of Sanitation (NYCDOS) and additional requirements, per code, will be required if accumulation of asbestos is anticipated to be greater than 50 cubic yards. Containers holding asbestos waste will be inspected daily to ensure no visible emissions of asbestos dust in the air or breaks in the container.

5.4 PCBS

Non-leaking waste PCB waste will be placed in containers and maintained in the waste storage area prior to disposal. Any leaking PCB articles or containers will be transferred to properly marked, non-leaking containers or an over-pack containers. Leaking waste PCB articles and equipment that cannot be transferred to a non-leaking container or over pack container will be placed in a containment pad with sorbent material and tarp. PCB bulk product waste, including fluorescent light ballasts, may be kept in the waste storage area up to 180 days.

6. TRANSPORTATION REQUIREMENTS

All waste materials will be transported in accordance with applicable local, state and federal DOT regulations including, but not limited to, bills of lading, manifests, placards, etc. All wastes will be shipped using properly permitted vehicles operated by drivers with Commercial Drivers Licenses (CDLs) and Hazardous Materials endorsements. All hazardous waste will be shipped using transporters with RCRA identification numbers. The actual modes of transportation to be utilized will be determined following the identification of all anticipated waste streams and will take into account the location and distance to the selected disposal facility as well as cost considerations. Site-specific transportation requirements are in the process of being developed. Once they have been finalized, those requirements will be appended to this plan and made a part of this plan by reference. All off-site shipments of waste will adhere to the site-specific transportation requirements. As required by NYSDEC (6 NYCRR Part 364) all hazardous and asbestos wastes will be transported using Part 364 permitted haulers. All haulers will be required to submit for approval and follow a Spill Contingency Plan.

7. TRAVEL ROUTES

Travel route(s) will be determined following discussion with the appropriate regulatory agencies (e.g., New York City Department of Transportation). The selected waste transporter(s) will follow the designated travel routes. The Abatement Subcontractor has submitted to the Contractor for acceptance waste removal and transportation procedures, which are currently under review. Upon approval of the proposed Abatement Subcontractor's *Proposed Waste Removal and Transportation Procedures*, the approved procedures will be appended to this plan

and incorporated by reference. All waste travel routes will be consistent with the approved procedures.

8. DISPOSAL FACILITIES

Waste recycling/disposal facilities will be selected based on several factors including waste types, facility acceptance criteria, regulatory compliance history, etc. Only those facilities that have valid federal/state/local permits to accept the waste type proposed for recycling/disposal at the facility will be used. A list of potential disposal facilities is provided as Attachment 3 of this Plan; however, it should be noted that this list is not inclusive nor does identification of these facilities imply an endorsement of the suitability of these facilities at this time.

Following initial selection of potential disposal facilities, the facilities that may be used for waste recycling/disposal will be contacted to determine if they have any facility-specific waste sampling requirements that were not met during the initial waste sampling effort. Based on facility-stated needs, additional sampling may be required. Disposal facilities will be chosen based on their ability to accept the different types of waste that this Deconstruction Project will generate, as well as other factors identified above.

All pertinent and required information for all proposed disposal facilities must be provided to the Contractor a minimum of one month in advance of any schedule to transport waste. All proposed disposal facilities must be approved by LMDC prior to shipment of any waste.

9. DOCUMENTATION

All applicable local, state and federal documentation and record keeping requirements/guidelines will be followed. Documentation for hazardous waste disposal includes Hazardous Waste Manifesting, EPA Generator ID, EPA transporter ID, EPA ID for waste disposal facility and waste storage locations and capacities. Also documented will be emergency notification and operating procedures, worker training records (HAZWOPER, Asbestos, etc.), organizational chart, unexpected waste procedures, contractor involvement list and copies of the regulatory requirement certifications of transporters, disposal facilities, etc.

Specific regulatory documentation may change depending on the types and amounts of waste to be generated. The Contractor shall be responsible for document management.

For generators of asbestos waste, refer to the Asbestos and COPC Abatement and Removal Plan, for information detailing what documents must be created/maintained.

For generators of non-hazardous (C&D debris) waste, the following documents must be created/maintained:

- Waste determination records (to confirm that the material is not hazardous waste)
- Shipping papers (non-hazardous waste manifests, bills of lading)

For generators of hazardous waste, the specific reporting and recordkeeping requirements depend on whether the project generates waste in the quantities that would classify the generator of the waste (the Owner) as a Large Quantity Generator (LQG), a Small Quantity Generator (SQG), or a Conditionally-Exempt Small Quantity Generator (CESQG). Reports/Documents that may be required include the following:

- Notification of Regulated Waste Activity (required of LQG and SQG)
- Exception Reports (required of LQG and SQG)
- Incident Reports (required for LQG)
- Hazardous Waste Reduction Plan (required of LQG that generates more than 25 tons of hazardous waste per year)
- Annual Hazardous Waste Generator Report (required of generators that are classified as LQG for at least one calendar month in the year)
- Proof of Small Quantity Generator Status (required of SQG and CESQG)
- Hazardous Waste Determination Records (required of LQG, SQG, and CESQG)
- Weekly Inspection Logs (required of LQG and SQG)
- Hazardous Waste Manifests (required of LQG and SQG, best management practice for CESQG)
- LDR Forms (required of LQG and SQG, best management practice for CESQG)
- Exception Reports (required of LQG and SQG)
- Contingency Plan (required of LQG)
- Personnel Training Documentation (required of LQG best management practice for SQG and CESQG)

In New York State, PCB waste (greater than 50 parts per million PCB) is also New York State hazardous waste. Therefore, the documentation specified for hazardous waste above will also apply to PCB waste. In addition, for each facility that uses/stores at any one time 45 kilograms of PCBs in containers or one or more PCB transformers or 50 or more large high- or low-voltage

capacitors must develop and maintain an annual document log. At this time, since the waste survey has not yet been performed, it is not known if this requirement applies to the Building. If PCB transformers are present at the Building, weekly inspections must be performed and inspection logs created/maintained. Certificates of disposal must be obtained for all PCB wastes disposed and large-volume PCB waste generators must also develop and maintain an annual document log.

For generators of universal waste, the specific reporting and recordkeeping requirements depend on whether the project generates waste in the quantities that would classify the generator of the waste (the Owner) as a Large Quantity Handler of Universal Waste (LQHUW) or a Small Quantity Handler of Universal Waste (SQHUW). Reports/Documents that may be required include the following:

- Notification of Universal Waste Management (required of LQHUW that have not already received an EPA Identification number)
- Records of shipment of universal waste to another facility (non-hazardous waste manifest, bill of lading, universal waste manifest, etc.) and records of receipt of universal wastes from another facility (required of LQHUW)
- Personnel Training Documentation (required of LQHUW and SQHUW, personnel training in proper handling and emergency procedures)

ATTACHMENT 1
LIST OF POTENTIAL HAZARDOUS AND UNIVERSAL WASTE

ATTACHMENT 1 LIST OF POTENTIAL HAZARDOUS AND UNIVERSAL WASTE (SEE NOTE 1)				
Potential Waste Stream	**Preliminary Waste Characteristics**	**Characterization Process**	**Disposal Options**	**Approximate Quantity**
Lamps	Universal Waste	None Required	Shipment to a Large Quantity Handler of Universal Waste (LQHUW)	100,000
Batteries	Universal Waste	None Required	Shipment to a LQHUW	Not Quantified
Mercury Thermostats	Universal Waste	None Required	Shipment to a LQHUW	Not Quantified
Ballasts and associated potting material	Note 2	Note 2	Shipment to a licensed TSDF as selected by the Contractor and approved by LMDC	25,200
PCB-containing equipment, e.g. oil-filled switched, transformers, capacitors	NYS Hazardous Waste, TSCA waste	40 CFR 761	Note 3	Not Quantified
Mercury-containing Switches	Hazardous - toxicity	40 CFR 261.24	Shipment to a licensed TSDF as determined by LMDC	Not Quantified or Identified
Used Oil	Hazardous - ignitability	40 CFR 261.21 6 NYCRR Subpart 374-2	Note 4 (if used oils are classified as hazardous, it would be as likely due to their halogen content (see federal rebuttable presumption (40 CFR 279.10 (b)(ii))	Not Quantified
Used Fuel Oils (to be handled the same way as Used Oil)	Hazardous - ignitability	40 CFR 261.21 6 NYCRR Subpart 374-2	Note 4	Not Quantified
Refrigerants	Ozone-depleting compound	None required	Note 5	Not Quantified
Fire Extinguishers		None required – manufacturer will be contacted for proper characterization	As determined by the applicable manufacturer	Not Quantified
Halon Fire Suppression Systems	Ozone-depleting compound	None required – Halon information will be obtained from equipment	Note 6	Not Quantified
Miscellaneous Stored Containers: • Anti-freeze • Cleaning Solutions • Paints • Corrosion Inhibitors • Neutralizing Acid • Joint Compound • Coolant • Water Treatment	Note 7	Note 7	Note 8	Most materials removed prior to LMDC ownership.

LIST OF POTENTIAL HAZARDOUS AND UNIVERSAL WASTE (cont'd)				
WTC Dust	Note 9	Note 9	Shipment to a licensed TSDF as determined by the generator	Unknown

NOTES:	
Note 1	A complete waste characterization of 130 Liberty Street has not been conducted. This waste characterization will be conducted prior to the commencement of any deconstruction activities. As such, the potential waste streams and associated quantities are only approximations. A more definitive inventory will be provided on the basis of the waste characterization results.
Note 2	All fluorescent light fixture ballasts and associated potting material, regardless of labeling or age, will be classified as PCB- containing and managed as such.
Note 3	Specific disposal requirements will be based upon the concentration of PCBs identified within the applicable equipment. Disposal will be in accordance with 40 CFR 761 and 6 NYCRR Subpart 371.4(e).
Note 4	Used oils that are not hazardous wastes and cannot be recycled under 6 NYCRR Subpart 374-2 will be disposed in accordance with the requirements of Part 360 of Title 6. Used oils that are identified as a hazardous waste and cannot be recycled in accordance with 6 NYCRR Subpart 374-2 or Subpart 360-14 of Title 6 will be managed in accordance with the hazardous waste management requirements of Parts 370 through 374-1 and 376 of Title 6.
Note 5	A licensed refrigerant technician will be contracted to recover all refrigerant contained within applicable building components/equipment. All refrigerant will be recycled.
Note 6	A licensed technician will be contracted to recover all Halon contained within applicable fire suppression systems. All Halon will be recycled.
Note 7	MSDS information will be used to characterize material found within miscellaneous stored container. If MSDS are not available a complete RCRA hazardous waste determination will be conducted.
Note 8	All miscellaneous materials will be segregated according to their waste characterization designation (e.g. using either MSDS information or complete RCRA hazardous waste analysis). When possible, bulk materials will be shipped in their original containers, provided that the containers meet the minimum requirements set forth by Department of Transportation packaging rules for the hazardous substance it contains. If this is not possible, like materials will be "lab-packed" and sent off site for disposal per their waste designation. Alternatively, like materials may also be transferred to DOT-approved shipping container (e.g., those waste streams in drum quantities).
Note 9	The results of a preliminary waste characterization conducted by TRC, documented within a report dated 2-10-05, indicated that a composite bulk dust sample collected from the 40th floor mechanical room contains cadmium above the hazardous waste threshold. Therefore, unless additional waste characterization indicate otherwise, WTC dust as a separate stand alone waste stream collected from the 40th floor mechanical room, will be managed as a hazardous waste. All other preliminary sample data collected from other portions of the building has indicated that the WTC dust can be managed as a non-hazardous asbestos-containing waste.
Note 10	All hazardous and universal waste will be transported to their applicable disposal facilities utilizing transporters possessing a valid New York State Part 364 Waste Transporter Permit.
Note 11	A list of potential licensed disposal facilities is contained within Attachment 3. The Contractor will select disposal facilities. LMDC will approve of all disposal facilities prior to the shipment of any wastes.

ATTACHMENT 2
SAMPLE MANAGEMENT, LABELING AND QA/QC

When samples are collected by the Environmental Consultant they will designate by an alphanumeric code that will identify the sample location and sample type. The sample code will consist of five sub-codes as follows: a sample phase code; floor location; a unique sequential sample number; a matrix code; and a QA/QC code. The sample phase code designates the sampling phase in which the sample was collected ("1" for Phase 1, "2" for Phase 2, etc.); the building code designates the building from which the sample was collected; the matrix code designates the sampled matrix; the unique sequential sample number provides a unique three-digit identifier for each sample, and the QA/QC code denotes the sample classification (i.e., normal or type of QA/QC). All samples collected at the Building will be designated with the building code "130." The QA/QC codes will be as follows:

▪ QA/QC Codes: 01 – Normal Sample 02 – Duplicate Sample 03 – Equipment Blank 04 – Trip Blank	▪ Matrix Codes: D – Floor Dust C – Composite Sample W – Surface Wipe

A typical sample may be identified as 2-40-005-D-01. The "2" code indicates the samples was collected during Phase 2 of the sampling, the "40" code indicates that the sample was collected from the 40th floor, the "005" indicates that it is the fifth sample collected, the "D" indicates it is a floor dust sample, and the "01" code classifies it as a "normal" sample.

Each sample collected from the Building as part of this sampling program will be identified with a unique, sequential sample ID reflecting the floor the sample was taken and the sequential number of the sample. Sample labeling procedures are specified in the EPA Standard Operating Procedure (SOP) for Sample Labels. This SOP will be utilized for this sampling program.

In general, each sample container will be labeled with the following information:

- Project name.
- Project number.
- Location/site ID.
- Date of sample collection.
- Time of sample collection.
- Sampler initials.
- Media sampled.
- Analyses to be performed.

- Container type.
- Preservatives (if applicable).
- The number of containers for the sample (1 of 2, 2 of 2, etc.).

A Chain-of-Custody (COC) form will be completed and will accompany each separate shipping package to the laboratory. In summary, the following information will be contained on each completed COC:

- Site name – 130 Liberty Street.
- Laboratory name and contact.
- Turn-around time (TAT) requested.
- Sample ID, matrix, date, and time.
- Parameters and analytical methods.
- Unique courier-assigned package tracking number.
- Sample technician name(s) and release signature.

The field personnel will notify the laboratory 24 to 48 hours in advance of sample shipment so that the laboratory personnel may get prepared for the sample receipt and analysis. Samples will be packed and shipped in accordance with applicable U.S. Department of Transportation (DOT) regulations, Environmental Consultant Corporate Guidelines, and International Air Transport Association (IATA) standards (if shipped by air carrier, as detailed in the most current edition of IATA Dangerous Goods Regulations for hazardous materials shipments). Samples will be prepared and shipped to the laboratory according to the following procedures:

- All sample jars, once cleaned and labeled, will be placed in clean plastic re-sealable bags. Medium or high concentration samples (determined through field observations, field screening, air monitoring, or all three) will also be packaged in metal cans. The lids of the metal cans will be secured with at least three metal lid clips. The exterior of the metal cans will be labeled in the same fashion as the sample jar.

- Place samples in a cooler and surround them with vermiculite (or equivalent) packing material for moisture absorption and stability during transport.

- Place sufficient double-bagged ice in the cooler to maintain 4°C temperature.

- Place a "temperature blank", consisting of a water-filled plastic container, in each cooler. The temperature blank will be recorded by the laboratory upon receipt to ensure adequate sample temperature.

- Place completed COC form inside a re-sealable plastic bag, and tape the bag to the inside of the cooler lid.

- Secure the cooler lid with packing tape. Place signed and dated custody seals on two opposite sides of the lid and secure with clear tape.

- If applicable, tape the drain plug closed so that it will not open.
- Place upward-pointing arrow label on two opposing vertical sides of the cooler.
- Label the cooler with laboratory address, name of laboratory contact, telephone number, and project identification.
- Attach applicable IATA and/or DOT identification labels.
- Attach a completed courier shipping label (if applicable).

Samples will be classified as environmental samples unless there is evidence of high concentrations of chemical constituents, based on visual observations, odors, previous sample data, or other criteria. All waste liquid, waste solid, tank, drum, and other container samples will be considered hazardous material samples and will be packaged and transported in conformance with the U.S. DOT, U.S. Postal Service (USPS), and the IATA Dangerous Goods Regulations if shipped by air carrier. These regulations/requirements have de minimus exemptions for small volume samples; they will be referred to prior sample shipment to ensure all requirements are being met.

The United States Environmental Protection Agency's Environmental Response Team (EPA ERT) publishes sampling SOPs for sampling at CERCLA hazardous waste sites. These SOPs will be followed during the sampling at this site.

QA/QC samples will be collected to assist in the interpretation and validation of the laboratory analytical results. The QA/QC samples that will be collected during this characterization sampling program include field duplicates or co-located samples. Field duplicate samples will be collected as a check on laboratory accuracy and precision. One duplicate dust sample will be collected from the bulk dust and or high-efficiency particulate air (HEPA) filters. The duplicate sample will be placed in the appropriate, clean, laboratory-prepared sample containers and analyzed for the same parameters.

ATTACHMENT 3
PRELIMINARY LIST OF POTENTIAL DISPOSAL FACILITIES

Please note that the disposal facilities listed herein are provided for informational purposes only. The list consists of permitted facilities that may be used for disposal of the indicated waste streams. The Contractor and their Subcontractors reserve the right to respond to market and other relevant conditions in the selection of the disposal facilities and to utilize disposal facilities other than those indicated herein provided they are properly permitted to receive said waste type(s). The Contractor also reserves the right to audit said facilities prior to final selection

Note of the following facilities, or any other facility, may be used without prior written approval by LMDC**.**

The following facilities may be used for disposal of asbestos-containing and contaminated materials:

- Meadowfill Landfill (304) 842-2784
  Bridgeport, WV
- Cumberland County Land (717) 423-5917
  Newburgh, PA
- Imperial Landfill (724) 695-0900
  Imperial, PA
- Grows Landfill (215) 736-9475
  Morrisville, PA
- Tullytown Landfill (215) 943-9732
  Tullytown, PA

The following facilities may be used for disposal of construction and demolition (C&D) materials:

- Cumberland County Landfill (717) 423-5917
  Newburgh, PA
- Hakes C&D Landfill (585) 466-7271
  Painted Post, NY

The following facilities may be used for disposal of hazardous and miscellaneous materials:

- American Re-Fuel Company (516) 683-5443
  Westbury, NY

- American Re-Fuel Company
  Newark, NJ
  (973) 344-0900
- BDT, Inc.
  Clarence, NY
  (716) 634-6794
  EPA ID No. NYD000632372
- Bethlehem Apparatus
  Hellertown, PA
  (215) 838-6333
  EPA ID No. PAD602390961
- BFI Conestoga Landfill
  Morgantown, PA
  (610) 266-6844
- Central Waste, Inc.
  Alliance, OH
  (330) 823-6220
- Chemical Waste Management
  Model City, NY
  (716) 754-8231
  EPA ID No. NYD049836679
- Clean Earth of North Jersey
  Kearny, NJ
  EPA ID No. NJD991291105
- CWM-SRR
  W. Carrolton, OH
  (513) 859-6101
  EPA ID No. OHD093345293
- Dupont Chamberworks
  Deepwater, NJ
  (609) 299-5000
  EPA ID No. NJD002385730
- Ensco, Inc
  El Dorado, AR
  (501) 863-7173
  EPA ID No. ARD069748192
- Envirite of Pennsylvania
  York, PA
  (717) 846-1900
  EPA ID No. PAD010540045
- Envirosafe Services of Ohio
  Oregon, OH
  (800) 537-0426
  EPA ID No. OHD045243706
- Giant Cement Company
  Harleyville, SC
  (803) 496-5033
  EPA ID No. SCD003351699
- G.R.O.W.S
  Morrisville, PA
  (215) 736-9475
  EPA ID No. PAD000429589
- Horizon Environment, Inc.
  Grandes-Piles, Quebec, Canada
  (888) 767-0088
  EPA ID No. 1142031856
- Inmetco
  Elwood City, PA
  (412) 758-2819
  EPA ID No. PAD087581015
- Keystone Potrland
  Bath, PA
  (215) 837-2240
  EPA ID No. PAD002389559
- Maplewood Recycling, Inc.
  Jetersville, VA
  (604) 561-5787
- Marisol, Inc.
  Middlesex, NJ
  (732) 469-5100
  EPA ID No. NJD002465655

- Meadowfill Landfill (304) 842-2784
  Bridgeport, WV

- Phillip Services Corp. (215) 822-6996
  Hatfield, PA EPA ID No. PAD085690592
- Revere Smelting & Refining (914) 592-4414
  Middletown, NY
- Ross Incineration (440) 748-2200
  Grafton, OH EPA ID No. OHD048415655
- Stablex Canada (800) 782-2539
  Blainville, Quebec, Canada EPA ID No. NYD980756415
- Taylor County Landfill (476) 862-2504
  Mauk, GA
- Trade Waste Incineration (618) 271-2804
  Sauget, IL EPA ID No. ILD098624424
- T.R.R.F. (Tullytown) (215) 736-9400
  Tullytown, PA
- Waste Technologies, Inc. (216) 385-7337
  East Liverpool, OH EPA ID No. OHD980613541
- White Pines Landfill (717) 458-4602
  Millville, PA

The following facilities/services may be used for metal salvage:

- Mid Island Salvage Co.
  1007 Long Island Avenue
  Deer Park, NY 11729

- Aleris International Inc.
  368 West Garfield Road
  Cold Water, Michigan 49036

- Wabash Alloy
  4525 West Old 24
  Wabash, IN 46992

- Ohio Valley Aluminum Company
  1100 Brooks Industrial Road
  Shelbyvulle, Kentucky, 40065

- Weirton Steel Corporation
  400 Three Springs Drive
  Weirton, West Virginia 26062

- Nucor Steel Auburn, Inc.
  25 Quarry Road
  Auburn, NY 13021

- Gerdau Ameristeel
  225 Elm Street
  Perth Amboy, NJ 08862

AMBIENT AIR MONITORING PROGRAM
for the
130 LIBERTY STREET
DECONSTRUCTION PROJECT

June 13, 2005

LOWER MANHATTAN DEVELOPMENT CORPORATION
1 Liberty Plaza
New York, New York

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1.0 INTRODUCTION

1.1 Project Background and Evolution

This document entitled *Ambient Air Monitoring Program for the 130 Liberty Street Deconstruction* Project (Proposed Plan) represents a revised and combined air monitoring plan incorporating the following two prior plans: (i) the Draft Plan provided as Section 2 of the Draft Deconstruction Plan issued by Contractor on December 10, 2004 and (ii) the companion plan prepared by TRC Environmental Corporation (TRC) entitled *Proposed Enhanced Exterior Air Monitoring Approach and Conceptual Design 130 Liberty Street* (October 8 2004**.** Both of these documents were issued by the Lower Manhattan Development Corporation (LMDC) in December 2004 for review and comment by federal, state, and local regulators and the general public. At the time of release, readers of the two companion plans were advised by LMDC that, due to their independent development, there were redundancies and a good deal of overlap in the two plans. For this reason, LMDC intended to revise the two programs to ensure that the contractor's and property owner's monitoring programs were complementary and contained the necessary overlap to serve Quality Assurance/Quality Control purposes.

The December 2004 plans were submitted to regulatory agencies for review**.** Written responses from the United States Environmental Protection Agency (USEPA~~)~~, the New York State Department of Environmental Conservation (NYSDEC)**,** and the New York State Department of Labor (NYSDOL) addressing the December 2004 plans were provided to LMDC on January 31, 2005. This Proposed Plan was prepared to address the agencies' January 31, 2005 responses.

Additionally, subsequent to release of the December 2004 air monitoring plans**,** an approved monitoring plan for the deconstruction of 4 Albany Street was issued. This plan**,** entitled *Specifications for Community Environmental Monitoring During Abatement and Demolition of 4 Albany Street* **(**December 22, 2004**),** was approved for use by many of the same regulatory agencies reviewing the deconstruction of 130 Liberty. Accordingly, and at the direction of the regulators, the Proposed Plan adopts many of the features of the 4 Albany Street monitoring program**.** Most notably, the Proposed Plan adopts the two tiered system of action levels approved for use at 4 Albany Street.

This Proposed Plan appropriately consolidates the monitoring features previously offered in the two December 2004 companion programs. Once approved, the Proposed Plan will be implemented and administered by the Deconstruction Contractor and its specialty sub-contractors during the Preparation Phase, Phase I and Phase II of the deconstruction of the 130 Liberty Street property. In addition, LMDC will utilize an independent Environmental Consultant to serve in an oversight role. Such oversight will include specified Quality Assurance/Quality Control measures. This document does not provide all of the details of the quality assurance/quality control measures that will be implemented by LMDC. These measures are more appropriately be addressed in a Quality Assurance Project Plan (QAPP) that will be prepared and issued at a later date after a final approved air monitoring program is in place.

1.2 Project Purpose and Objectives

The principal purpose of the air monitoring program is to monitor air quality in the vicinity of 130 Liberty Street during the deconstruction of the building on that property. The Proposed Plan consists of monitoring of fugitive dusts in the vicinity of the deconstruction site on both a real-time or continuous basis as well as a time-weighted or integrated basis.

Principal objectives of the program are as follows:

- Monitor dusts as PM_{10} on a real-time or continuous basis such that fugitive dusts associated with the building deconstruction are maintained below predetermined action levels.

- In the event that fugitive dusts levels exceed predetermined action levels, building deconstruction management personnel will be immediately notified so that all necessary corrective actions can be taken.

- Monitor PM_{10} on a time weighted or 24-hour average basis to provide assurances that levels of respirable particulate matter associated with the deconstruction are below National Ambient Air Quality Standards (NAAQS) of 150 ug/m^3.

- Collect particulate matter on a time-weighted or integrated basis such that samples are available for monitoring of target compounds potentially associated with World Trade Center dust (e.g., asbestos, lead).

- Compare measured concentrations of project target parameters to action levels established on a compound specific basis. In the event that measured concentrations exceed any project specific action level for one or more of these target compounds**,**appropriate corrective actions immediately will be taken.

1.3 Overview of Air Quality Monitoring Programs and Features

- There are multiple aspects and levels to the overall air monitoring program proposed for the deconstruction of 130 Liberty Street. The following is a brief summary of the three (3) components or levels of air monitoring proposed for the project:

- "Level 1": The subcontractors performing aspects of Phase I deconstruction work (largely interior, non-structural efforts) will be responsible to collect air samples on their personnel directly performing various work activities to determine airborne levels of contaminants potentitally generated by the work at the source as required by OSHA.

- "Level 2": The next layer of sampling is for ICR 56 compliance. ICR 56-required sampling will be performed by the Contractor third party consultant who will sample the ambient air inside the building during Phase I work outside of work areas, at the personnel and waste load out decontamination stations and other locations. In addition, samples will be collected outside the building within ten (10) feet of the negative pressure ventilation exhaust. This sampling is further described in the Asbestos and COPC Abatement and Removal Plan.

- "Level 3": Beyond that, Contractor 's consultant will also be continually monitoring the exterior ambient air within the site boundaries and at specific elevated locations across the street from of the site, as described in this Ambient Air Monitoring Program.

While various parties will have responsibility for diligently executing different components of the program information will flow through Contractor to the LMDC and their consultants as part of a coordinated review and quality control process**.** Additionally, all monitoring results requested by the various regulators overseeing this project will be provided to them on a timely basis.

This Ambient Air Monitoring Program documents Contractor 's proposed program of "Level 3" only. The other two "levels" of air monitoring outlined above are documented in the Health and Safety Plan and The Asbestos and COPC Abatement and Removal Plan Sections of the Phase I Deconstruction Plan.

In addition, the Lower Manhattan Construction Command Center ("LMCCC") will conduct an air quality monitoring program throughout the Lower Manhattan rebuilding process. The program will begin during the summer of 2005 and will be administered by the LMCCC in consultation with the United States Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (DEC), and New York City Department of Environmental Protection (DEP).

The LMCCC's program will focus on preventing elevated concentrations of particulate matter in surrounding neighborhoods during construction and will inform measures to minimize potential impacts. The LMCCC will analyze both short-term and long-term data throughout the rebuilding process in order to take appropriate mitigation action and enforcement if necessary. The air monitoring program will consist of $PM_{2.5}$ and PM_{10} fixed air samplers located in the neighborhoods surrounding the sites of major construction activities in Lower Manhattan including the World Trade Center Site redevelopment, the deconstruction of 130 Liberty Street, the Route 9A reconstruction, Fulton Street Transit Center, and the World Trade Center Transportation Hub. The proposed vicinities of the air monitoring locations include: northern Battery Park City/Tribeca, southern Battery Park City, Park Row/City Hall Park, and the Financial District.

The LMCCC's plan also includes project environmental performance commitments such as the use of ultra-low sulfur diesel fuel in off-road construction equipment. Construction sites will be encouraged to use electrically powered equipment instead of diesel powered equipment where practical. Idling times on diesel powered engines will be restricted to three minutes. Dust control measures will be enforced at construction sites, limiting the release of particulate matter. The LMCCC will also have ability to monitor and enforce these environmental performance commitments.

2.0 SAMPLING SITES

2.1 Network Design

Due to the unique circumstances associated with this deconstruction project two different types of monitoring sites are recommended for inclusion in the active monitoring network as follows:

- **Street Level Stations**- These locations essentially represent sidewalk settings situated around the perimeter of the building.

- **Upper Level Stations**- While extremely unlikely, it is not impossible for dusts to be released during building deconstruction at upper levels of the 40-story structure.. Accordingly, the proposed network will make use of a number of monitoring sites in place at elevated locations above street level. Three (3) such stations will be included in the monitoring network as shown in Figure 1.

2.2 Siting Criteria and Network Operations

The proposed network will be comprised of seven (7) stations in simultaneous operation at all times that building deconstruction activities are in progress, four (4) street level and three (3) elevated. The placement of sampling stations will follow USEPA and United States Army Corps of Engineers (ACOE) siting criteria for ambient particulate sampling systems to the extent possible. Strict adherence to these criteria at all stations may not be possible given the topography and logistics of the urbanized environment characteristic of the Lower Manhattan setting.

All four (4) of the ground level stations in the vicinity of the deconstruction site will be connected to a central computer housed in the site vicinity. The three (3) stations situated at elevated sites above street level will collect data continuously and telemeter (wirelessly transmit) the data to the central computer. All seven (7) of the monitoring stations in the immediate vicinity of the deconstruction site will monitor particulate as PM10 on a real-time basis. These data will be logged continuously at each of the sites as well as on the data logger contained in the on site computer center. These data will be stored and archived as 5-minute averages for each of the seven (7) stations.

2.3 Locations of Monitoring Stations

The list of proposed monitoring locations is provided in Table 1. These include four (4) stations situated at ground or street level and three (3) stations situated at elevated locations atop buildings adjacent to the 130 Liberty Street property. Actual stations pending access will be placed on roof-tops or setbacks of buildings directly across the street along the perimeter of the deconstruction site. The approximate locations of each of these stations in relation to the 130 Liberty Street Site are shown in the site schematic provided as Figure 1. Figure 1 also includes a composite wind rose representative of the New York Metropolitan area noting predominant wind directions likely to be characteristic of the project work zone during the term of the

deconstruction project. These wind directional data were taken into consideration in the actual placement of monitoring stations around the 130 Liberty Street Site.

Table 1. Locations of Monitoring Stations – 130 Liberty St. Deconstruction Air Monitoring Network

Location #	Description
1	Southwest of building (Washington St./Albany St.) at ground level.
2	Southeast of building (Albany St./Greenwich St.) at ground level.
3	Northeast of building (Greenwich St) at ground level.
4	Northwest of building (Washington St./Cedar St.) at ground level.
5	Fire station (10-10 House) roof on Greenwich Street at an elevation of approximately 40 feet.
6	Apartment building (125 Cedar St) roof behind fire station at an elevation of approximately 160 feet.
7	Apartment building (120 Greenwich St) roof at corner of Albany St./Greenwich St. at an elevation of approximately 200 feet.

3.0 SAMPLING PHASES

Sampling phases will consist of the following segments: Background, Preparation Phase, Phase I – Asbestos and COPC Abatement, and Phase II - Structural Deconstruction. General descriptions of the work included in each phase are presented below.

3.1 Background

The background ambient air sampling period will consist of two weeks (14 consecutive calendar days) of monitoring performed prior to the start of Preparation Phase activities. Samples will be collected using all seven (7) stations in the monitoring network. Target parameters and the frequency of sample collection will follow measures presented in Sections 4 and 6, respectively.

3.2 Preparation Phase

The Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, erection of sidewalk sheds, and the removal of existing netting on the exterior of the building.

3.3 Phase I - Asbestos and COPC Abatement

Phase I of the Deconstruction Project includes the cleaning and removal of all interior surfaces and non-structural elements within the building under containment. During the Phase I cleanup and abatement, a minimum buffer zone of two floors, will be maintained between the active abatement (Phase I) area and the exterior abatement/structural demolition (Phase II) portion of the project. The proposed Phase I cleanup and abatement will be conducted so that the Building can be safely deconstructed to allow for redevelopment of the WTC Site. This Phase I project entails:

- The use of a licensed abatement contractor to perform Phase I work within a negative pressure enclosed work area;

- Work includes the removal and disposal of soft strip/interior gut items and general area cleanup of dust and debris;

- Removal and disposal of installed porous and certain non-porous building materials and components. Work includes removal and disposal of all interior non-structural elements including but not limited to ceiling tiles, carpet, gypsum wall board, mechanical, electrical and plumbing, wiring/cabling, fiberglass insulation, doors, fireproofing, toilet fixtures;

- Cleaning and salvage of certain installed non-porous building equipment and components contaminated by dust and debris;

- Removal of building materials containing asbestos which were present in the Building prior to September 11th, 2001 (referred to herein as "ACBM"), primarily within the Building interior; and

- Erection of the crane and hoist.

3.4 Phase II – Structural Deconstruction

Phase II – Structural Deconstruction includes the cleaning of building exterior (i.e. building washdown), the structural deconstruction of the remaining cleaned steel, large MEP, concrete, and curtain wall and curtain wall components as well removal of exterior and roof, and roof equipment. Phase II will follow successful completion of Phase I work on a floor. Phase II of this project entails:

- Removal of cooling tower transite ACBM materials, rooftop ACBM caulking, and exterior façade aluminum panel ACBM caulking and localized removal of exposed exterior spray-on fireproofing**,**

- Structural deconstruction of the Building including but not limited to the cleaning of the exterior of the building (i.e. building washdown), removal of cleaned roof, roof equipement, curtain wall components, structural steel, concrete and large equipment requiring the use of the tower crane for removal~~;~~ and

- Backfilling site**.**

4.0 TARGET PARAMETERS/COPCs

In February 2002, a multi-agency task force headed by the USEPA was formed to evaluate indoor environments for the presence of contaminants related to the WTC terrorist attacks that might pose long-term health risks to local residents. As part of this evaluation, a task force sub-committee was established to identify Contaminants of Potential Concern (COPC Committee) that are likely associated with the WTC disaster and establish health-based benchmarks for those contaminants in support of planned residential cleanup efforts in Lower Manhattan.

In addition, a number of other studies conducted by USEPA (EPA/600/R-03/142 December 2003) and (work performed by Louis Berger Group) were examined as a means of establishing a listing of target parameters appropriate to satisfy the purpose and objectives of the current deconstruction project. These objectives include active real time monitoring of fugitive dusts potentially related to the deconstruction as well as identifying levels of COPCS associated with the materials at 130 Liberty. In this manner the deconstruction project can proceed while providing an ample margin of safety for human health and the environment in the vicinity of the project site.

Most recently, USEPA approved an air monitoring program for use during the deconstruction of 4 Albany Street, another building contaminated by WTC dust as a result of the WTC disaster. This Plan entitled *"Specifications for Community Environmental Air Monitoring During the Abatement and Demolition of 4 Albany Street"* was issued as approved for use by USEPA and NYDEC on December 22, 2004. The target parameters identified for monitoring during this abatement and demolition program were also considered in the course of developing the list of target parameters for the 130 Liberty Street property.

Based upon these criteria the following target parameters were selected for inclusion in the monitoring program:

- PM_{10}-Respirable Particulate
- Asbestos
- Crystalline Silica
- PCDDs/PCDFs
- PAHs
- PCBs
- Metals (antimony, barium, beryllium, cadmium, chromium, copper, lead, mercury (gaseous and particulate bound) manganese, nickel and zinc).

5.0 SAMPLING AND ANALYSES METHODOLOGY

A summary of all sampling and analyses methods proposed for use during the deconstruction of 130 Liberty Street is provided in Table 2. All analytes will be measured at each of the seven (7) stations identified in Section 2.0 of this plan during all three (3) of the program phases. These phases as defined in Section 3.0 of this plan include background monitoring (2 weeks prior to Phase I), Preparation Phase, Phase I - Asbestos and COPC Abatement, and Phase II - Structural Deconstruction. As noted, all samples in Table 2 will be collected over 24-hour integrated time periods with the exception of asbestos, PM_{10} and mercury vapor employing the Lumex device. Asbestos samples will be collected over 4-12 hour averaging periods, while PM_{10} measurements will be collected on a continuous near "real time" basis. Proper chain of custody procedures will be employed for all intregrated samples collected. Details regarding the sampling and analyses methods planned for each type of target parameter is provided in the following sections.

Table 2. Summary of Sampling and Analyses Methods

Analyte	Sampling Method	Sample Rate*	Duration Per day	Comments
Metals				
Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel, and Zinc	TSP High Volume Air Sampler 40 CFR Part 50 App B	1000 lpm	24 hours	XRay-Fluoresence (XRF) EPA Method IO 3.3
Mercury (Gas)	Ohio Lumex RA 915+ Direct Read	20 lpm	Instantaneously	Elemental (gas) Mercury Analysis
Mercury (Total)	Iodated Carbon Trap with CVAF	4 lpm	24 hours	
Particulate and Dust				
Asbestos	NIOSH 7402	2-6 lpm	Minimum of 4 hours	Analysis via AHERA Mod. Methodology
Particulate PM_{10}	Met One EBAM	16.7 lpm	24 hours	
Respirable Crystalline Silica and Dust	NIOSH 0600/7500	2.5 lpm	24 hours	SKC Aluminum Cyclone
Organics (semivolatile)				
Dioxins/Furans (PCDDs/PCDFs)	EPA TO 9A	200-300 lpm	24 hours	Quartz Fiber Filter and PUF Cartridge
Polychlorinated biphenyls (PCB)	EPA TO 4A	200-300 lpm	24 hours	Quartz Fiber Filter and PUF Cartridge
Polycyclic Aromatic Hydrocarbons (PAH)	EPA TO 13A	200-300 lpm	24 hours	Quartz Fiber Filter and PUF/XAD-2 "Sandwich" Cartridge

*lpm = liters per minute

5.1 PM_{10} Monitoring ("Real-Time"/Continuous)

5.1.1 Beta – Attenuation PM_{10} Monitors (All Sites)

The monitors selected to continuously measure PM_{10} are beta-attenuation monitors manufactured by Met One Instruments, Inc. (Met One). The Met One E-BAM will be used for continuous PM_{10} measurements. The instrument operates on the principle of beta attenuation.

The E-BAM has not been officially designated by USEPA as either Reference or Equivalent Method. However, the E-BAM design is descended directly from the BAM-1020 (which has received USEPA's designation as an Automated Equivalent Method – EQPM-0798-100), modified to provide portable battery operation and produce measurements in real-time (averaging times less than 1 hour). The accuracy and precision of the E-BAM are consistent with USEPA requirements for Class III designation for PM_{10}. Class III equivalent method instruments include any candidate instruments that cannot qualify as Class I or Class II instruments. These may either be filter-based integrated samples not meeting Class I or Class II criteria, or filter or non-filter based continuous or semi-continuous samplers. Other methods include all non-FRM or non-equivalent measurement methods capable of characterizing fine particles that may not be or have not yet been classified as an equivalent method. Existing manual and continuous analyzers in this category include the dichotomous sampler, IMPROVE samplers, nephelomethers, beta attenuation monitors, and Tapered Element Oscillating Microbalances (TEOMs). Such instruments are not precluded from becoming equivalent on a site-specific, regional or national basis.

The beta attenuation process uses a small source of beta particles (carbon-14, 60 microcuries) is coupled to a sensitive detector that counts the emitted beta particles. The dust particles are collected on a filter tape that is placed between the beta source and the detector. Dust on the filter will intercept some of the beta particles. The reduction of beta particles is proportional to the amount of dust on the filter, which allows the mass of dust to be determined from the beta particle counts. The dust mass is combined with the air volume collected during the filter exposure time to determine the PM concentration.

The E-BAM monitors will be equipped with particle size selective inlets. The design of the inlets is such that particles larger than the desired size range will be removed from the air flow, based on the air flow rate. The units will be equipped with an inlet head to separate PM_{10}. Sampling flow rate is critical to maintain the proper particle size cut points of the inlets. Flow rates are maintained at 16.7 liters per minute (LPM) in the E-BAM monitors using an integral flow meter, pressure sensor, and ambient temperature sensor on board each monitor.

The data from the E-BAM units will be recorded by digital data loggers using the analog signal outputs of the monitors. The PM_{10} data from the E-BAM monitors will be recorded as 5-minute, hourly, and daily (midnight-to-midnight) averages.

The data from the Dust Monitors will be recorded by CSI CR510 digital data loggers, and telemetered back via CDMA cellular modems. The loggers on-board the units will act as backup to the CSI loggers.

5.1.2 USEPA Reference Method PM_{10} Monitor

One reference method PM_{10} sampler will be collocated along side the real-time PM_{10} monitors as a quality assurance (QA) check. The sampler will rotate on a monthly basis through all real-time PM_{10} monitor locations for the duration of the monitoring program. It is proposed that a filter based PM10 EPA Reference Sampler be used such as an Andersen RAAS or performance equivalent system. In this manner the 24-hour average PM10 concentration (ug/m3) measured gravimetrically using the filter collection method can be directly compared to the average PM10 concentration measured using the collocated EBAM sampling system. The latter value will be expressed as a 24-hour average representing a composite of all 5-minute average values.

5.2 Asbestos

Asbestos sample collection will be performed in accordance with NIOSH 7402, "Asbestos by TEM". Asbestos analysis will be performed utilizing Transmission Electron Microscopy (TEM) analysis specified in 40 CFR Part 763, Asbestos Hazard Emergency Response Act, (AHERA), with the following modifications:

- The sensitivity on TEM air samples will be less than 0.002 s/cc.
- Both length and width of all asbestos fibers will be recorded.
- Confirmation by Energy Dispersive Spectroscopy (EDS) and/or Selected Area Electron Diffraction (SAED) will be performed for each sample.
- The morphology of the fibers will be noted and recorded.

5.3 Metals

- Metals sampling and analysis will be performed following EPA Reference Methods for the collection of Total Suspended Particulate (TSP) and lead (40 CFR Part 50 App B) in combination with EPA Method IO 3.3 for the analyses of metals by X-Ray fluorescence.

- Metals to be analyzed by XRF and reported are: Antimony, Barium, Beryllium, Cadmium, Chromium, Copper, Lead, Manganese, Nickel and Zinc.

5.4 Mercury (Gas/Vapor)

Real-time monitoring for mercury will be performed utilizing a Lumex RA 915+ direct read instrument. The readings will be included with the daily download of sample collection data.

The Lumex RA 915+ will be utilized to obtain detection levels below established site air contaminant criteria. At a minimum, mercury readings will be taken twice a shift at each of the fixed air monitoring locations (seven during Abatement Phase and Demolition Phases). At the

discretion of the Environmental Consultant and as daily site conditions may dictate, additional mercury readings may be taken.

5.5 Mercury (Vapor/Gas)

A separate sampling and analysis method is required for mercury, as field studies have indicated that atmospheric mercury is generally greater than 95% in the vapor phase. An iodated carbon trap will be analyzed for total elemental mercury (particulate associated/vapor) using cold vapor atomic fluorescence (CVAF). The carbon trap is a proven and sensitive method for detecting trace ambient levels of atmospheric mercury. To collect the mercury sample, a high volume pump will be attached to the carbon trap and set at a flow rate of approximately 4 liter per minute.

5.6 Respirable Dust and Crystalline Silica

Respirable dust and crystalline silica sampling will be performed according to NIOSH Method 0600 protocol with analysis following NIOSH Method 7500 (XRD).

5.7 Semivolatile Organics (PCDDs/PCDFs, PAHs, PCBs)

Each site will have two (2) General Metal Works (GMW) model PS-1 high volume air samplers to collect 24-hour samples of PAH, Dioxin/Furan and PCBs, following USEPA Method TO-13A, TO 9A, and TO-4A, respectively. One sampler will be used for PAHs. A second sampler will be use for both PCBs and D/Fs. Method TO-13A, TO4A, and TO-9A use the PS-1 samplers to draw air through a sampling train consisting of a 102 millimeters diameter microquartz filter first to collect the semivolatile PAH particulates and then a glass cylinder holding a polyurethane foam (PUF) plug (1 inch of XAD-2 adsorbent resin is used in the middle of the PAH sampling media) to collect the semivolatile vapors. The entire sampling train (filter, XAD-2, and PUF plugs) are extracted together and analyzed for speciated PAH, PCBs, and D/Fs compounds using gas chromatography/mass spectrometry. The samplers will be set to run at approximately 250 liters per minute resulting in a total air volume of 360 m^3 over the prescribed 24-hour sampling period.

6.0 SAMPLING FREQUENCY

6.1 Background

The background ambient air sampling period will consist of two weeks (14 consecutive calendar days) of monitoring performed immediately prior to the start of abatement activities. Samples will be collected using all seven (7) stations in the monitoring network. All target parameters will be collected over a 24-hour integrated period with the exception of asbestos, PM10 and mercury utilizing the Lumex instrument. PM10 will be monitored continuously at each of the seven (7) sites while asbestos measurements will be taken at a frequency of once per every eight (8) to twelve (12) hours at each of the sites.

6.2 Preparation Phase

The Preparation Phase air monitoring will follow the same schedule and frequency as described below in Phase I and will commence with the start of Preparation Phase site work.

6.3 Phase I – Asbestos and COPC Abatement Phase

During Phase I (abatement phase) air monitoring will take place at all seven (7) stations each day. During the first three (3) days only of Phase I work, samples will be collected for semivolatile organics to include PCDDs/PCDFs, PAHs and PCBs. After this first three (3) day period, samples for semivolatile organics will be reduced to a single location per week employing the seven (7) station network**.** More specifically, samples will not be collected using all seven (7) stations each day; rather a single set of samples will be collected each day at a single station in the network. This sequence will be repeated each day using a different station each day until all of the seven (7) stations have been used. In this manner a set of samples will be collected at each location every seven (7) days. The schedule will be repeated until project completion.

The semivolatile organic samples collected employing this weekly sampling frequency will not be processed for analyses; rather they will be placed in archival storage at the laboratory. A single set of samples will be selected from each sample set representing seven (7) days to undergo analyses for PCDDs/PCDFs, PAHs and PCBs. The station with the highest 24-hour average PM10 concentration (ug/m3) recorded with a collocated organic sample each week will be selected for semivolatile organic analyses.

A summary of sampling frequencies on a target parameter specific basis applicable to the abatement phase of the deconstruction program is provided in Table 3.

Table 3. Phase I -Abatement Phase Sampling and Analysis Summary

Location	Parameter(s)	Sample Frequency	Analysis Method
Site Area	Mercury (vapor/gas)	Each Day	Lumex, portable mercury analyzer
Site Area	Visible dust emissions	Each Day	Visual observation

Table 3. Phase I -Abatement Phase Sampling and Analysis Summary			
Location	**Parameter(s)**	**Sample Frequency**	**Analysis Method**
Ground/Street Level (4 Locations)	1. Asbestos 2. Silica 3. Metals	Each Day, asbestos is sampled each work shift	1. TEM 2. XRD 3. XRF
	4. PCDDs/PCDFs 5. PAHs 6. PCBs	Each Day (24 hr. Basis)	4. TO 9 A (HRGC/HRMs) 5. TO 13 A (GC/MS) 6. TO 4 A (GC/MS)
	7. PM10 8. Mercury (vapor/gas)	Continuously "Real-Time" Each Day	7. EBAM 8. IodatedCarbon Trap/CVAF
Roof Top (3 Locations)	1. Asbestos	Each Day	1. TEM
	2. Silica 3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs	Each Day (24 hr. Basis)	2. XRD 3. XRF 4. TO 9 A (HRGC/HRMS) 5. TO 13 A (GC/MS) 6. TO 4 A (GC/MS)
	7. PM10 8. Mercury (vapor/gas)	Continuously "Real-Time" Each Day	7. EBAM 8. Iodated Carbon Trap/CVAF

6.4 Phase II – Structural Deconstruction

During Phase II of the deconstruction project, air monitoring will take place at all seven (7) stations each day. During the first three (3) days only of Phase II, samples will be collected for semi-volatile organics to include PCDDs/PCDFs, PAHs and PCBs. After this first three (3) day period, samples for these organic parameters will be reduced to a single location per week frequency employing the seven (7) station network. More specifically, samples will not be collected using all seven (7) stations each day; rather a single set of samples will be collected each day at a single station in the network. This sequence will be repeated each day using a different station each day until all of the seven (7) stations have been used. In this manner a set of samples will be collected at each location every seven (7) days.The schedule will be repeated until project completion.

The semivolatile organic samples collected employing this weekly sampling frequency will not be processed for analyses; rather they will be placed in archival storage at the laboratory. A single set of samples will be selected from each sample set representing seven (7) days to undergo analyses for PCDDs/PCDFs, PAHs and PCBs. This sample set will be selected after consideration of the PM10 data corresponding to the sites and days where organic samples were collected. The station with the highest 24-hour average PM10 concentration (ug/m3) recorded with a collocated organic sample each week will be selected for analyses.

A summary of sampling frequencies on a target parameter specific basis applicable to the demolition phase of the deconstruction program is provided in Table 4.

Table 4. Phase II – Structural Deconstruction Phase Sampling and Analysis Summary			
Location	**Parameter(s)**	**Sample Frequency**	**Analysis Method**
Site Area	Mercury (vapor/gas)	Each Day	Lumex, portable mercury analyzer
Site Area	Visible dust emissions	Each Day	Visual observation
Ground/Street Level (4 Locations)	1. Asbestos 2. Silica 3. Metals	Each Day, asbestos is sampled each work shift	1. TEM 2. XRD 3. XRF
	4. PCDDs/PCDFs 5. PAHs 6. PCBs	Each Day (24 hr. Basis)	4. TO 9 A (HRGC/HRMS) 5. TO 13 A (GC/MS) 6. TO 4 A (GC/MS)
	7. PM10 8. Mercury (vapor/gas)	Continuously "Real-Time" Each Day	7. EBAM 8. Iodated Carbon Trap/CVAF
Roof Top (3 Locations)	1. Asbestos	Each work shift	1. TEM
	2. Silica 3. Metals 4. PCDDs/PCDFs 5. PAHs 6. PCBs	Each Day (24 hr. Basis)	2. XRD 3. XRF 4. TO 9 A (HRGC/HRMs 5. TO 13 A (GC/MS) 6. TO 4 A (GC/MS)
	7. PM10 8. Mercury (vapor/gas)	Continuously "Real-Time" Each Day	7. EBAM 8. Iodated Carbon Trap/CVAF

7.0 METEOROLOGICAL MONITORING

Due to the complex nature of wind movement in an around buildings in the urbanized setting of Lower Manhattan, monitoring of wind velocity and direction on a continuous basis is warranted. Data available from regional National Weather Stations (NWS) such as Newark Airport, LaGuardia and Kennedy Airports can be used to complement the localized data but is likely NWS data may not always representative of conditions in and around the 130 Liberty Street site. A meteorological station will be deployed in the immediate vicinity of the site. The actual station will initially be located at roof top level at the deconstruction site.

The on site meteorological station will be connected directly to the computer station situated at ground level. Data will transmitted continuously and recorded as 5-minute average values. Data from the roof top station will be logged continuously at the unit's data logger and also transmitted via telemetry to the street level computer station.

The meteorological monitoring component of the air sampling and monitoring program will consist of equipment designed to continuously record wind speed, wind direction, standard deviation of wind direction, precipitation, and air temperature from a 10-foot tripod or roof mount tower. Monitoring will be done from the roof of the building at 130 Liberty Street until deconstruction activities warrant its physical removal when the roof is removed or access is denied due to ongoing construction activities. The 130 Liberty Street roof mounted station, will then be collocated with one of the air monitoring stations..

Meteorological variables and their importance in air quality modeling and ambient air monitoring is provided below as follows:

- Wind Speed: The wind speed is a major determinant of the travel distance and travel time of the contaminant. For example, in the air quality models, concentration is inversely proportional to the wind speed. Wind speed also affects the volatilization of contaminants from a work zone and thus influences the ambient air concentrations.

- Wind Direction: The wind direction indicates the direction in which contaminants will be transported. For example, ambient air quality models use hourly averages of wind direction to determine which location specific concentrations. The observed wind directions during ambient air sampling will be used to designate samples as upwind, downwind, or crosswind relative to potential contaminant emissions sources.

- Standard Deviation of Wind Direction: can be used to perform stability calculations for air contaminant transport calculations.

- Barometric Pressure: can be used in the calibration of the high-volume samples.

- Ambient Temperature: The ambient temperature is used in determining the rise of a buoyant plume. A plume rise calculated by an air quality model determines the final height above ground of the centerline of the pollutant plume from a point source. Ambient temperature can be helpful in quantifying the degree of contaminant volatilization.

- Rainfall: rainfall and moisture may have the effect of scrubbing particulates from the air.

The data from the meteorological station units will be recorded by a CSI CR510 digital data logger, and telemetered back via CDMA cellular modems.

8.0 ACTION LEVELS AND MITIGATION MEASURES

A two tiered system will be in place during the entire term of the deconstruction project. This system includes use of both Target Air Quality Levels and USEPA Site Specific Trigger Levels for each of the target parameters identified previously in Section 4. A summary listing of these Action Levels provided on a parameter specific basis is shown in Table 5.

Table 5. Target Air Quality Levels and USEPA Site Trigger Levels[a]

Analyte	Target Air Quality Levels	USEPA Site Specific Trigger Levels
Metals		
Antimony	5 ug/m^3	14 ug/m^3
Barium	5 ug/m^3	5 ug/m^3
Beryllium	0.02 ug/m^3	0.2 ug/m^3
Cadmium	0.04 ug/m^3	2 ug/m^3
Chromium	0.6 ug/m^3	60 ug/m^3
Copper	10 ug/m^3	100 ug/m^3
Lead	1.5 ug/m^3	5 ug/m^3
Manganese	0.5 ug/m^3	0.5 ug/m^3
Mercury	0.3 ug/m^3	3 ug/m^3
Nickel	0.2 ug/m^3	28 ug/m^3
Zinc	16 ug/m^3	160 ug/m^3
Particles and Dust		
Asbestos	0.0009 f/cc (PCMe fibers)	70 S/mm^2 (TEM AHERA structures)
Particulate PM_{10} (24 hour average)	150 ug/m^3	150 ug/m^3
Respirable Silica (crystalline)	10 ug/m^3	10 ug/m^3
Organics (semi-volatiles)		
Dioxins/Furans (2,3,7,8 – TCDD equiv.)	0.00025 ng/m^3	0.025 ng/m^3
PCB (total Aroclors)	0.12 ug/m^3	12 ug/m^3
PAH (benzo-a-pyrene equivalent)	0.034 ug/m^3	3.4 ug/m^3

[a]All values listed in Table 5 are consistent with Target Air Quality Levels and USEPA Site Trigger Levels adopted for use during 4 Albany Street deconstruction project. As such these levels represent USEPA/NYDEC sanctioned values.

8.1 Action Levels

The following actions will be taken if there is an exceedance of any Target Air Quality Level. If there is an exceedance of both the Target Air Quality Level and USEPA Site Specific Trigger Level, actions associated with the USEPA Site Specific Trigger Level will govern.

8.1.1 Target Air Quality Levels

Any 24-hour PM_{10} value in excess of the Target Air Quality Level will be considered an "exceedance" and the actions described below will be taken.

Any sample of an analyte, other than PM_{10}, in excess of 3 times the Target Air Quality level for that analyte will be considered an exceedance and the actions described below will be taken.

Following the first week of sampling, a cumulative average will be established based initially on the first week's results, to which will be added daily values as results are received from the laboratory.

Exceedance of an established target Air Quality Level for any analyte calculated as shown above will result in an evaluation of engineering controls and work techniques in the source area. This evaluation shall include but not be limited to the evaluation of work activities that may be causing the exceedance, smoke testing of the isolation barriers in question, and inspection and repair of any faulty isolation barriers.

8.1.2 USEPA Site Specific Trigger Levels

Any 24-hour value (work shift value on days or four hour value on non-work days in the case of asbestos) in excess of the USEPA Site Specific Trigger Level will be considered an "exceedance" and the actions described below will be taken.

Exceedance of USEPA Site Specific Trigger Levels will result in a stoppage of work associated with the exceedance until an evaluation of emission controls is performed and corrective action is in place. The USEPA Site Specific Trigger Levels are applicable to individual sample results. If any of the individual sample results exceed an USEPA Site Specific Trigger level, then notification must be made to the USEPA Region 2, NYCDEP, NYSDOL and NYSDEC. Work will be reinitiated once the USEPA Region 2 has agreed (and NYSDOL during the Abatement Phase in the case of asbestos exceedances) to the corrective action(s) proposed to prevent the potential for exceedances in future work and such corrective actions have been implemented.

9.0 EXCEEDANCE NOTIFICATION

Notification

The USEPA Region 2, NYCDEP, NYSDEC and the NYSDOL will be notified as promptly as reasonably possible via phone and electronic mail of any exceedance of either a Target Air Quality Level or a USEPA Site Specific Trigger Level and will be notified promptly of any corrective actions taken in connection with a Target Air Quality Level exceedance or an USEPA Site Specific Trigger Level exceedance.

Monitoring Data

All Sampling results collected pursuant to this specification, in suitable electronic form, will be promptly provided to the USEPA Region 2, NYCDEP, NYSDEC and NYSDOL offices weekly and exceedances will be reported as provided above.

10.0 QUALITY ASSURANCE/QUALITY CONTROL

10.1 Overview

The program described herein will be performed by the Environmental Subcontractor under subcontract to Contractor, the overall general contractor for the 130 Liberty Street Deconstruction Project. The Contractor Environmental Subcontractor will assume responsibility for the collection and analyses of all samples identified previously in Sections 5 and 6 of this plan. The Contractor Environmental Subcontractor/Contractor Team will assume responsibility for the quality of all data to be collected in the conduct of the deconstruction project. LMDC in its role as property owner will utilize its independent Environmental Consultant to serve in an oversight role to the Contractor monitoring activities. This oversight role will include additional QA/QC measures to be implemented by LMDC and its consultants to further insure that all monitoring data meet predetermined data quality goals and objectives. A separate document or Quality Assurance Project Plan (QAPP) will be prepared and issued for agency review and comment. This QAPP will provide details on all QA/QC measures to be put in place by the Contractor Environmental Subcontractor/Contractor Team for the deconstruction monitoring program. This QAPP will also identify all of the additional QA/QC measures to be undertaken by the LMDC consultant to fulfill its oversight function for this program.

10.2 Contractor Environmental Subcontractor/Contractor Quality Assurance/Quality Control

The Contractor Environmental Subcontractor/Contractor Team will have primary responsibility for implementation of all program Quality Control measures identified in the QAPP. These will include but not be limited to the following types of QA/QC features:

- Data Quality Objectives
- Detection Limit Goals
- Data Capture Goals
- Chain of Custody
- Calibration Procedures and Frequencies
- Field Blanks
- Lab Blanks
- Collocated Samples
- Matrix Spikes
- Lab Control Spikes
- Lab Method Blanks
- Field Surrogate Spikes
- Lab Surrogate Spikes
- Corrective Action Measures

Elements of QA/QC typically contained in a QAPP are listed in Table 6.

Table 6. Elements Typically Contained in a Quality Assurance Project Plan (QAPP)

Title Page. Should include the name of the document and the date it was prepared. The QA officer should sign the title page, ensuring that field and laboratory personnel are aware of the requirements for precision, accuracy, completeness, representativeness, and comparability.

Table of contents. Includes a listing of the QAPP elements and any appendices, figures, and tables. A list of the recipients of official copies of the QAPP should also be provided.

Project description. Consists of a general paragraph describing the scope of work, general objectives, and required measurements. (If the project description is discussed in the field sampling plan, it does not need to be repeated in the QAPP.)

Proved organization and responsibility. Identifies key field and laboratory personnel or organizations that are necessary for each analytical activity during the study. A table or chart showing the organization and lines of authority should be included. The organizational chart should also include all subcontractors and their key points of contact. The QA officer should be organizationally independent of project management so that the risk of conflict of interest is minimized.

Data quality objectives. Describes the QA objectives for the data so that the data can achieve their intended use. Project-specific data quality objectives that have been identified for the project, short-term decisions that will be made during the project planning phase, and long-term decisions that will be made prior to project closeout should be highlighted.

Sampling locations and procedures. References the sections of the field sampling plan that discuss the general rationale for choosing sampling locations and the sampling procedures proposed for each matrix.

Sample custody and holding times. References the appropriate sections (e.g., sample custody/ documentation) of the field sampling plan for all custody and holding requirements pertaining to the field and laboratory activities.

Sampling and analytical procedures. Identifies the appropriate sampling and analytical test methods that should be used for each environmental sample.

Calibration procedures and frequencies. Discusses the calibration procedures to be used, the number and concentration of calibration standards, and the calibration range and procedures to establish and verify the calibration of instruments.

Internal QC checks. Identifies the specific internal QC methods to be used, including analyses of method blanks; use of laboratory control samples, and use of environmental samples as duplicates, matrix spikes, and duplicates.

Calculation of data quality indicators. Discusses how precision, accuracy, completeness, representativeness, and comparability goals are to be calculated from the project data.

Corrective actions. Addresses corrective actions that must be implemented if QA specifications are not met. Corrective actions could include resampling, reanalyzing samples, or auditing laboratory procedures. Persons responsible for initiating these actions should be identified.

Data reduction, review, validation and reporting. Discusses the data review process that is required to assure the validity of the data. Data reduction procedures should be summarized and the persons responsible for data reduction identified. The format for reporting the data and the data reporting schedule should be specified.

Preventive maintenance. Discusses the preventive maintenance plan that will be implemented to minimize downtime of field and laboratory instrumentation.

Audits. Describes the performance, systems, data quality, and management audits that will be performed onsite and at the laboratory.

QC reports to management. Discusses QC reports that will be prepared. These reports typically include an assessment of accuracy, precision, completeness, representativeness, and comparability; audit results; and significant QA problems encountered.

Source: Design, Installation and Utilization of Fixed-Fenceline Sample Collection and Monitoring System, US Army Corps. of Engineers, EM 200-1-5 – 1 October 1997

10.3 LMDC Oversight Role

LMDC, through its consultants, will conduct specified oversight of the Quality Assurance/Quality Control measures to be implemented by Contractor /Contractor Environmental Subcontractor in performance of the 130 Liberty Street Deconstruction Ambient Air Monitoring Program. The specific responsibilities of LMDC and its consultants will be identified in more detail in the QAPP. These will include but not be limited to the following types of activities and measures:

- Collocated Field Samples
- Data Validation
- Field Systems and Calibration Audits
- Data Quality Audits
- Performance Evaluation Samples (" Blind" Reference Samples NIST/EPA)

11.0 ELECTRONIC DATA MANAGEMENT AND REPORTING

11.1 Data Acquisition Systems

The primary data acquisition system for the continuous monitors and the meteorological system will be the CSI CR510 data logger, or equivalent. The data logger has inputs for 4 single-ended analog channels. Each data channel will be sampled once per second with an accuracy of ± 0.1 percent of full scale. Both 5-minute and hourly averages will be calculated. The data loggers are programmable, and additional information such as maxima, minima, and frequency histograms can be collected.

11.2 Data Management

The current Contractor Environmental Subcontractor has developed an ensemble of systems for electronic data management of nearly all phases of environmental monitoring projects that will be used to manage the collection and reporting of data from this project. These systems, or equivalent for the purposes of this project, will be utilized for the management of data:

- EnviroData® provides a standardized means for porting laboratory electronic data deliverables (EDDs) into Microsoft® Access© databases;
- MonitorFast℠ provides a framework for automated data retrieval from monitoring stations to standardized SQL Server databases either periodically or in real-time;
- FieldFast enables direct electronic entry of field sampling data from the Asbestos, PUF and TSP samplers; and
- TeamLink℠ provides a secure Web-based data access portal and project management tool.

Each of these technologies is described further in Appendix A of this document.

11.3 Reporting

Samples will be shipped overnight to the laboratory the day after the sample period. Please refer to Table 7 for proposed laboratory turnaround times on a parameter specific basis. Data reporting schedules and frequencies are also provided. PAHs, PCB, and D/F's data collected are loaded to the EnviroData® database, or equivalent on Contractor Environmental Subcontractor's server within 48 hours of receipt of the EDD from the laboratory. The data can be viewed in tabular format through the Teamlink℠ Website, or equivalent.

For continuous monitors and the meteorological station, the data loggers will record data at 5minute and 60-minute intervals. The data will be downloaded from the loggers to the databases on a minimum of once daily, and reviewed by the Contractor Environmental Subcontractor Project Scientists. The frequency of data retrieval can be increased in MonitorFast℠ , or equivalent to obtain access to results in near-real time.

A data analysis report will be submitted to Contractor at the end of the program. Data will be stored in a central database in a standard format. The data analysis will review the meteorological, PM, PAH's, PCB, and D/Fs data.

The data collected during the demolition segment of the monitoring program will be primarily used for real-time data display and triggering notification when action levels are exceeded (See Sections 7 and 8). All continuous monitoring data will be archived in Microsoft SQL Server databases maintained on a secure Internet server in the Contractor Environmental Subcontractor's offices.

Basic summary information and real-time displays of the monitoring data will be available interactively on-line. The Website will allow the Contractor Environmental Subcontractor personnel to interactively view the monitoring data via charts, maps, or tables. Reports viewed in tabular format on the Web can also be saved to Excel spreadsheets. Additional required information, such as daily calibration information and wind roses, will also be available on the website.

Authorized personnel from USEPA Region 2, NYCDEC, NYSDEC and NYSDOL will also be provided direct access to the website where all air monitoring data will be posted. In addition, once the air monitoring data has been subject to QA/QC review validated results will also be posted on the website in a dedicated location for direct access by the general public.

11.3.1 Electronic Communication Equipment and Software

As previously described, communications with the CSI data loggers will be via cellular CDMA modems, or equivalent at each station. The loggers will be polled automatically from Contractor Environmental Subcontractor's office and the retrieved data will be automatically uploaded immediately after receipt. Data can be downloaded by users directly to Microsoft® Excel® or Access®.

Table 7. Data Reporting Schedule and Frequency for Each Program Phase			
Analyte	**Lab Turnaround Time (TAT)**	**Reporting Frequency**	**Sample Period**
Background Phase			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	24 Hours
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously
Phase I - Abatement			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	24 Hours
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously
Phase II – Structural Deconstruction			
Metals	3 Days	Every Day	24 Hours
Asbestos	24 Hours	Every Day	Work Shift
Semivolatiles	5 Days	Every Day	24 Hours
Silica	3 Days	Every Day	24 Hours
Real-time PM_{10}	NA	Every Day	Continuous 24/7
Real-time Hg	NA	Every Day	Instantaneously

APPENDIX A
ELECTRONIC COMMUNICATION-SOFTWARE TOOLS

Data Management Program

An environmental data management program will be provided that facilitates the processing of current and historical analytical data collected across multiple work areas. Contractor Environmental Subcontractor will provide analytical sampling results via EDD's compatible to export results to a standardized Microsoft® Access datamart for end-users of the data. The datamarts can be accessed to provide interactive data queries, charting, and summaries.

Automated Data Collection

Contractor Environmental Subcontractor's system will be used to automate data collection from the real-time monitoring network (PM_{10} monitors, as well as the meteorological station) by sending the data via a wireless phone connection to a secure Internet database. The data can then be viewed in real time over secure Web pages in tabular, graphical, and spatial formats. The system architecture consists of three tiers: field data collection, database storage, and Web-based data access and reporting.

The system uses digital data loggers and software for data collection and retrieval. These loggers were described previously and will transmit their data to Contractor Environmental Subcontractor via wireless modems.

Contractor Environmental Subcontractor developed a standard database structure that is the system's foundation for maximizing efficient transfer and management of data. For example, the database uses stored procedures to send e-mail notifications when incoming data trigger alarm conditions, and to warn when data are not received on schedule. Because monitoring data are stored in standardized databases, information retrieval and editing processes are very efficient. Data reside on a secure server that is backed up daily and stored off-site. Through Contractor Environmental Subcontractor's system, data can be manipulated and viewed in real time in tabular, graphical, or spatial formats.

Data Tracking Software

Contractor Environmental Subcontractor will utilize a software program for tracking samples and data, electronically generating chain-of-custodies (COC) and sample labels, data reports, and capturing sample attributes and field parameters. The program operates in tandem with personal computers (generating labels and COCs, and managing the database) and portable digital assistants (PDAs) for collecting data in the field. The Program eliminates most typographical errors in the field and ensures that laboratories and engineering staff can clearly read paperwork and data. Additional data such as field measurements can be exported to various environmental data management systems (EDMS), including Geographical Information Systems (GIS), Microsoft® Access® and Excel®, and more.

Virtual Private Network

The Contractor Environmental Subcontractor will develop a Web-based collaborative workspace that is accessible from a computer with Internet access, a Web browser, and a user account. Project data can be viewed from office or home 24 hours a day. The data can be manipulated and viewed in real time in tabular, graphical, or spatial formats enabling easier reporting of data. charts and data can be imported into other programs such as Microsoft® Excel, Word, and PowerPoint.

Data are secured by Secured Socket Layer (SSL) encryption technology and by individual member IDs and passwords, making the site as secure as an online banking account.
This system will be used to:

- Organize, store, and review electronic files, including documents, photos and video, maps, and data.
- View and query data in tabular and spatial formats.
- Manage project schedules, contractor invoices, resource management, and commitment tracking/scheduling.
- Submit and receive reports and invoices from subcontractors (if requested).

TeamLink℠'s Filing Cabinet provides a project-specific organizational structure for easier management of project documents and includes the following features:

- Multiple Security Levels—Various levels of security control which team, subgroup, or user can view which information.
- Document Response/Review Capabilities—Each document's complete lifecycle can be managed by posting responses/reviews to documents in a threaded hierarchy structure.

Emergency Action Plan
for
Deconstruction Operations
at
130 Liberty Street
New York, NY

Lower Manhattan Development Corporation
One Liberty Plaza, 20th Floor
New York, NY 10006

TABLE OF CONTENTS

SECTION 1 INTRODUCTION

The 130 Liberty Street site is occupied by a 40 story, approximately 1.4 million square foot office building (Building). Interior and exterior portions of the Building were severely damaged and/or impacted as a result of the collapse of the World Trade Center Towers. The Lower Manhattan Development Corporation (LMDC) took ownership of the Building on August 31, 2004.

The deconstruction of the Building shall be performed in the following three (3) phases

- Preparation Phase
- Phase I – Asbestos and COPC Abatement and Removal
- Phase II – Structural Deconstruction

The Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, erection of sidewalk sheds, and the removal of existing netting on the exterior of the building. Phase I is limited to non-structural, interior building deconstruction tasks. Phase I activities include the general cleanup of asbestos and contaminants of potential concern and removal of the interior non-structural components of the building. Removal of the structure is to be undertaken in Phase II. Complete details of the work are contained in the overall Deconstruction Plan for 130 Liberty Street.

SECTION 2 PURPOSE

This EAP is designed to lessen the impact of any emergency that might occur during the deconstruction process through proper planning and the establishment of a suitable response structure. The Plan designates the appropriate personnel responsible for implementing and monitoring the EAP and identifies those who need to be contacted in the event of an emergency. It outlines the education and training required by all on-site personnel so that all understand the requirements and expectations of the EAP.

This EAP will apply to all contractors working on the site (e.g. Contractor, Abatement Subcontractor, Environmental Consultant, Demolition Subcontractor, Mechanical Subcontractor, Electrical Subcontractor, etc.), their employees and any visitors to the site.

SECTION 3 LOCATION OF PLAN

A copy of this EAP will be provided to LMDC, all Contractor employees working at the Building, and all subcontractors working on the site. It will be available at all field offices, the Building Security Desk and at the entrance to the remote personnel decontamination unit located in cellar "A" as indicated in Section 4 (Asbestos and COPC Abatement and Removal Plan) of the Deconstruction Plan. It will also be provided to the

following city, state and federal governmental agencies: New York City Fire Department (FDNY), Police Department (NYPD), Office of Emergency Management (OEM), Department of Buildings (DOB), Health Department (DOH), Department of Environmental Protection (DEP), Department of Transportation (DOT), (collectively "the City Agencies"); New York State Department of Health (NYSDOH), New York State Department of Labor (DOL) and Department of Environmental Conservation (DEC); and the United States Environmental Protection Agency (EPA) and Occupational Health and Safety Administration (OSHA) (in total, the "Governmental Agencies") .

Any questions concerning this plan should be directed to Kate Millea, LMDC Project Manager, Community Development and Relations, 212-962-2300.

This EAP will be revised as necessary during the course of the project. All revisions will be marked by date and revision number and conveyed to all on-site personnel, the Governmental Agencies listed above and to LMDC for distribution as appropriate.

The EAP will also be accessible on the LMDC website, www.renewnyc.com.

SECTION 4 CONTRACTOR EMERGENCY COORDINATOR

The current interim Emergency Coordinator is listed in Attachment A. Attachment A will be updated and information provided as project staffing changes. The Contractor Emergency Coordinator holds a current New York City Site Safety Manager (NYCSSM) license and has extensive training and experience in the execution of similar work in New York City. The contact numbers are indicated in Attachment A. These are the primary Contractor emergency contact phone numbers, and both are 24-hour contact numbers. The Contractor Emergency Coordinator's base of operations will be the Contractor's field office (trailer).

In the event that the Contractor Emergency Coordinator is not on site, an alternate Contractor Emergency Coordinator will be designated and will be responsible for ensuring proper implementation of this EAP. The name and contact information of the alternate Contractor Emergency Coordinator will be provided to LMDC and all Subcontractor Emergency Coordinators.

The Contractor Emergency Coordinator has overall responsibility for this EAP and will ensure
that all required activities of the EAP are met. In addition the Contractor Emergency Coordinator has the lead role in directing all responses to circumstances covered under this EAP. Further, the Contractor Emergency Coordinator will be the liaison to the First Responder agencies for pre-planning collaboration, regular contact throughout the work, notifications and for coordinating the Contractor's support of any agency response to an emergency. Further details of the responsibilities of this role are outlined throughout this EAP.

SECTION 5 PRE -EMERGENCY RESPONSE ACTIVITIES

5.1 Pre-Planning

The following actions below will be implemented prior to the initiation of the deconstruction activities to minimize the potential for incident occurrence and to ensure proper preparation for emergency response if needed.

- Prior to the commencement of work activities, the Contractor Emergency Coordinator will meet with appropriate representatives from the City Agencies to:
  - present and discuss the EAP;
  - discuss any required collaborative preparation (practice drills, etc.); and
  - ensure they are informed regarding existing building conditions as well as the potential for the removal of contaminated victims.
- A complete set of Building drawings will be available within the Contractor field office (trailer) and LMDC's office located at 1 Liberty Plaza for use in an emergency situation. Copies of the drawings will also be provided to FDNY and DOB. As conditions change within the building that may impact egress patterns, updated information will be added to the building drawings and provided to FDNY and DOB. Note: The Contractor will ensure drawings indicate the location of all elevator operations and panels as well as all Fire Department connections.
- All Subcontractors will provide to the Contractor the names, contact information and any required training documentation for the individuals they propose to fulfill the roles of the subcontractor Emergency Coordinator (and substitutes).
- A schedule for regular emergency preparedness meetings will be established by the Contractor Emergency Coordinator. Attendance by all Subcontractor Emergency Coordinators is required. The LMDC and First Responder agencies shall be informed of the meeting schedule in advance so they have the opportunity to attend as desired.
- Emergency points of contact list will be posted within the Contractor's Field Office (see Appendix A), the Building Security Checkpoint Desk and at the entrance to the remote personnel decontamination unit.
- Site evacuation maps will be posted throughout the facility for emergency evacuation (see Appendix D). Exits will be clearly marked, and signs reflecting changing egress patterns as the works proceeds will be prominently posted.
- First aid kit(s) will be placed within the Contractor's field office and the Building Security Checkpoint Desk. An automated external defibrillator (AED) will be located within the Contactor field office**.**
- Rally points or meeting places have been established and are shown on the evacuation map (see Appendix C).

- The Contractor will ensure that all subcontractors that have an on-site field office trailer have placed at least one (1) fire extinguisher in each trailer.
- The Contractor will ensure fire extinguishers will be strategically positioned at designated locations within the Building as required by governing regulations. Note: the Contractor shall insure that all portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970.
- The Contractor will ensure that a system is in place to track site personnel and visitors to provide an accurate site head count at any moment in time.
- An audible evacuation signal compliant with the most stringent regulatory requirements will be established and tested daily with documentation of each test recorded within the project log by the Contractor Emergency Coordinator.
    - Two (2) long blasts of the site air horn will sound through a temporary radio communication system to be installed and maintained by the Demolition Subcontractor. To ensure the evacuation alarm is audible throughout the Building, a loudspeaker will be strategically positioned on each floor.
    - This audible evacuation signal will be tested daily by the Contractor Emergency Coordinator or his designee and the performance of this test documented in the project log.
    - The Contractor Emergency Coordinator will notify LMDC in advance of the drills so that appropriate community notification can be given consistent with the Community Notification Plan, attached as Appendix F.
    - At the conclusion of the test each day, all Subcontractor Emergency Coordinators will poll their personnel to ensure the alarm was audible in all locations and report back to the Contractor Emergency Coordinator.
    - Corrective measures, if necessary, will be implemented immediately.
- All communications systems will be tested prior to the commencement of any work activities.
- Steam and Gas are being disconnected and capped in the street. The remaining utilities will be cut and capped in the street as necessary, i.e., water, electric and sewer. The Contractor will coordinate access to the site for Con Edison.

5.2 Training

5.2.1 Contractor Emergency Coordinator

The Contractor's designated Emergency Coordinator shall hold a current NYCSSM license. The Contractor shall insure that its Emergency Coordinator or a designated representative has been trained in the OSHA Disaster Site Worker Outreach Program.

5.2.2 Subcontractor Emergency Coordinators

Prior to deconstruction activities, all subcontractors working on the site will identify an Emergency Coordinator and one alternate who will be responsible for the performance of emergency preparedness responsibilities as outlined herein, including coordinating the emergency evacuation of their personnel. In addition, the subcontractor emergency coordinator will be required to assist the Contractor Emergency Coordinator with the dissemination of information relating to an emergency.

All designated Subcontractor Emergency Coordinators shall have successfully completed the
OSHA 30 hour course and must provide the Contractor with proof of this certification.

All subcontractors working on the site shall have a minimum of one (1) Red Cross Certified
First Aid trained individual on the site at all times. Training will include basic first aid, CPR, OSHA blood-borne pathogens, and use of an AED. A list of names with copies of their certifications must be provided to the Contractor at time of mobilization.

In addition, on a daily basis, each Subcontractor Emergency Coordinator will be required to designate one foreman and/or superintendent per active work floor to serve as an evacuation coordinator. In the event of an evacuation, this evacuation coordinator will be responsible for ensuring the complete evacuation of their personnel from the floor for which they have responsibility. This evacuation coordinator will be required to maintain a head count of the personnel under their supervision.

5.2.3 All Site Personnel

Prior to the start of on-site activities, all site personnel will be required, at a minimum, to attend the following site-specific safety orientations:

- Contractor on-site Construction Safety orientation
- Contractor Health and Safety Plan orientation
- Contractor Emergency Action Plan orientation
- Job Hazard Analysis (JHA) specific training - to be provided by the applicable trade
  Subcontractor

All such training will be documented by the applicable training provider. Signed copies of all orientation attendance sheets, EAP acknowledgement forms and HASP acknowledgment forms must be provided to the Contractor and will be maintained on site within the Contractor's field office.

If site conditions warrant a modification to the EAP, all personnel working on the site will be informed of these changes either at a general site safety orientation conducted by the Contractor or at the individual subcontractors' required weekly toolbox talks. All personnel will be required to sign an attendance sheet acknowledging the EAP modification.

5.2.4 Drills

The Contractor Emergency Coordinator will be responsible for setting up and coordinating spontaneous drills of this Emergency Action Plan. For the duration of the deconstruction work, such spontaneous drills involving all occupants of the building will occur as warranted. The Contractor Emergency Coordinator will notify LMDC in advance of the drills so that appropriate community notification can be given consistent with the Community Notification Plan, attached as Appendix F.

5.3 Emergency Response Coordination

The Contractor Emergency Coordinator will function as the on-site representative to the First responders (e.g. FDNY, NYPD, etc.) in the event of an emergency. The main security check point at the Building, located at Washington and Albany Streets, has been designated as the location for first responders to meet the Contractor Emergency Coordinator to be briefed on the scope and nature of the emergency. During an emergency which requires activation of this Emergency Action Plan the Contractor Emergency Coordinator will be clearly identified by means of a reflective vest. This vest will prominently display the words Contractor Emergency Coordinator on both the front and back.

As part of pre-planning activities the Contractor will meet with the City Agencies prior to the commencement of any work. The Contractor will provide the City Agencies with information on the type and location of hazardous materials that may be in the Building. By providing this information prior to the commencement of work activities, the First responders will be able to address any special PPE requirements necessary for conducting emergency rescue services within the Building.

The Contractor Emergency Coordinator will obtain Site Personnel logs from each Subcontractor Emergency Coordinator on a daily basis by 7:30am. These will be updated throughout the day as personnel arrive at or leave the site. These logs will be used by the Contractor Emergency Coordinator in the event of an emergency to account for all trade personnel.

SECTION 6 EMERGENCY RESPONSE MEASURES

This section describes the actions that will be taken in the event of an on-site emergency to minimize the effect of that "event" or emergency on on-site personnel, the neighboring community and the environment.

6.1 Reporting Emergencies

All site personnel, upon discovering an emergency situation, shall immediately call 911. The Contractor Emergency Coordinator shall be notified immediately thereafter and will assume responsibility as the onsite representative to the First Responders.

The Contractor Emergency Coordinator shall immediately notify LMDC. LMDC, will, as necessary activate the community notification plan. Refer to Appendix F for Community Plan. Refer to Appendix A for a copy of the point of contact flow chart.

6.2 Building Evacuation

Any explosion, regardless of size or type, any structural failure, fires and certain power failures will require a complete building evacuation. 911 will be notified in the event of an evacuation.

6.3 Designated Assembly Area
In the event of an evacuation the designated assembly points for site personnel are:

- #1 – Edgar Street between Trinity Place and Greenwich Street
- #2 – Southwest corner of Rector Street and Washington Street

During the EAP orientation, all personnel will be instructed to locate and assemble in a manner that will not impede the operations of any business or agency in the area.

No visitors or trade personnel shall leave the assembly point until directed by the Contractor Emergency Coordinator. Following an evacuation, nobody shall be allowed to re-enter the
Building until cleared by appropriate First Responder, safety, agency or technical personnel investigating the impact of the incident to the Building. The Contractor Emergency Coordinator will provide the "all clear" signal to the Subcontractor Emergency Coordinators once it is safe to return to normal work operations.

6.4 Site Evacuation Process

The Contractor Emergency Coordinator will be responsible, in conjunction with the applicable
Subcontractor Emergency Coordinators, to initiate the following procedures.

The Contractor Emergency Coordinator will:

- Call 911
- Signal the audible evacuation alarm (two (2) long blasts of the site air horn will sound through the Building's temporary radio communication system).
- Contact all Subcontractor Emergency Coordinators via cellular phone and/or site radio system to inform them of the nature and location of the emergency and the actions being initiated including whether it is safe for personnel evacuating the Building to decontaminate.
- Retrieve the daily Visitor Logs and daily Site Personnel Log
- Designate a Contractor employee to account for all logged visitors at the assembly points, the Contractor Security Detail will manage entry and exit to site. Overall

accountability will be the responsibility of the Contractor Emergency Coordinator.
- Support and coordinate with First Responders as directed/requested

The Subcontractor Emergency Coordinator will:

- Secure all manpower (e.g., safely stop work)
- Secure all operating equipment
- Assist in the removal of personnel under their supervision from the Building (the designated evacuation coordinators shall perform a sweep to ensure that everyone has left their floor of responsibility before exiting the floor themselves)
- If conditions allow, ensure all personnel properly decontaminate
- Ensure personnel under their control proceed to the closest assembly point and remain there to await further direction
- Conduct a head count of their personnel at each location

6.5 Surrounding Community Notification

The Contractor Emergency Coordinator will immediately notify LMDC of an emergency situation resulting in the implementation of any aspect of this EAP. In emergency situations where First Responders will assume control, all community notifications will be coordinated with the First Responders Incident Commander. In situations where that is not the case, LMDC will determine and implement appropriate notification to the community pursuant to the Community Notification Plan attached as Appendix F. The Contractor Emergency Coordinator will advise, cooperate, participate, assist and provide support as requested by LMDC in community notification efforts.

6.6 Key Agency Notification

In the event of an emergency situation resulting in the implementation of any aspect of this EAP, LMDC will notify the appropriate Government Agencies as warranted by the situation.

SECTION 7 RESPONSE TO SPECIFIC EMERGENCY EVENTS

Below is a list of unplanned events that may occur during the deconstruction project. This list may not be all encompassing, but represents "events" related to similar projects. These events include:

- Fire or explosion
- Power failure
- Structural failure
- Unplanned, sudden or non-sudden release of hazardous waste or constituents
- Worker injury or illness
- Falling or dropped building debris
- Work Stoppages or demonstrations.

7.1. Fire or Explosion

In the event of an explosion or a fire, the Contractor Emergency Coordinator shall immediately:

- Call 911
- Meet First responders at the predesignated location (unless circumstances dictate otherwise, it is the security desk at the Building) for briefing on the scope and nature of the emergency
- Notify LMDC

7.2 Power Failure

In the event of a power failure, the Contractor Emergency Coordinator shall immediately:

- Call 911, if warranted
- Notify on site Electrician to evaluate issue
- Start Emergency Generator
- Coordinate with the Abatement Subcontractor Emergency Coordinator to initiate containment isolation activities (e.g. both the Personnel and Waste Load Out Decontamination units must be immediately sealed to prevent a fiber release).
- Coordinate with the Abatement Subcontractor Emergency Coordinator to initiate back-up power generation.
- All containment isolation barriers are to remain secure until the required negative pressure has been re-established.

7.3 Structural Failure

In the event of a structural failure, the Contractor Emergency Coordinator shall immediately:

- Call 911
- Initiate Emergency Action Plan, including Building evacuation procedures

7.4 Unplanned Release of Hazardous/Regulated Waste

In the event of an unplanned release of a hazardous and/or regulated waste, the Contractor
Emergency Coordinator shall, in conjunction with the responsible party, the Environmental
Consultant, and others as appropriate shall make a determination whether to implement a Building evacuation or control and remediate the release. No untrained personnel shall attempt to remediate any release of hazardous/regulated wastes. Specific procedures for notification to the appropriate regulatory agencies and remediating any releases are addressed in the Deconstruction Plan.

In accordance with the New York State Asbestos Rules, if visible emissions occur outside the work area or any air sample within the building but outside the work area indicates a level of fiber concentration at or greater than the 0.01 fibers per cubic centimeter or background levels, work shall stop for inspection and repair of barriers and clean-up of surfaces. Any barriers disturbed will be restored, and clean up of surfaces outside the work area using HEPA vacuums and/or wet-cleaning methods, shall be performed prior to the resumption of abatement activity. Work will not resume until the onsite Environmental Consultant verifies that appropriate corrective actions have been taken. Airborne levels of asbestos fibers outside the work area will be closely monitored to ensure that they are below background /action levels.

In addition, this project will have in place an exterior air sampling program, as presented in Section 2- Ambient Air Monitoring Program of the Deconstruction Plan. Per this plan, the USEPA Region 2 office, NYCDEP, NYSDEC and the NYSDOL will be notified promptly of any exceedance of either a Target Air Quality Level or a USEPA Site Specific Trigger Level and will be notified of any corrective actions taken in connection with the Target Air Quality Level exceedance and the implementation of corrective actions in connection with USEPA Site Specific Trigger Level exceedance.

If exterior ambient air monitoring detects any potential contaminants of concern (COPC) as identified within Section 2 (Ambient Air Monitoring Program) of the Deconstruction Plan above the USEPA Site Specific Trigger Levels, all work within the Building will stop and the USEPA Region 2, NYSDOL and NYSDEP will be notified with regards to the exceedance and the implemented corrective measures. Work will not start until a cause of the release has been determined and corrective measures have been undertaken.

For any releases of hazardous/regulated wastes to the exterior of the Building, the Contractor Emergency Coordinator shall call 911. LMDC will also notify EPA, NYSDOL, DEP, OSHA, DEC and DOB.

7.5 Medical Emergency and Rescue

Potential injuries that may result in a medical emergency include:

- Slips, trips, falls, lacerations
- Trauma injuries caused by being struck by heavy equipment, building components, waste containers, etc.
- Eye injuries
- Burns from electrical, fire or explosion
- Electrical contact or electrocution
- Heat stress/stroke
- Chemical exposures
- Cardiac emergencies
- Respiratory emergencies

The Contractor and its subcontractors will respond to minor injuries requiring first aid only; major injuries or requirements for search and rescue will be handled by First Responders.

If a worker is showing signs of distress or obvious injury or illness, the applicable trade Subcontractor Emergency Coordinator shall immediately notify the Contractor Emergency
Coordinator and provide the following information:

- Location of victim
- Nature of Emergency
- Whether the victim is conscious
- Specific details regarding the injury or illness
- Whether the victim is in need of decontamination

The Contractor Emergency Coordinator will suspend work within the immediate area until the emergency situation has been corrected. If possible the subcontractors' first aid attendant shall treat the injured employee as necessary until a decision is made to seek outside medical assistance or to remove the victim from the Building.

The Contractor Emergency Coordinator will be responsible for calling 911 and will inform the
First Responders whether asbestos abatement activities are taking place within the Building, and whether or not the injured employee has been brought through the decontamination chamber.

Upon arrival at the Building, qualified First Responders will make a decision to enter into the project work area or request that the applicable Subcontractor Emergency Coordinator and personnel remove the victim from the Building. In addition, the qualified First Responder will determine the extent of emergency decontamination to be performed, if any, depending on the severity of the injury or illness. If the injury or illness is such that emergency decontamination of the victim cannot be performed safely, the victim shall be given necessary first-aid treatment and wrapped in a blanket prior to transportation to emergency medical services.

7.6 Falling or Dropped Building Components

This section will address procedures that must be followed in the event that any building component(s), construction material(s), equipment, etc. has either unintentionally been dropped, falls or has the potential to fall from the building:

- Call 911 if warranted
- The applicable Subcontractor Emergency Coordinator must immediately notify the Contractor Emergency Coordinator either verbally or via cellular telephone.

- The Contractor Emergency Coordinator shall immediately contact LMDC via cellular phone and verbally inform them of the situation as well as the corrective measures. LMDC will notify DEP, NYSDOL, EPA, OSHA and DEC.
- The Contractor Emergency Coordinator will contact NYC Department of Buildings.

7.6.1 Protective Measures in Place

The following protective measures are currently being utilized at the site to reduce risks associated with the potential for building components to drop/fall from the Building:

- Plywood construction fence to restrict site access
- Sidewalk closures and/or installation of overhead protection
- 24/7 security guards on-site (fire watch activities, general site security around the Building perimeter, Building access)
- Survey of building exterior and selective removal of spandrel glass in danger of falling from building.

The Contractor Emergency Coordinator (or other Contractor designee) will be responsible for ensuring these protective measures remain intact and implementing any corrective measures.

SECTION 8 EAP INVESTIGATION AND REPORT

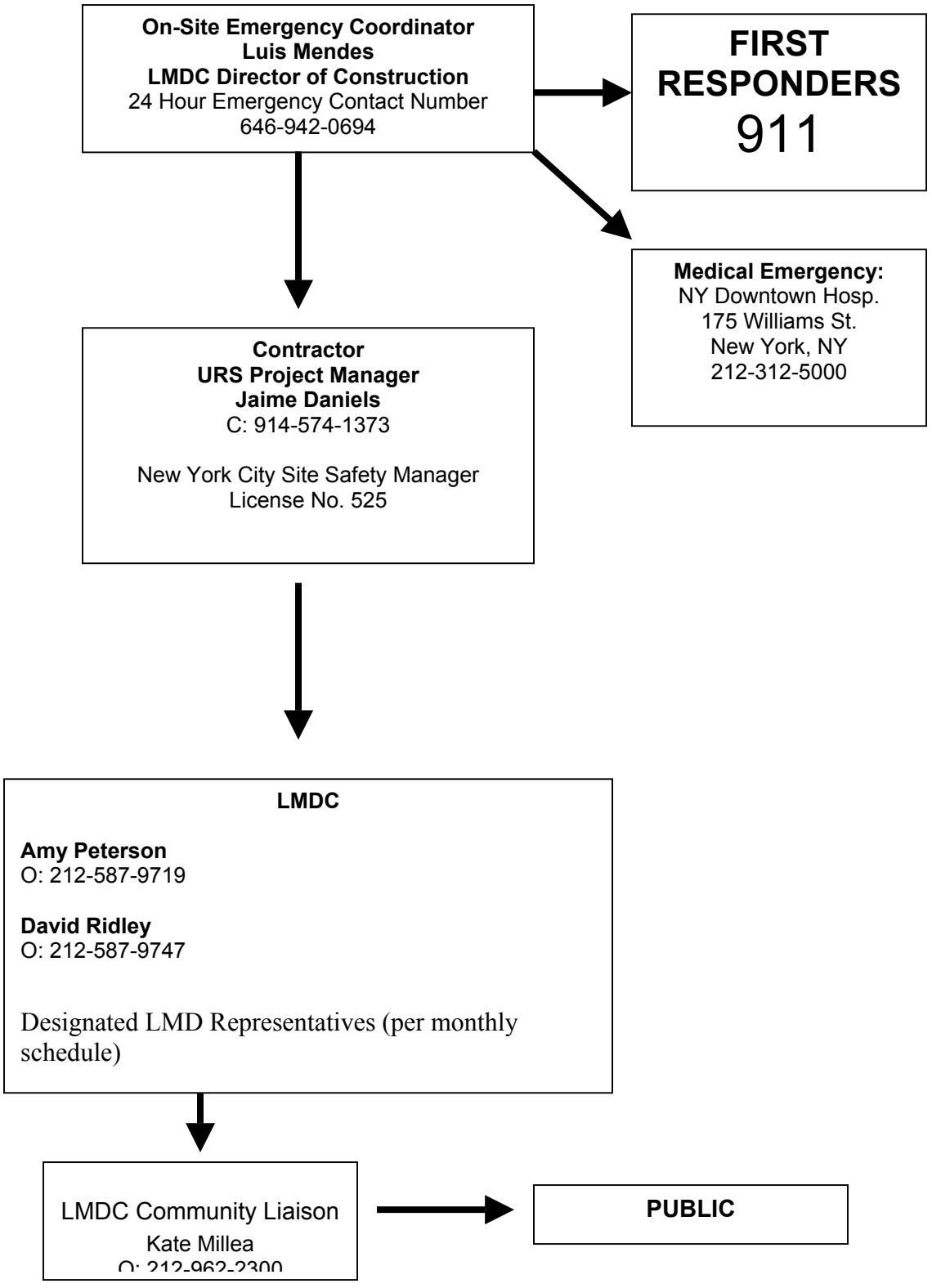
The Contractor Emergency Coordinator in conjunction with the involved trade contractor shall commence an investigation immediately after stabilization of the emergency. The Contractor standard protocols for accident investigation shall be followed. The details of the investigation procedures are contained within the standard protocol. The Contractor will cooperate and assist any agency also investigating the incident.

Within twenty-four (24) hours of the emergency a review meeting will be held. This review meeting will include an evaluation of the emergency, response to the emergency action and, if necessary, address the need to modify any emergency action protocols. The applicable trade contractors will be required to prepare a written analysis of the emergency as well as provide recommended corrective measures. The Contractor Emergency Coordinator will use this information to prepare the report which shall be submitted to LMDC within forty-eight
(48) hours of the review meeting. Implementation of any corrective measures shall take place immediately. LMDC will be informed of all investigation related events in advance so they have the opportunity to attend as they deem appropriate.

If warranted community briefings will occur as outlined in the Community Notification Plan at Appendix F.

APPENDIX A

EMERGENCY RESPONSE COMMUNICATION CHART



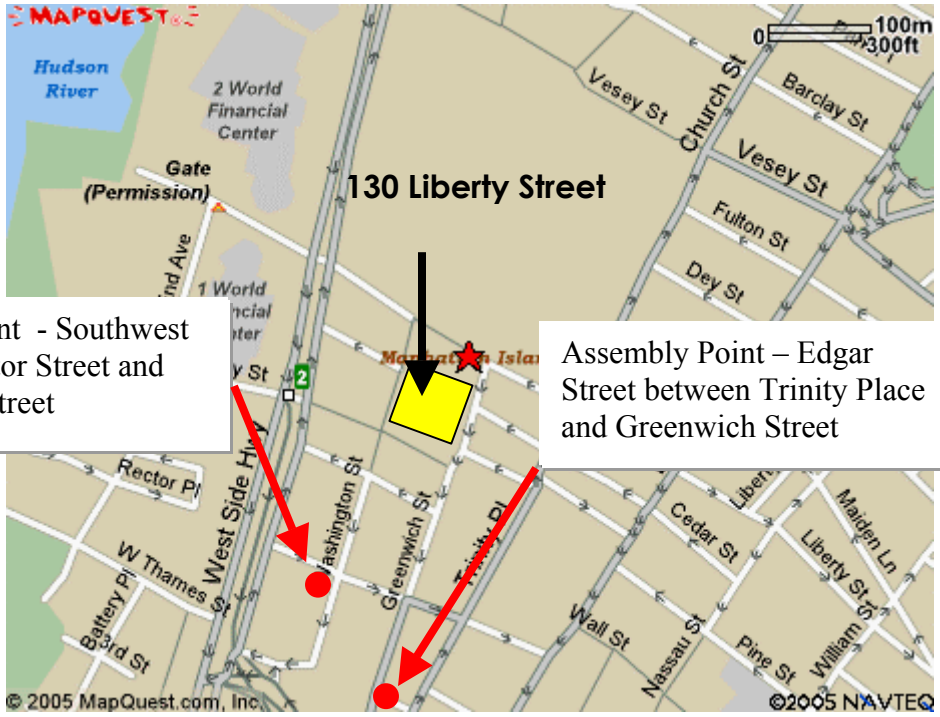
APPENDIX B

Agency Contact Information

MEDICAL EMERGENCY NYU Downtown 69 Gold St # 15f New York, NY 212-312-5108	**POLICE DEPARTMENT** 1st Precinct 16 Ericsson Place New York, NY 10013 212-334-0611
BURNS The NY Hospital--Cornell Medical Center 525 East 68th Street New York, NY 212-746-5454	**US DEPARTMENT OF LABOR (OSHA)** Gil Gillen 345 Hudson Street New York, NY 10014 212-337-2337
EYE INJURY New York Ear & Eye Infirmary 310 E. 14th Street New York, NY 212-598-1313	**DEPARTMENT OF BUILDINGS (NYC)** Robert Lulo 280 Broadway New York, NY 10014 Emergency number: 212-566-3364
AMBULANCE—FDNY Telephone number: 911	**ADM. CHIEF INSPE.: (B.E.S.T. SQUAD)** Rudy Hahn 210 Joralemon Street, Room 819 Brooklyn, NY 11201 718-802-3713
FIRE DEPARTMENT EMERGENCY Dispatch: 212-628-2900 or 911	
NYS DEPT. OF ENVIRONMENTAL CONSERVATION Richard Fram 11-15 47th Ave. Long Island City, NY 11101 718-482-4944	**US ENVIRONMENTAL PROTECTION AGENCY** Pat Evangelista ORA/NYC RRO, Region 2 290 Bdwy, 26th floor NY 10007-1866 212-637-4447
NYS DEPARTMENT OF ENVIRONMENTAL PROTECTION Krish Radhakrishnan. 59-17 Junction Blvd. 8th floor Flushing, NY 11373-5108 718-595-3721	**NYS DEPARTMENT OF LABOR** Christopher G. Alonge, P.E. State Office Building Campus Albany, NY 12240 212-337-2338

APPENDIX C

130 Liberty Street
Emergency Evacuation Assembly Locations

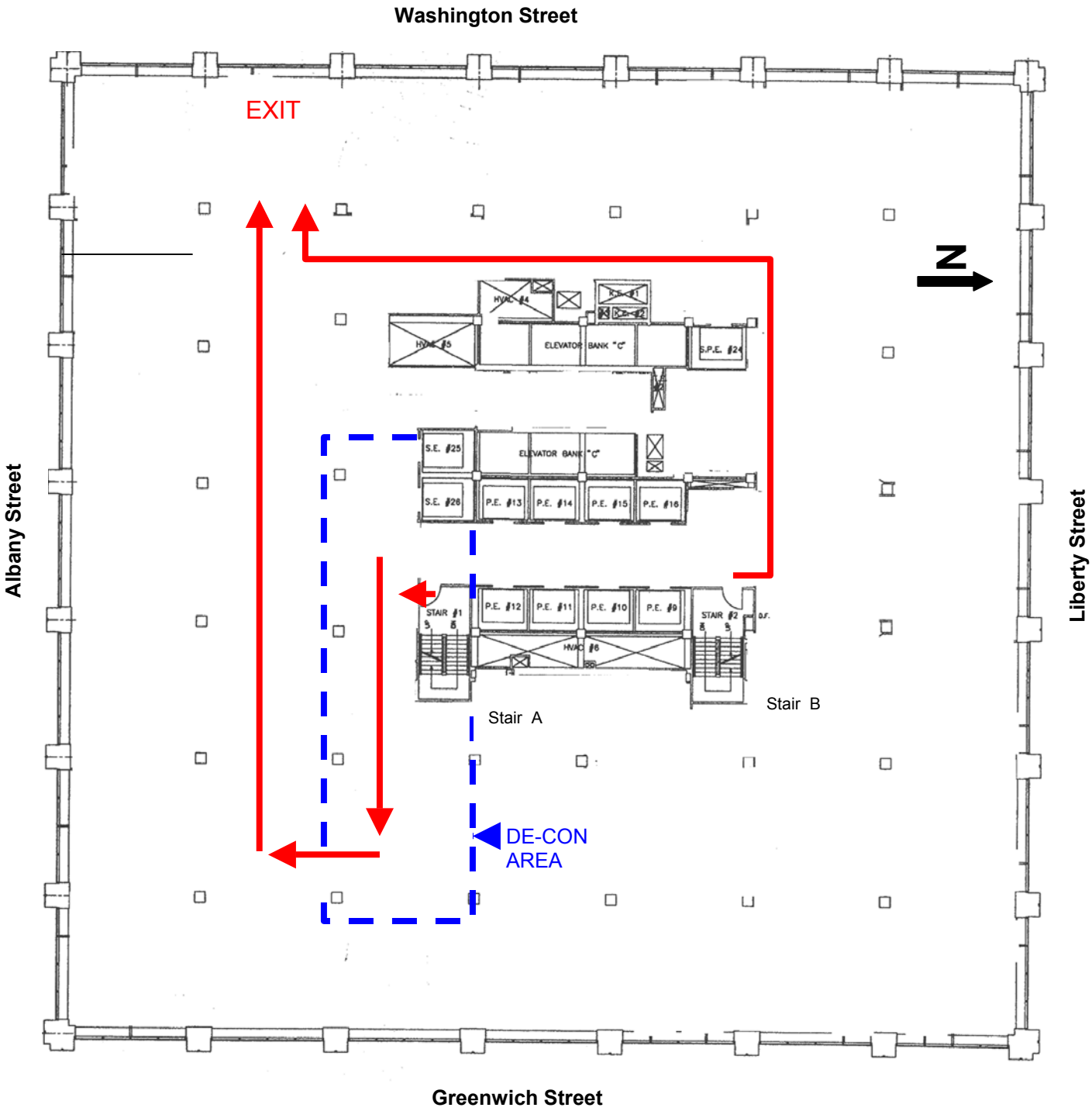


Assembly Point - Southwest corner of Rector Street and Washington Street

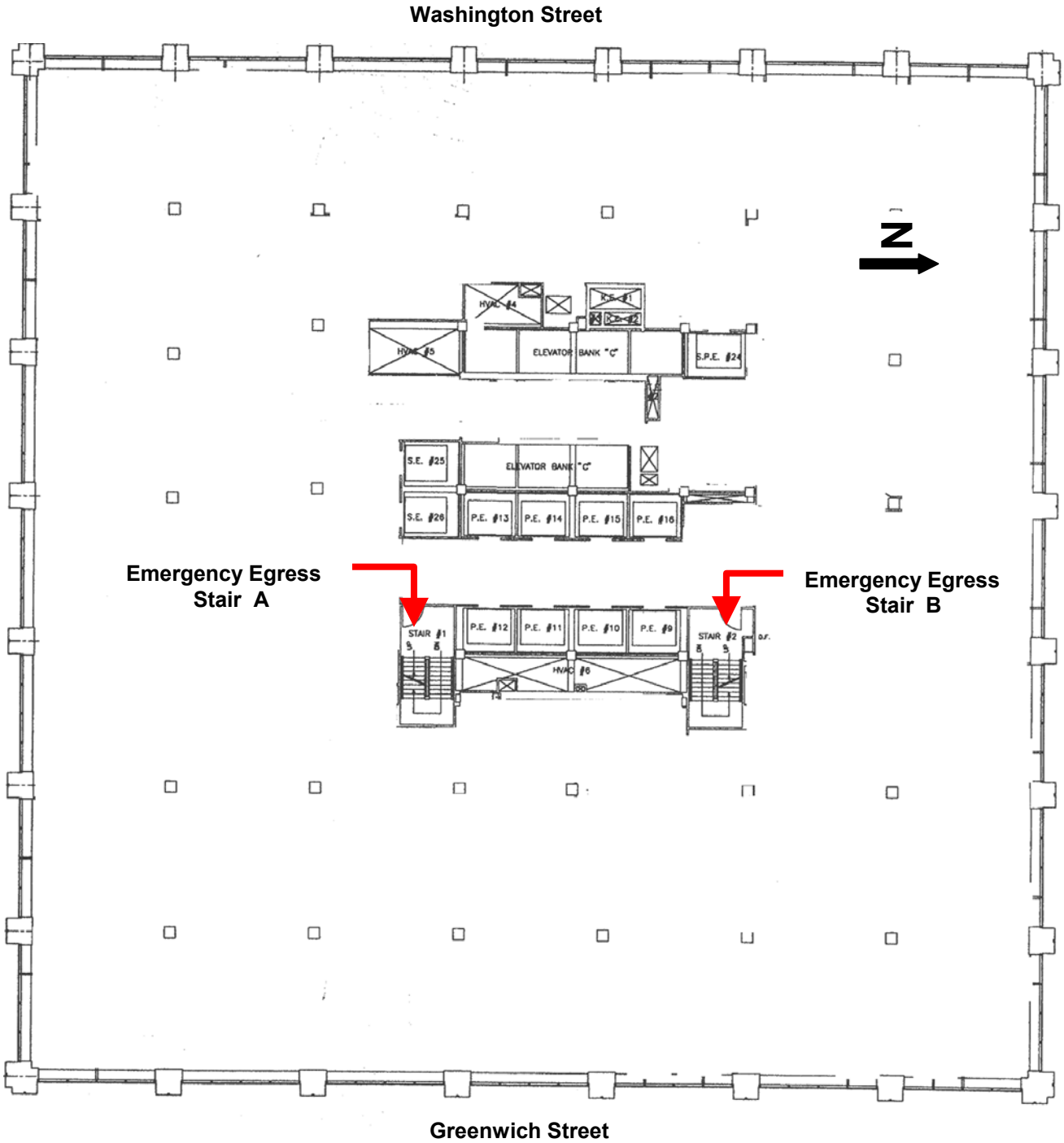
Assembly Point – Edgar Street between Trinity Place and Greenwich Street

APPENDIX D

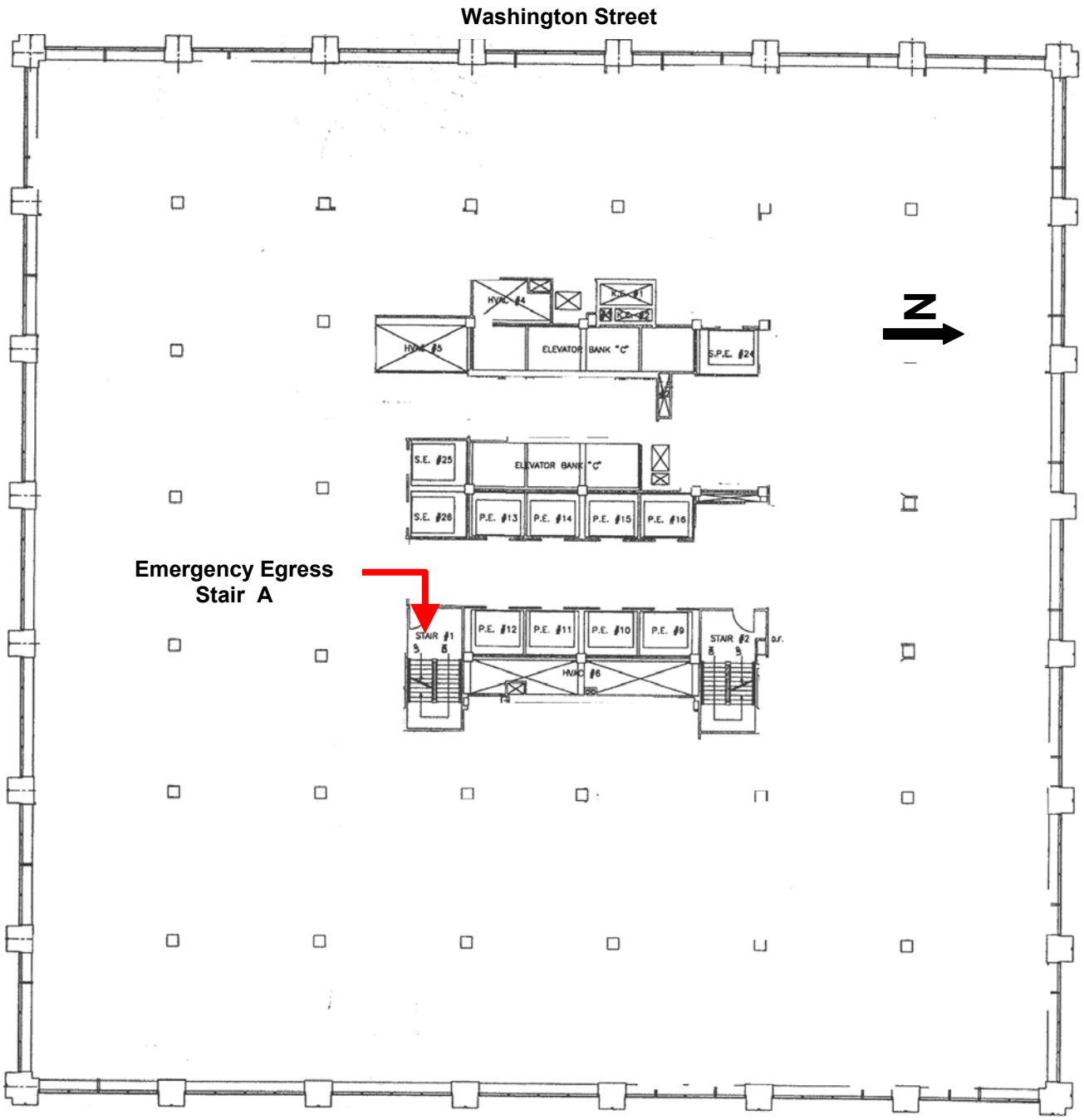
Emergency Egress from Building
Ground Floor Layout



Emergency Egress from Building
Typical Floor Layout - Floors 1 thru 24



Emergency Egress from Building
Typical Floor Layout - Floors 25 thru 39



*** Standpipe is located in Stair A**

APPENDIX E

Hospital Directions With Route Map

Hospital Directions

When an injury occurs, the on-site Gilbane Emergency Coordinator (or their designee) shall determine the response actions. If based on the severity of the injury, emergency response personnel shall not be summoned; the injured personnel should be taken to NYU Downtown Hospital, 69 Gold Street, # 15F, New York, NY. The hospital is approximately 0.9 miles from the site. The approximate travel time between 130 Liberty Street and NYU Downtown Hospital is 4 minutes, depending on the traffic. A map showing the route to the hospital is provided below. Directions to the hospital from the 130 Liberty Street are:

1. Start out going SOUTH on GREENWICH ST toward CEDAR ST
2. Turn LEFT onto RECTOR ST
3. Turn LEFT onto TRINITY PL
4. TRINITY PL becomes CHURCH ST
5. Turn RIGHT onto VESEY ST
6. VESEY ST becomes ANN ST
7. Turn LEFT onto GOLD ST

ROUTE TO THE HOSPITAL FROM 130 LIBERTY STREET

Start:
130 Liberty St
New York, NY 10006-1101

End:
NYU Downtown Hospital [212-312-5108]
69 Gold St # 15f
New York, NY 10038

Appendix F
Community Notification Plan Addendum

Community Notification Plan Addendum
to the
Emergency Action Plan
at
130 Liberty Street
New York, NY

Lower Manhattan Development Corporation

One Liberty Plaza, 20th Floor

New York, NY 10006

TABLE OF CONTENTS

The purpose of the Community Notification Plan Addendum to the 130 Liberty Street Emergency Action Plan is to outline the community notification protocol that the LMDC will implement in the event of an emergency incident at the 130 Liberty Street site.

Section 1 Introduction

On December 13, 2004 the Lower Manhattan Development Corporation (LMDC) submitted for regulatory review a Draft Phase I Deconstruction Plan ("Plan") for the cleaning, abatement, and deconstruction of the building located at 130 Liberty Street. The Emergency Action Plan (EAP) for Phase I activities is contained in Section 3 of the Plan. The EAP has been designed to mitigate against and lessen the impact of any emergency that might occur during the deconstruction process through proper planning and the establishment of a suitable response structure. The EAP also designates the appropriate personnel responsible for implementing the EAP and identifies emergency response personnel and agency representatives that need to be contacted in the event of an emergency. It is a required document that is to be implemented by all contractors and consultants and followed by any onsite visitors working on the deconstruction site in the event of an incident.

The LMDC received numerous comments from the regulatory agencies as well as the public on the December 13 Draft Phase I Plan. Subsequently, on May 12, 2005 LMDC provided a revised Draft Phase I Deconstruction Plan for the cleaning, abatement, and deconstruction of the 130 Liberty Street building for regulator review. The May 12, 2005 revised plan incorporates comments that LMDC had received.

Section 2 Purpose of Community Notification Plan Addendum

In response to comments that the LMDC received from the public, the LMDC has developed a Community Notification Plan Addendum to the EAP. The Community Notification Plan Addendum ("Addendum") is a supplement to the EAP and complements the protocols already established by the EAP. It outlines the community notification protocol that the LMDC will implement in the event of an incident at the 130 Liberty site during cleaning and deconstruction activities. The Addendum defines the roles and responsibilities of the LMDC and their contractors, first responder and regulatory agencies, and the public and addresses the necessary protocol for broader community notification concerning on-site incidents. The Addendum is a "living" document and will be revised and updated throughout the duration of the 130 Liberty Street deconstruction project.

The Addendum applies to all businesses, residents, regulatory agencies, and visitors visiting the Lower Manhattan area, defined as the geographic area TBD.

The Phase I Deconstruction Plan, including the EAP and this Community Notification Plan Addendum, is available for review by regulatory agencies and the public and can be viewed on LMDC's website at www.renewnyc.com.

In the event of an incident requiring first response activities, the First Response agencies, the NYC Office of Emergency Management, FDNY, and the NYPD, will be the primary decision makers regarding required immediate response actions to safely contain the incident. All community communications will be coordinated through the Incident Command emergency management system.

Section 3 Roles and Responsibilities

The following paragraphs outline the roles and responsibilities of the on-site Contractor Emergency Coordinator, the LMDC, first responders, regulatory agencies, the local community emergency response team (CERT), and the public during emergency events at the 130 Liberty Street site.

3.1 Contractor Emergency Coordinator

The Contractor's designated Emergency Coordinator has the overall responsibility for implementing the EAP and will ensure that all requirements imposed by the EAP are met. The Contractor Emergency Coordinator is the designated liaison to the First Responder agencies and will immediately notify the designated LMDC representative should an emergency event occur.

3.2 LMDC

Designated LMDC representatives during emergency response actions include the Director of Construction, Construction Project Manager, and Senior Vice President of Memorial, Cultural, and Civic Development. Upon notification of an emergency event by the Contractor Emergency Coordinator, the designated LMDC representative will contact, the LMDC Community Liaison to initiate the emergency communications process. Ms. Millea will maintain an open community notification and communications process by providing information as it becomes available to the surrounding community. This will be accomplished via several mechanisms, described below in Section 4.0.

LMDC staff, with assigned responsibilities under this Addendum, are required to review the EAP and this Addendum in order to be familiar with, understand and be prepared to carry out the procedures contained within it. Appendix A of the EAP identifies key LMDC staff and illustrates initial emergency response communications between on-site deconstruction contractors, the LMDC, and the public.

3.3 First Responders

In the event of an incident requiring emergency response activities, first responder agencies, including the Office of Emergency Management (OEM), New York City Fire Department (FDNY), and the New York Police Department (NYPD), will be the primary decision makers regarding the immediate response actions needed to safely contain the incident. Once the situation has been controlled, the first response agencies will work with the regulatory agencies and LMDC on appropriate protocols for implementing safety measures.

3.4 Regulatory Agencies

The designated LMDC representative will notify the regulatory agencies of an incident occurring at the 130 Liberty Street building (see the Emergency Response Communications flowchart in Appendix A of the Phase I Deconstruction Plan). These agencies include U.S. Environmental Protection Agency, U.S. Occupational Health and Safety Administration, New York State Department of Environmental Conservation, New York State Department of Labor, New York State Department of Health, New York City Department of Environmental Protection, and New York City Department of Buildings. The regulatory agencies will coordinate their necessary expertise regarding particular incidents to ensure that appropriate protocols are followed and incorporated in response to the incident. Regulatory agencies will defer to the first response agencies in the event of a large-scale incident and work with the first responders and LMDC on the protocol for the longer-term response and mitigation.

For additional information on Battery Park City CERT, please visit:

http://www.bpc-cert.org/

Prepare ahead of time by:

- ✓ ***Becoming familiar with your building evacuation plans;***
- ✓ ***Visiting OEM's Ready New York website at www.nyc.gov/html/oem/html/readynewyork/home.html***
- ✓ ***Knowing area emergency phone numbers;***
- ✓ ***Preparing Go Bags; and***
- ✓ ***Preparing emergency supplies.***

3.5 Battery Park City CERT Team

The New York City Community Emergency Response Team is a community-based volunteer organization that informs, educates, and trains community residents about disaster preparedness. In the event of an emergency at the 130 Liberty Street building, the Battery Park City CERT team will assist first response agencies by providing emergency support personnel. The Battery Park City Cert team has forged a strong partnership with residential buildings and businesses in Battery Park City and has expanded their area of coverage to solicit volunteer members, and offer emergency response services in and around the 130 Liberty Street vicinity.

3.6 The Public

On-site contractors will be located at the 130 Liberty Street building on a 24-hour basis, conducting deconstruction activities or providing security during nonworking hours. Because of the project site's proximity to residential and business areas in Lower Manhattan, the community living and working adjacent to 130 Liberty Street will be continuous observers of project activities. As a result, they will become familiar with day-to-day activities and the contractors conducting these activities. LMDC encourages neighborhood residents and employees to report unfamiliar activities or suspicious persons. If an emergency event is observed, please call 911 or the LMDC 24-Hour Emergency Hotline at 646-942-0694.

In light of the many steps taken in New York City to encourage public awareness and preparedness, and the initiatives supported by OEM, LMDC encourages all residents in Lower Manhattan, including neighborhood residents and businesses to take a moment and confirm that they are prepared. This involves looking at what they have done or need to do to prepare themselves, their family or colleagues, and their place of residence and/or work in the event of any kind of emergency that may occur. There are no specific or different steps to be taken to prepare for 130 Liberty Street deconstruction activities – the City recommends an all-hazards approach to evaluating personal preparedness. Steps may include:

- Becoming familiar with their building evacuation plans;
- Visiting New York City's OEM's website at www.nyc.gov/html/oem/html/readynewyork/home.html for Ready New York Materials;
- Knowing area emergency phone numbers;
- Preparing Go Bags; and
- Preparing emergency supplies.

Section 4Notification Mechanisms

During emergency events in which First Responders assume full control, all communication notifications will be coordinated through the Incident Command to ensure that accurate information is being released.

In situations where LMDC has retained full control of the emergency incident, LMDC will notify and disseminate all available information to the surrounding community. Community notifications will be accomplished through several means, as described below.

Sign up to receive 130 Liberty Street E-Updates and Incident Alerts at:

http://www.renewnyc.com/Newsletter/

4.1 Mass Notification

LMDC is currently investigating the use of a mass notification system. A mass notification system will allow LMDC to send an emergency message to community members simultaneously through phone, pager, and email within minutes of placing the initial call or message. This system enables the surrounding community to immediately receive pertinent information regarding an emergency, thereby reducing the risk for miscommunication and/or speculation. Mass notification will likely be provided to community residents, tenant associations, businesses, area building management, schools, community facilities, elected officials, and non-first responder regulatory officials.

Once a mass notification system has been identified and brought online, LMDC will work with neighboring residents, businesses, and other community groups to obtain up-to-date contact information.

4.2 130 Liberty Street E-Updates

In the summer of 2004, LMDC developed an electronic database of email addresses in order to disseminate information regarding the 130 Liberty Street deconstruction project, including meeting notices and project updates. LMDC will continue to use this list serve (130 Liberty Street E-Updates) to provide project-status updates to all subscribers. To sign up for the E-Updates, please visit LMDC's website at: http://www.renewnyc.com/130Liberty

4.3 130 Liberty Street Incident Alerts

Similar to E-Updates, Incident Alerts will be disseminated electronically via email. The Incident Alerts will notify users of an emergency and provide the status and measures taken to mitigate the emergency event. Incident Alerts notifications are more serious than the E-Updates and will state so in the Subject Header line. Recipients of the Incident Alerts will include those who subscribe to the E-Update list serve. To sign up for the E-Updates and Incident Alerts please visit LMDC's website at http://www.renewnyc.com/130Liberty

In the event of an emergency, LMDC will notify you by:

- ✓ ***Mass notification via telephone, pager, or email;***
- ✓ ***Incident Alerts via email;***
- ✓ ***130 Liberty Street E-Updates;***
- ✓ ***Pre-recorded messages on the 130 Liberty Street Information Hotline;***
- ✓ ***Media news releases;***
- ✓ ***Community Flyers; and***
- ✓ ***Community Briefings.***

4.4 130 Liberty Street Information Hotline

The LMDC is currently exploring the creation of a dedicated toll-free hotline, available 24 hours a day. The hotline will contain pre-recorded messages for area residents, building owners, businesses, and visitors to obtain information on all activities, project- or emergency-related, occurring at the 130 Liberty Street building. The hotline will contain a pre-recorded message that provides the status of activities currently occurring. Follow-up messages will be recorded as on-site activities change or, in the case of an emergency event, once the situation has been mitigated and incident response complete. No live voice will be available to answer questions on this hotline number.

4.5 Media Notification

During an emergency, LMDC will provide regular emergency incident updates to newspapers and local radio stations and television stations until the incident has been safely mitigated. Contact information for the LMDC will also be provided in all media releases.

4.6 Community Flyers

The LMDC will provide notices, flyers, and/or posters to area residential and commercial buildings after an incident occurs. During non-emergency events, community flyers will provide project information on the 130 Liberty Street project and LMDC contact information. During emergency incidents, flyers will provide incident updates as well as LMDC contact information.

4.7 Community Briefings

Once the emergency event has come under safe control or has been mitigated, the LMDC will hold informal community briefings to provide a status of the incident, an overview of response activities, and any additional steps by LMDC to further mitigate the situation or similar future situations.

Section 5 Notification Protocols

5.1 On-site Incident With No Impact to Surrounding Area

On-site emergency incidents with no impact on the surrounding area include worker injuries and/or rescue, on-site power failure, or contained fires.

LMDC Notification Actions:

- Immediately issue E-Updates to the subscribers of the 130 Liberty list serve. The purpose of the E-Update is to notify area residents that an on-site incident has occurred and to reassure residents that no impact on the surrounding area has occurred.

- Update recording on toll-free hotline to provide the status of the incident.

If an emergency event is observed at the 130 Liberty Street building, please call:
911

LMDC 24-Hour Emergency Hotline 646-942-0694

5.2 City Emergency

City emergencies are city-wide incidents. These include power outages, water main breaks, and weather-related emergencies. If the city emergency were associated with the project site, the Contractor Emergency Coordinator would call First Responder agencies, if necessary, and immediately notify the designated LMDC representative of the incident.

LMDC Notification Actions:

- Immediately issue E-Updates to the subscribers of the 130 Liberty list serve. The purpose of the E-Update is to notify area residents that a city emergency has occurred and to inform residents of the status of the building at 130 Liberty Street.
- Update recording on toll-free hotline to provide the status of the incident.

For information on the 130 Liberty Street project during Non-Emergency periods, please call:

- ***311***
- ***Kate Millea, LMDC Community Liaison: 212-962-2300***

5.3 Neighborhood Impact Emergency

Neighborhood impact emergencies are those incidents that could put the community at risk. Such incidents could, for example consist of structural failure, or fire. Emergency response personnel would be visible on-site.

LMDC will rely on the New York City emergency response agencies for First Responder activities. Emergency response agencies will arrive at the scene, assess the situation, and implement the required operating procedures to safely mitigate the emergency. All community notification will be coordinated through the Incident Command emergency management system.

LMDC Actions:

- Support First Response agencies and coordinate all communications through Incident Command.
- Activate mass notification system. LMDC will activate the mass notification system for all subscribers, including area residents, businesses, schools, community organizations, and regulatory and elected officials close to the project site to notify them of the incident and initial first response activities implemented by First Responders.
- Immediately issue an Incident Alert to the subscribers of the 130 Liberty Street list serve.
- Update the recording on the toll-free information hotline to provide the status of the incident.
- Issue E-Updates with necessary follow-up information about the incident.
- Develop media releases. LMDC will develop media releases for newspapers, radio, and/or television stations.
- Post flyers throughout the community describing the incident and the measures employed in response to the incident.
- Convene a community briefing, open to members of the public, to discuss the incident, what was done in response to the event, and answer any questions that the community may have, if necessary.

5.4 Air Monitoring Exceedance

If air monitoring trigger levels are exceeded during project activities, LMDC will notify U.S. Environmental Protection Agency Region 2, New York City Department of Environmental Protection, New York State Department of Environmental Conservation, and New York State

Department of Labor. Emergency response personnel would not be required on-site. Monitoring and response actions will be consistent with those outlined Section 2 Ambient Air Monitoring Program in the revised Phase I Deconstruction Plan.

For general Lower Manhattan construction information, please visit:

www.lowermanhattan.info

LMDC Notification Actions:

- Immediately issue an Incident Alert to the subscribers of the 130 Liberty Street list serve.
- Update the recording on the toll-free information hotline to provide the status of air exceedances.
- Follow up with an E-Update to provide the status on air monitoring levels.
- Continue to Publish Air Monitoring Data on www.renewnyc.com/130Liberty
- Convene a community briefing, open to members of the public, to discuss the air monitoring levels, what was done in response to the exceedances, and answer any questions that the community may have, if necessary.

Section 6 Emergency Contact Information

If you are a witness to an emergency involving the 130 Liberty Street Building, please call:

- 911; or
- The LMDC 24 Hour Emergency Hotline at 646-942-0694.

Section 7 Non-Emergency Contact Information

For general information on the project at 130 Liberty Street or any other construction project in Lower Manhattan, please call 311.

For general 130 Liberty Street Building inquiries Monday - Friday, 9 am to 5 pm, please call or email:

Kate Millea, 130 Liberty Community Liaison
Telephone: 212-962-2300
Email: kmillea@renewnyc.com

ASBESTOS AND CONTAMINANTS OF POTENTIAL CONCERN ABATEMENT AND REMOVAL PLAN PREPARATION PHASE AND PHASES I AND II

130 LIBERTY STREET NEW YORK, NEW YORK

Prepared for:

Lower Manhattan Development Corporation
1 Liberty Plaza
New York, New York 10006

June 13, 2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY

The Lower Manhattan Development Corporation ("LMDC") plans to clean and deconstruct the building located at 130 Liberty Street in the City of New York (the "Building") pursuant to this Deconstruction Plan. LMDC is submitting this Deconstruction Plan to all relevant federal, state, and local regulatory agencies for review to ensure compliance with applicable laws, rules, and regulations. Cleaning, abatement and deconstruction will not commence until the Deconstruction Plan has been approved by such agencies and the required permits and approvals are obtained.

Various studies of contamination in and on the Building previously were performed by LMDC and others. These studies typically analyzed for asbestos and other contaminants of potential concern ("COPCs") designated by the United States Environmental Protection Agency ("EPA") as being associated with World Trade Center ("WTC") dust.

This Abatement and Removal Plan appropriately addresses the asbestos and COPCs identified in prior studies on both the interior and exterior of the Building. By removing and disposing of all contaminants in a safe and controlled manner, the Plan (i) prevents exposure of workers and the public to asbestos fibers and other COPCs, (ii) safeguards workers and the public from construction debris, and (iii) maintains a safe working and neighborhood environment throughout the cleaning and deconstruction process. In furtherance of these goals, as required by applicable law, all interior cleaning and removal will be conducted under containment and negative pressure which will be maintained in each work area until independent, third party air clearance sampling demonstrates that elevated levels of asbestos and other COPCs do not exist. Additionally, all porous deconstruction waste generated prior to successful air clearance sampling will be handled, packaged, transported, and disposed of, at a minimum, as asbestos waste in properly permitted facilities.

The measures set forth herein ensure that workers and the general public are protected from exposure to asbestos and other COPCs. At the same time, they provide for an effective and efficient process to remove this grim reminder of the attacks of September 11th and permit the re-development of Lower Manhattan.

PART 1 - GENERAL

This Asbestos and COPCs Abatement and Removal Plan for the Preparation Phase and Phases I and II is a component of the overall Deconstruction Plan for 130 Liberty Street, which is being submitted to appropriate regulatory authorities for review and approval to ensure compliance with applicable laws, rules, and regulations.

1.01 BACKGROUND

On September 11, 2001, the Building was severely damaged when debris from the WTC broke approximately 1,500 windows and cut a fifteen story gash in the north façade of the Building ("Gash Area"). In addition, a combination of soot, dust, dirt, debris, and contaminants settled in and on the Building. Since September 11, 2001, the Building has been unoccupied. The Gash Area and broken windows exposed the interior of the Building to the elements, which may have caused some further impacts after the initial exposures and events of September 11, 2001.

Subsequent to September 11, 2001, operations were undertaken by the then-owner Deutsche Bank to clear debris from the plaza, lobby, and interior spaces in the Gash Area. A porous geosynthetic mesh or "netting" was hung on the outside of the Building for further protection and safety. The immediate Gash Area was cleaned in accordance with New York City Department of Environmental Protection ("NYCDEP") and New York City Department of Health ("NYCDOH") protocols to permit the construction of columns, beams, and floor decks to stabilize the Gash Area. Once the initial cleaning and stabilization measures were in place, office furniture, equipment, and other non-attached items in the Building were removed and disposed of by Deutsche Bank.

LMDC, the current owner of the Building, plans to clean and deconstruct the Building as part of the redevelopment and rebuilding of the larger WTC Site. Currently, plans for the 130 Liberty Street site include underground truck security and bus parking away from the locations of the former WTC Towers 1 and 2 and a proposed fifth office tower which will reduce the building density on the WTC Site and create approximately 30,000 square feet of open space for public use.

This plan addresses the abatement, cleaning, and removal of contaminants identified in the Building in the September 14, 2004 Initial Building Characterization Study Report[1] and the Supplemental Characterizations[2] published in February 2005 (collectively, "LMDC Studies"). These LMDC Studies analyzed for five COPCs designated by the United States Environmental Protection Agency ("EPA") as being associated with WTC dust (asbestos, dioxins, lead, polycyclic aromatic hydrocarbons ("PAHs"), and crystalline silica), as well as other contaminants suspected of being present in the Building, including polychlorinated biphenyls ("PCBs") and heavy metals (barium, beryllium, cadmium, chromium, copper, manganese, mercury, nickel, and zinc).

[1] 130 Liberty Street Initial Building Characterization Study Report, The Louis Berger Group, Inc., September 14, 2004.

[2] 130 Liberty Street Supplemental Characterizations, TRC Solutions Inc., issued in February of 2005 as multiple reports.

This Abatement and Removal Plan is being submitted to the federal, state, and city regulatory agencies due to the presence of asbestos and other COPCs in the Building. This Abatement and Removal Plan arises from the commitment by LMDC, its consultants, and its contractors to comply in all respects with federal, state, and local laws applicable to the deconstruction of 130 Liberty Street. By doing so, LMDC, its consultants and its contractors will prevent potential exposure of workers and the public to asbestos fibers and other COPCs in the Building, safeguard workers and the public from construction debris and materials, and maintain a safe working and neighborhood environment. Accordingly, LMDC, its consultants and its contractors propose to (i) conduct the abatement work in a protective and expeditious manner in full compliance with applicable law, thereby protecting workers and the public; (ii) to the extent feasible, bulk load waste materials to minimize truckloads, traffic congestion, and air pollution and noise concerns associated with vehicles servicing the site; and (iii) address letters from the regulatory agencies concerning the previously submitted draft Phase I Deconstruction Plan.

This Abatement and Removal Plan was developed and is intended to meet the spirit and intent of the law, by protecting workers and the general public from exposure to asbestos fibers and other COPCs, both inside and outside the Building, in the vicinity of 130 Liberty, and during shipment and ultimate disposal of the deconstruction debris and wastes. This Abatement and Removal Plan, at the same time, addresses unprecedented operational opportunities and challenges arising from unique conditions caused by the events of September 11th and the logistical realities of cleaning and deconstructing a high-rise building in an active urban setting.

1.02 PHASING OF WORK

The proposed cleanup and abatement will be conducted so that the Building can be safely deconstructed to allow for redevelopment of the WTC Site. This project entails: (i) the general area cleanup (from the interior and exterior of the Building) of WTC dust and debris, which as stated by the regulators must be treated as asbestos, (ii) removal and disposal of installed porous and certain non-porous building materials and components contaminated by WTC dust and debris, which as stated by the regulators must be treated as asbestos (iii) cleaning and salvage of certain installed non-porous building equipment and components contaminated by WTC dust and debris, and (iv) removal of building materials containing asbestos which were present in the Building prior to September 11, 2001 (referred to herein as "ACBM"), from the Building's interior and exterior. During the cleanup and abatement, a minimum buffer zone of two floors, as previously required by NYSDOL, will be maintained between the active abatement (Phase I) area and the exterior abatement/ structural demolition (Phase II) portion of the project.[3] This Abatement and Removal Plan addresses the Preparation Phase and Phases I and II of the deconstruction.

It is the goal of LMDC, its consultants, and its present and future contractors to conduct the proposed cleanup and abatement in a manner which (i) will not expose the general public to asbestos and other COPCs, (ii) will minimize worker exposure to asbestos and other COPCs through the use of appropriate controls and personal protective equipment, (iii) will minimize

[3] NYSDOL letter to EPA dated January 7, 2005, page 4, 1st bullet.

adverse impacts of the project on the adjacent community, and (iv) will address the practical operational opportunities and challenges presented by the Building and the Building conditions.

NYSDOL and other regulatory agencies have stated that the interior of the entire structure is contaminated with asbestos and COPCs.

The Preparation Phase includes the erection of scaffolding and sidewalk sheds, the removal of existing netting and the washdown of the exterior of the building. The initial phase of deconstruction (Phase I) includes the necessary interior, non-structural deconstruction and related work. Phase I will include: cleaning of settled dust and debris (above and below the plenum, within HVAC and other Building systems, and in interstitial spaces), removal of ACBMs, removal of interior building components, and removal of interior non-structural building elements (such as gypsum wall board ("GWB"), small scale mechanical, electrical and plumbing ("MEP") and sprayed-on fireproofing ("SOFP")). The entire interior of the Building**,** with the exception of certain shafts and non-porous mechanical equipment and shafts, will be removed under Phase I.

The sequence of work during Phase I will include the following: work area preparation including the installation of High Efficiency Particulate Air ("HEPA") ventilation equipment, pre-cleaning, and installation of isolation barriers; establishment of waste and personnel decontamination systems; establishment of the negative pressure work area; removal of ACBM materials, WTC dust and debris and all interior building equipment, components and materials by licensed personnel; packaging, transport, and disposal of waste materials; on-going air monitoring; detail cleaning of work area; and clearance air testing.

The Phase I abatement shall be conducted starting at the top of the building and working down. It is anticipated that work areas of approximately four (4) floors will be established.

There may be exceptions to the general sequencing of Phase I work. First, it will be necessary for the Abatement Subcontractor or Scaffolding Contractor to clean some limited, designated exterior surfaces and to create several limited clean containments or sealed penetrations to facilitate the erection of the required man-hoists, crane and scaffolding. This work will occur as necessary and not necessarily in the "top down" sequence presented above. Second, the Abatement Subcontractor may need to clean areas of the basements out of sequence to facilitate some Phase II work. Third, the Abatement Subcontractor must clean access areas required for Phase II activities including emergency egresses. The requirements for this work are further detailed within this Abatement Plan.

Except as required for the erection of the required man-hoists, crane and scaffolding, Phase II activities will not commence until all Phase I activities are complete on the top three floors. After this occurs, previously cleaned and cleared floors may be deconstructed under Phase II provided abatement activities are always at least two floors below the level of deconstruction. Personnel involved with Phase II activities will access their work areas utilizing a "clean" exterior hoist or any other pre-cleaned/ cleared access route and shall only be permitted to work in previously cleaned and cleared areas.

All Phase I activities shall be conducted by a NYSDOL/ NYCDEP licensed Asbestos Abatement Subcontractor under controlled conditions and all resultant debris will be treated as asbestos waste, hazardous waste, universal waste and/or regulated waste (as appropriate) and packaged, labeled, handled, transported and disposed of in accordance with all applicable local, state and federal statutes and regulations, including but not limited to NYSDOL Industrial Code Rule ("ICR") 56. Porous demolition debris and porous material within the work area shall be disposed of as asbestos waste, at a minimum. Non-porous salvage items may be decontaminated and released as specified in Industrial Code Rule 56-8.2.

All mold and bacteriological contamination identified during the LMDC Studies will be addressed concurrently with abatement activities. Since all porous building materials as well as any mold and/or bacteriological contaminated materials will be handled, at a minimum, as asbestos waste, no additional special handling requirements are necessary to address mold and bacteriological contamination. All health and safety protocols regarding the handling of these materials are addressed in Section 5 (Health and Safety Plan) of the Deconstruction Plan.

Phase II will then include the removal of exterior ACBM, removal of the previously cleaned curtain wall assembly, roof, non-porous shafts, any remaining large scale MEP components as well as the removal of previously cleaned structural steel and concrete.

1.03 BUILDING DESCRIPTION

In the LMDC Studies, the Building was divided into six (6) zones which are representative of the various areas of the Building. They include:

- Zone 1 - Mechanical Rooms on the 5th, 6th, 40th, and 41st Floors to include the air intakes, fan rooms, and air handling units of the HVAC system.
- Zone 2 - Office Space located at or below the 24th Floor that may have been subjected to dust entering the Building through the Gash, HVAC system (and possibly circulated through the HVAC system), vertical shafts, or broken windows.
- Zone 3 - Office Space located above the 24th Floor that may have been impacted by dust distributed through the HVAC system, vertical shafts, or broken windows.
- Zone 4 - Gash Area that was cleaned by Deutsche Bank subsequent to September 11, 2001 to permit structural work to be performed.
- Zone 5 - Roof Area that may have been impacted by the settling or adhesion of dust to the exterior surfaces.
- Zone 6 - Exterior façade building materials.

The Building is a structural steel framed building with metal deck, concrete slabs, and an aluminum exterior curtain wall system. Interior features include raised access flooring, acoustical ceiling systems, drywall partitions, other finishes, elevators, escalators, HVAC ductwork and other MEP piping and equipment, and drywall and core board shafts. SOFP is found on structural steel including beams, interior vertical columns, ceiling deck, and perimeter column materials. Concrete masonry unit ("CMU") walls are limited to 1) building core stairwells, elevators, MEP shafts (vertical shafts) between Cellar B and the 3rd Floor, 2) some limited walls at the 39th floor and above and 3) minor continuous vertical utility shafts (three).

Unique building features include Walker ducts and raceways (cell systems). The cell systems are essentially two layers (one in a North-South orientation and the other in an East-West orientation) of electrical and telecommunication cable ducts that traverse the floor within the concrete slabs that comprise the floor. The cell system facilitated the routing of electrical and telecommunication cables from the associated closets to terminals within the office. The cell system is accessed via circular access ports located throughout the floor.

Miscellaneous building components include: light bulbs, light ballasts, mercury thermostats, batteries, and refrigerants.

Typical ceiling heights within the building are 1) Office Floors 12'-13', 2) Data Center Floors 13'-15' and 3) Cellar 16'. Exceptions to these typical ceiling heights are Tenant Floor Nos. 1 (21'), 2 (17.7'), 3 (18'), 5 (28') and 40 (17.2').

The Building has been vacant for a period in excess of three years. Therefore, concern exists about the reliability and operability of various Building system components necessary to support the project, specifically elevators.

1.04 ROLES AND RESPONSIBILITIES

The roles and responsibilities for this project are outlined in the Health and Safety Plan. Specific roles for the Abatement Subcontractor and Environmental Consultant in managing work areas, decontamination systems, and waste load out areas will be outlined prior to commencing work.

1.05 AUTHORITY TO STOP WORK

The Regulators, the Owner, the Contractor, and the Environmental Consultant Project Monitor shall have the authority to stop the abatement work based upon violations of applicable law, the HASP, the Abatement and Removal Plan, the Permits, and/or any approved variances. In addition, the occurrence of any or all of the following events will be reported in writing to the Environmental Consultant Project Monitor and will require the Abatement Subcontractor to stop abatement activities and initiate appropriate corrective actions:

A. Excessive airborne fibers outside containment area (0.01 f/cc or above (via PCM) or in excess of background fiber levels, whichever is greater).
B. Exceedances of US EPA Trigger Levels as contained within the Ambient Air Monitoring Program (Section 2 of the Phase I Deconstruction Plan).
C. Break in containment barriers.
D. Loss of negative air pressure (at or below 0.02 inches of water column).
E. Serious injury within the containment area.
F. Fire or other safety emergency.
G. Power failure affecting the abatement process or the maintenance of negative air pressure.

1.06 UTILITIES AND SITE REQUIREMENTS

A. Wastewater: Any excess or free wastewater generated shall be collected by the Abatement Subcontractor during abatement activities and passed through a water filtration system capable of filtering particles down to 5 microns prior to being discharged into the sanitary sewer. Water will be used from a 2-inch water riser that will be installed by the Contractor. All spent filters shall be containerized and undergo waste characterization in accordance with procedures outlined within Section 1 of the Deconstruction Plan.

B. Fire Extinguishers - As per Section 3 of the Emergency Action Plan, Section 4.1.1, portable fire extinguishers will be strategically positioned throughout the Building. If necessary, temporary fire suppression systems may be utilized to supplement any identified building system deficiencies.

C. Job Site Postings - The Abatement Subcontractor shall either post in the Cellar "A" decontamination system area or have available for review all applicable laws, rules, and regulations required to be posted or available for review. These include but are not limited to the following:

1. A copy of the US EPA Regulations for Asbestos, 40 CFR 61 Subparts A and M; a copy of OSHA Asbestos Regulations, 29 CFR 1926.1101; and a copy of NYS ICR 56.

2. A copy of NYCDEP permits and conditions**.**

3. A copy of Worker's NYS DOL and NYCDEP Asbestos Handler Licenses/Certificates for each worker on the site

4. A copy of all applicable US EPA, NYS DOL and NYC DEP Notifications and Approved Variances.

5. A copy of Deconstruction Plan Section 3 - Emergency Action Plan– with the list of emergency contacts and telephone numbers, location of nearest hospital and emergency response agencies (the list of emergency contacts and telephone numbers, location of nearest hospital and emergency response agencies will also be posted at the decontamination unit entrance).

6. A copy of all Material Safety Data Sheets (MSDS) for chemicals used during the asbestos project.

7. A copy of Deconstruction Plan Section 5 – HASP.

8. A copy of waste hauler information, including but not limited to the location of the waste site, permits and licenses.

9. A copy of Abatement Subcontractor's NYS DOL and NYCDEP Asbestos Contractor licenses

10. The Abatement Subcontractor's OSHA personal monitoring results.

11. The Environmental Consultant Project Monitor's daily air sampling results.

1.07 FIRE PROTECTION/ EMERGENCY EGRESS/ SAFETY

The Contractor shall be responsible for the security and safeguarding of all areas. The Abatement Subcontractor shall designate to its workers the means of egress in case of emergency.

A. The Abatement Subcontractor shall establish emergency and fire exits from the work area. This information is found in Section 3 (Emergency Action Plan) of the 130 Liberty Street Deconstruction Plan. First aid kit(s), a minimum of six (6) full sets of protective clothing, and six (6) Powered Air Purifying Respirators (PAPRs) shall be provided for use by qualified emergency personnel in the clean room of the decontamination facility.

B. The Abatement Subcontractor shall provide a fire watch during all work activities to protect against fire. Fire watch shall be a certified asbestos handler by New York State Department of Labor (NYSDOL) and HAZWOPER trained.

C. Fire protection shall be provided via a dry standpipe system to be located centrally on each floor in accordance with all applicable NYC Building Department or FDNY requirements. Both the dry standpipe and the 2" water line will be available for fire protection and fire prevention at all times during the deconstruction operation.

D. All abatement personnel shall utilize stairwells 'A' and 'B' and deconstruction personnel shall use exterior scaffold stair towers for emergency egress during Deconstruction activities. Refer to the Emergency Action Plan found within Section 3 of the Deconstruction Plan for more details.

PART 2 – WORK PLAN

The sequence of work during Phase I includes the following: establishment of waste and personnel decontamination systems; work area preparation including pre-cleaning for the installation of isolation barriers and the installation of HEPA-filtered ventilation equipment; establishment of the negative pressure work area; precleaning; removal of ACBM materials, settled dust and debris and all interior building equipment, components, and materials by licensed personnel; packaging, transport, and disposal of waste materials; on-going air monitoring; detail cleaning of work area; and clearance air testing.

All work shall comply with applicable regulations including NYSDOL Variance Decision File Numbers 04-1432 and 05-0427 (attached) and associated conditions.

2.01 ESTABLISHING PERSONNEL DECONTAMINATION ENCLOSURE SYSTEM

REMOTE PERSONNEL DECONTAMINATION ENCLOSURE SYSTEM

Use of a remote personnel decontamination enclosure system ("decon") will be limited to exterior work, interior negative pressure tent enclosures. The following activities are proposed to be conducted utilizing remote personnel and waste decon units:

- Netting removal;
- Exterior façade cleanup;
- Exterior fireproofing removals;
- Scaffold tie-ins, hoist tie-in installation, and crane tie-ins;
- Preliminary roof cleaning to establish a clean area for construction of a personnel decon on the roof for the balance of roof cleaning and for access/egress to the uppermost Work Area Grouping and roof transite and roof caulking removals; and
- Creating waste decon access openings.

A large project personnel decon, remote from the work area, but otherwise in compliance with the provisions of ICR 56-9, shall be utilized. The large project personnel decontamination enclosure system shall be fully framed and sheathed.

Personnel shall don appropriate personal protective equipment ("PPE") prior to entering the remote decon.

Personnel Entrance and Decontamination Procedures for Removal Operations utilizing Remote Decontamination Enclosure System

The following entry/exit procedures shall be used for remote removal work areas.

1. All individuals who enter the work area shall legibly sign the entry/exit log located in the clean room upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each work area and worker respiratory protection employed. The job supervisor shall be responsible for the maintenance of the log during the abatement activity.

2. Each worker shall remove street clothes in the clean room; wear two disposable suits, including gloves, hoods and non-skid footwear and put on a clean respirator (with new filters) before entering the work area. Respiratory protection requirements are detailed in Section 5 of the Deconstruction Plan ("Health and Safety Plan for the Deconstruction of the 130 Liberty Street Building").

3. Personnel utilizing the remote decon, before leaving the work area shall clean the outside of their respirators and remove outer protective clothing. In the air-lock to the work area, the inner suit shall be cleaned by wet cleaning and/or HEPA-vacuuming. The worker shall don a clean outer suit and then proceed to the

designated internal elevator for transport to the decon. The respirator shall be removed and rinsed in the shower. [m1]

4. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes and exit the decon immediately. Personnel shall sign out of the log book.

ATTACHED PERSONNEL DECONTAMINATION ENCLOSURE SYSTEM

Abatement is proposed to be conducted within a series of consecutive floors ("Work Area Grouping") concurrently. A decontamination unit ("decon") will be installed on the "cleared" floor immediately above the active Work Area Grouping and will be attached to the Work Area Grouping. Non-contaminated make-up air will be drawn from (a) cleaned vertical shafts and (b) through the attached decon from building areas, which have been previously cleaned and released, which exist outside the personnel decon and above the active Work Area Grouping. The top floor of the Building will be addressed using a remote decon as previously discussed.

Personnel Entrance and Decontamination Procedures for Removal Operations Utilizing Attached Decontamination Enclosure System

Entrance/egress from the active Work Area Grouping shall be through an attached decon located on the first clean floor above the active Work Area Grouping. The top floor of the Building will be addressed as previously discussed. The following entry/exit procedures shall be used for removal using attached decon:

1. All workers and authorized visitors shall enter the Work Area Grouping through the worker decon.

2. All individuals who enter the Work Area Grouping shall sign the entry log, located in the clean room, upon each entry and exit. The log shall be permanently bound and shall identify fully the facility, agents, contractor(s), the project, each Work Area Grouping and worker respiratory protection employed. The site supervisor shall be responsible for the maintenance of the log during the abatement activity.

   Each worker or authorized visitor shall, upon entering the job site, remove street clothes in the clean room and put on a clean respirator (with new filters, if appropriate) and clean protective clothing before entering the Work Area Grouping through the shower room and equipment room.

4. Each worker or authorized visitor shall, each time he leaves the Work Area Grouping: remove gross contamination from clothing before leaving the Work Area Grouping; proceed to the equipment room and remove all clothing except the respirator; still wearing the respirator, proceed to the shower room; clean the outside of the respirator with soap and water while showering; for half-face respirators remove filters, wet them, and dispose of them in the container provided for that purpose; wash and rinse the inside of the respirator; and thoroughly shampoo and wash himself/herself.

5. Following showering and drying off, each worker or authorized visitor shall proceed directly to the clean room, dress in street clothes, and exit the decon immediately.

Clearance air monitoring may be performed on individual floors within the active Work Area Grouping as follows. The floor(s) to be cleared individually will be isolated from the balance of the Work Area Grouping at the completion of gross removal and gross clean-up within the floor(s) to be cleared. Airlock(s) with a minimum dimension of 3'x 3' will be constructed at (a) the entrance to the clean vertical shaft on the isolated floor(s) and (b) at the entrance to the isolated floor(s) from the balance of the Work Area Grouping. Personnel proceeding to the isolated floor in the final cleaning stage shall don two suits within the personnel decon, and shall then remove their outer suit prior to entering the airlock at the entrance to the isolated work area that is in the final cleaning stage. Upon achieving satisfactory clearance air sampling results, the cleared floor shall be isolated from the balance of the Work Area Group.

2.02 ESTABLISHING WASTE DECONTAMINATION ENCLOSURE SYSTEM

All ACBM and asbestos contaminated waste will be appropriately bagged/containerized within the regulated abatement work area and attached waste decontamination enclosure system ("waste decon"). A waste decon enclosure system may be constructed within the negative pressure work area at the exit from the contained area. The waste re-packaging area shall be fully framed and the interior floor, wall and ceiling surfaces shall be lined with two layers of 6-mil reinforced fire-retardant poly.

The interior and exterior entrance to the waste re-packaging area shall be of sufficient size to accommodate large metal components, to permit safe entry and exit of heavy equipment and shall contain "flaps" or a curtain drape to assist in maintaining negative pressure within the waste re-packaging area.

All removed ACBM must be packaged at the time of removal. No removed ACBM or asbestos waste will remain unpackaged at the end of the work day.

The floor surface in the waste process area shall be banked on the sides to confine contaminated waste water. Waste water shall be drained, collected and filtered through a system with at least 5 micron particle size collection capability. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtration system by large particles. Filtered wastewater shall be discharged in conformance with applicable codes. Contaminated filters shall be disposed of as asbestos waste (at a minimum).

Non-porous materials may be decontaminated utilizing wet methods (a pressure wash system may be used). Removal of non-porous, movable salvage shall be performed in compliance with 56-8.2(a).

Any non-porous, sealed Gaylord type boxes, loaded with asbestos waste, will be placed on pallets and passed through the waste decon via a pallet jack where they will be wet wiped and HEPA vacuumed. Upon completion of the waste decontamination procedures, the interior of the

waste re-packaging area shall be wet cleaned. All standing water shall be removed by HEPA vacuuming or mopping the area.

One or more contaminated interior vertical shafts may be maintained to provide for transport of (a) containerized waste from the active abatement area to the waste re-packaging area and/or (b) properly packaged waste to the waste decon for final packaging prior to transport from site. The contaminated interior shafts will be isolated from any floor within the active Work Area Grouping where gross removal and gross cleaning has been completed. The contaminated interior vertical shaft shall remain isolated from all cleaned areas and non-active abatement areas. A curtained doorway shall be constructed at the lowest point of egress from the interior contaminated vertical shaft. Additional requirements for the use of contaminated interior shafts for the transport of wastes are described below in Subsection 2.11.

2.03 INSTALLATION OF ISOLATION BARRIERS

Isolation barriers conforming to the requirements of ICR 56-8.1(j) shall be constructed following pre-cleaning of isolation barrier surfaces. The Building exterior is constructed of fixed pane windows and sealed spandrel panels. Where intact, the Building exterior construction will form part of the isolation barriers. Missing windows or sections of curtain wall will be sealed using rigid sheathing, caulk and tape in compliance with ICR 56-8.1(k)(1) and ICR 56-8.1(k)(2), adhering to requirements approved by a New York State Licensed Professional Engineer. The interior surface of the rigid sheathing will be covered with two layers of fire retardant polyethylene ("poly") of 6-millimeters ("mil") in thickness and sealed with tape. Exterior louvers associated with mechanical room fresh air intakes will be sealed from the Building interior using two layers of 6-mil poly and tape.

Additional required isolation barriers shall consist of two layers of 6-mil fire retardant poly sealed individually with tape. All openings and penetrations to the exterior of the work area shall be sealed in accordance with ICR 56-8.1(j) and 8.1 (k) Items 1-4. Small penetrations around piping, conduit, etc., may be sealed with expandable foam. Floor drains shall be covered with two layers of 6-mil poly.

2.04 ESTABLISHING A NEGATIVE PRESSURE CONTAINMENT

No demolition or abatement shall occur within a negative pressure work area until area preparations and isolation barrier pre-cleaning activities as previously defined are completed.

Each floor in the work area is approximately 35,000 square feet with an average ceiling height of 13 feet. More than 20 operating HEPA-filtered negative ventilation units will be required to maintain the required air change rates on each floor.

Negative ventilation unit exhausts shall be placed into groups not to exceed five units. One extra group of five HEPA-filtered negative ventilation units shall be installed per work area as a back-up to maintain the minimum required air changes per hour should a primary bank of five (5) units be taken out of service during required shutdowns. If an elevated exhaust air sample is obtained, the bank of 5 units with the elevated result will be shut down, the units and filters

inspected, repaired/changed out as necessary, and then put back into service. Each of those five units will be sampled independently for a minimum of three days to ascertain if any problems still exist. Upon receipt of additional elevated air sample results, the affected unit(s) will be taken out of service and removed from the work area for appropriate repair.

Negative ventilation exhausts will be installed to ensure the minimum distance of fifty (50) feet is maintained from air intake receptors in adjacent buildings. Sufficient HEPA ventilation units shall be installed to maintain at least four (4) air changes per hour during abatement and clean up activities.

HEPA ventilation exhaust will be installed within exterior building openings, where practical. In areas where there are no exterior building openings available, ventilation exhaust will occur at existing window locations. To facilitate those exhausts points, the following procedure will be utilized:

- The window pane will be secured from the interior and cut along the interior framing.
- The window will be angled and brought into the work area and either cleaned of settled dust or disposed of as an asbestos waste.
- The interior frame area will be cleaned using wet methods. A rigid barrier with cutouts to accommodate up to five negative air exhaust flex hoses will be inserted into the opening of the interior frame area and all seams shall be sealed using caulk or foam. Flex hose penetrations shall be sealed airtight using caulk, foam or 6-mil poly and tape, as needed.

ACBM window pane caulk was not identified during conduct of the ICR 56-1.9/EPA NESHAPS Pre-demolition asbestos survey conducted at the site. Removal of window panes will not impact ACBM aluminum panel caulking. It is therefore anticipated that disturbance of ACBM caulk will be avoided or minimized, to the extent practical, prior to installation of negative ventilation units. Window removal and manifold installation will occur prior to any other preparation or potential asbestos disturbance, including debris removal within work areas. Pre-cleaning of window removal locations will occur prior to manifold installation activities. Visible gross debris, existing on interior that will be impacted by installation of negative ventilation units/manifolds will be wetted and placed directly into a disposal container. All impacted interior window surfaces will be HEPA vacuumed and/or wet-wiped prior to disturbance. Work area preparation and cleanup of gross debris will commence upon completing installation of negative ventilation equipment. No dry removal or disturbance of asbestos shall be permitted.

Exhaust duct hose will be installed and maintained in the work area to avoid damage to the extent possible and shall be inspected on a daily basis to ensure no damage has occurred. Any damage noted shall require the immediate shut down of that negative air machine to allow for repair or, if repair is not possible, the length of exhaust duct shall be replaced prior to placing the unit back into service.

Air outlets from the work area shall be at or near floor level. Power tools used to drill, cut into or otherwise disturb asbestos material, including settled dust or materials impacted by settled dust, shall be equipped with HEPA filtered local exhaust ventilation.

Non-Contaminated Make-Up Air Source For All Work Areas

Non-contaminated make-up air will be drawn from cleaned vertical shafts, areas which have been previously cleaned and released which exist above the active work area, and/or through the waste decon with direct access to the exterior of the building. Airlock(s) with a minimum dimension of 3'x 3' will be constructed at the isolation barrier to the cleaned vertical shafts within the active abatement area. Supplementary non-contaminated make-up air, if required, will be provided using temporary "duct runs" or HEPA filtered make-up air vestibules from either cleaned areas or exterior sources.

2.05 PRE-CLEANING

Pre-cleaning shall consist of cleaning of surfaces over which isolation barriers will be installed. Loose material on exposed surfaces over which isolation barriers and negative pressure ventilation exhaust duct manifolds will be installed shall be wetted thoroughly with amended water prior to disturbance and/or HEPA vacuumed. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, shall be prohibited.

Large pieces of debris (e.g., building components, building materials) on the floor that may inhibit the installation of isolation barriers, the negative pressure system equipment or the movement of personnel on a floor will be removed and either containerized for proper disposal or, if non-porous material, may be staged for cleaning and salvage during subsequent Phase I abatement activities.

HEPA vacuuming or wet wiping of surfaces throughout the enclosed work area to clean dust, to remove debris that inhibited installation of isolation barriers and ventilation equipment as described above, and the removal of installed building components/materials will be performed within a HEPA-filtered negative pressure enclosure during subsequent Phase I abatement activities.

2.06 ESTABLISHING WORK AREAS

Each floor may be segregated into one or more negative pressure work areas. Abatement is proposed to be conducted within a series of consecutive floors ("Work Area Grouping") concurrently. Work areas within or between floors may be segregated by constructing an isolation barrier consisting of two layers of at least 6-mil poly within existing structural openings (e.g., doorways, corridors).

Prior to the start of abatement activities, the contained work area shall be inspected to ensure that it is free of any penetrations to outside the work area and is a closed system. Should any penetrations be found, they shall be properly sealed. Smoke testing of barriers and enclosure systems will be performed in conformance with ICR 56-11.1(e).

If during the removal operations a penetration is found, work in that work area shall stop immediately and the penetration shall be properly sealed.

2.07 ESTABLISHING AND RELEASING A CLEANED AREA WITHIN THE CONTAMINATED BUILDING AREAS UTILIZING INTERIOR NEGATIVE PRESSURE TENT ENCLOSURES

Interior Negative Pressure Tent Enclosures will be utilized to clean and release contaminated areas within the Building that cannot otherwise be included in the Interior Negative Pressurized Containment on a floor due to sequencing requirements. Procedures for establishing, cleaning, clearing and maintaining Negative Pressure Tent Enclosures are described below.

1. As the Negative Pressure Tent Enclosure will be installed within a contaminated area of the building, a Remote Personnel Decontamination Enclosure System, otherwise consistent with the requirements of ICR 56-9, shall be utilized.
2. If at any time a worker has to pass through an uncontaminated area to access the remote decon unit or the next work area, the worker wearing two suits of PPE shall remove one suit while in the airlock, wet wipe and HEPA vacuum exterior surfaces of the respirator and the inner suit, don a clean outer suit and proceed either to the next work area or the decon unit.
3. Negative Pressure Tent Enclosures shall be constructed and used per the 05-0427 Variance Decision dated May 11, 2005 including but not limited to two layers of six mil fire-retardant polysheeting and shall include walls, ceiling and a floor (except for portions of floors, walls and ceilings that are removal surfaces) with double-folded seams. Interior tent areas will be constructed with an attached 3'x 3' airlock. Make-up air shall be provided to the airlock through HEPA-filtered interior air sources.
4. Personnel exiting the Negative Pressure Tent Enclosure shall proceed through the contaminated portion of the building to the remote personnel decon.
5. Once tent enclosure work area preparation has been completed and abatement activities commence, on a daily basis and per work-shift, one air sample shall be collected within the tent enclosure entrance/exit. No other air samples associated with this work will be collected during the work exterior to the tent in the contaminated portions of the Building.
6. Clearance air sampling inside the tent, per 05-0427 Variance Decision, will be conducted under static pressure conditions. No other clearance air samples associated with this work will be collected during the work exterior to the tent in the contaminated portions of the Building. Upon completion of clearance air sampling, the tent shall be sealed airtight.
7. Upon receipt of successful clearance air sampling results, the tent enclosure will be maintained under a slight positive pressure utilizing HEPA-filtered supplied air to maintain its clean condition. Personnel entering the interior tent enclosures from a contaminated area shall proceed as follows:
   - Upon entering the attached airlock, personnel shall remove the outer layer of protective clothing.
   - The exterior surface of the respirator shall be wet-wiped or HEPA vacuumed.
8. The opening to the exterior (if required) can then be established within the tent.
9. Once work is complete in the tent, isolation of the opening to the exterior shall be maintained by installation of isolation barriers or decon chamber.

Hoist/Scaffold Tie-Ins

Tie-ins for the erection of any scaffold and hoist shall be performed by New York City Department of Environmental Protection ("NYCDEP") and New York State Department of Labor ("NYSDOL") asbestos certified handlers in a controlled manner as described below:

Tie-ins requiring Glass Panel Removal

For tie-ins requiring the removal of sections of the curtain wall glass, the following procedures shall be required:

1. Existing exterior netting shall be removed following the procedures described herein.
2. The exterior of the glass to be removed to facilitate installation of tie-ins shall be cleaned per NYCDEP protocols as defined in the NYSDOL Variance Decision File No. 05-0427.
3. Prior to removal of glass, the interior tie-in attachment points shall be enclosed within an Interior Negative Pressure Tent Enclosure attached to the glass to be removed as described above. The Negative Pressure Tent Enclosure shall be large enough to accommodate workers, equipment, glass and material removal and cleaning operations. All items within the tent shall be properly removed and surfaces cleaned. Each Negative Pressure Tent Enclosure shall be cleaned and cleared, including passing a visual inspection and clearance air sampling prior to creating the opening to the exterior.
4. Once the necessary tie-in connections are prepared, the opening to the exterior can be established and final connections made for the erection of the hoist or scaffold.
5. The Abatement Subcontractor shall then immediately seal the exterior opening with a rigid barrier covered by two layers of six-mil polyethylene sheeting with appropriate supports to ensure the barrier will remain in place until the completion of Phase I Deconstruction activities on the floor.

Tie-ins requiring Aluminum Panel Removal

For tie-ins requiring the removal of sections of the curtain wall aluminum panels, the following procedures shall be required:

1. Existing exterior netting shall be removed following the procedures described herein.
2. The exterior of the aluminum panels to be removed to facilitate installation of tie-ins shall be cleaned per NYCDEP protocols as defined in the NYSDOL Variance Decision File No. 05-0427.
3. Prior to removal of aluminum panels, the interior tie-in attachment points shall be enclosed within an Interior Negative Pressure Tent Enclosure attached to the aluminum panels to be removed as described above. In addition, a Negative Pressure Tent Enclosure shall be constructed on a scaffold exterior to the building to enclose the aluminum panels to be removed. (Note a pilot study is to be proposed to attempt to establish possible procedures in lieu of exterior enclosures for this work.) The Negative Pressure Tent Enclosure shall be large enough to accommodate workers, equipment, aluminum panels and material removal and cleaning operations. All items within the tent shall be properly removed and surfaces cleaned. Each Negative Pressure Tent Enclosure shall be cleaned and cleared, including passing a visual inspection and clearance air sampling prior to creating the opening to the exterior. Each exterior exterior tent enclosure shall be constructed and negative air established prior to commencement of necessary removals. Once removals are complete, cleaning of surfaces followed by a

satisfactory visual inspection by the project monitor shall be completed prior to commencement of clearance air sampling.

4. Once the necessary tie-in connections are prepared, the opening to the exterior can be established and final connections made for the erection of the hoist or scaffold.
5. Prior to removal of tent enclosures, the Abatement Subcontractor shall then immediately seal the exterior opening with a rigid barrier covered by two layers of six-mil polyethylene sheeting with appropriate supports to ensure the barrier will remain in place until the completion of Phase I Deconstruction activities on the floor.

Tie-ins Requiring Small Penetrations through Curtain Wall

For tie-ins requiring small (less than six inch diameter) penetrations of the curtain wall utilizing manufacturer equipped HEPA-shrouded drilling/cutting equipment, the following procedures shall be required:

1. Access to the active work area on the scaffold will be restricted. The work area on the scaffold shall be cordoned off with barrier tape.
2. Only NYSDOL and NYCDEP certified asbestos workers shall be permitted within the work area.
3. The exterior of the impacted section of curtain wall to facilitate installation of tie-ins shall be cleaned per NYCDEP protocols as defined in the NYSDOL Variance Decision File No. 05-0427.
4. Drilling or cutting through asbestos-containing caulk on sections of aluminum column covers and fascia is not permitted unless work is performed within an exterior Negative Pressure Tent Enclosure. (Note a pilot study is to be proposed to attempt to obtain regulatory relief from the requirement for exterior enclosures for this work.)
5. Drilling or cutting through the curtain wall to create a small penetration for installation of tie-ins shall be accomplished with manufacturer-equipped HEPA filtered and shrouded drilling/cutting equipment utilizing wet methods.
6. Polyethylene sheet or rubber mat shall be installed under the work area prior to the start of work. Upon completion of creating a small access point in curtain wall, a connecting rod shall be inserted within the penetration, the penetration sealed and the area HEPA vacuumed and/or wet-wiped.
7. Interior installation of the tie-ins shall occur within the Building by properly certified NYSDOL and NYCDEP asbestos workers.

2.08 MOVEMENT OF PERSONNEL

With the exception of the first grouping of work areas on the upper floors and where remote decons are allowed, as previously described, abatement personnel will enter the active abatement areas from the attached personnel decon established on the cleaned floor(s) above. Transport of workers will be through the use of an exterior hoist or cleaned vertical shaft. Abatement personnel will enter the personnel decon and shall don PPE prior to entering work area.

Access between floors within the active abatement area will be primarily through interior stairwells which have not been cleaned. Work area egress shall be as described below in the section entitled, “Sequencing of asbestos project work within shafts and stairwells”.

With the exception of Specialty Trade personnel involved in abatement project support activities, non-certified worker access to non-asbestos project areas above the floors still subject to abatement and cleaning will be primarily by use of an exterior hoist(s) or stair tower(s) through established exterior access openings. Construction of tunnels within cleaned stairwell(s) may also be utilized for interior access.

Sequencing of Asbestos Project Work Within Shafts And Stairwells (Interior Vertical Shafts)

The current Phase I approach provides for conducting a wall to wall gut on each floor within the active work area. CMU walls are limited to 1) building core stairwells, elevators, MEP shafts (vertical shafts) between Cellar B and the 3rd Floor, 2) some limited walls at the 39th floor and above and 3) minor continuous vertical utility shafts (three).

The balance of vertical shaft walls are constructed with a 1" gypsum core board on the interior side and two layers of 5/8" sheetrock on the exterior (tenant) side. One or more interior vertical shafts will be maintained for use by abatement personnel during the project as described below.

Clean Interior Shafts

One or more interior vertical shafts may be maintained to provide "clean" make up air for clearance air monitoring of individual floors and movement of clean personnel and equipment during the project. The vertical shaft to be cleaned will be isolated from adjacent contaminated spaces. The interior surfaces and equipment of the "clean" vertical shaft shall be thoroughly HEPA vacuumed and wet-wiped prior to conducting aggressive TEM clearance air sampling. Clean make-up air will be provided from non-contaminated areas above or below the vertical shaft, as practicable.

Upon successful completion of clearance air sampling, the cleaned vertical shafts will be isolated from contaminated areas prior to and during active abatement and gross cleaning on each floor. At the completion of removal and gross clean-up, an airlock(s) with a minimum dimension of 3'x3' will be constructed at the work area(s) entrance to the clean vertical shaft. Make-up air during the final clean-up stage and for clearance air monitoring for each isolated work area will be provided from the clean vertical shaft. Access/egress for abatement personnel through clean vertical shafts shall be limited to those areas where satisfactory clearance air monitoring results have been achieved.

Only properly packaged and labeled waste or personnel moving between clean areas shall be transported within clean vertical shafts. Use of cleaned vertical shafts by abatement personnel shall be limited to access between clean areas only. Bulk waste material containers shall not be transported through these cleaned vertical shafts.

Waste Movement via Contaminated Interior Shafts is described in Subsection 2.11 Movement of Material and Waste.

Disassembly of Clean and Contaminated Interior Vertical Shafts is described in 2.10 Work Procedures.

2.09 SEQUENCE OF WORK

Negative air systems and isolation barriers will be completed prior to bulk debris removal. All interior non-structural building materials will be removed under negative pressure during Phase I abatement activities. The project involves concurrent decontamination of non-porous Building and equipment surfaces, disposal of building materials contaminated with settled dust and debris, and removal of ACBM from within the same negative pressure work area. Installed ACBM, located above or behind contaminated building materials, will be exposed during interior demolition to permit removal of this material inside of the existing negative pressure work area. All remaining non-porous interior surfaces/equipment shall be cleaned as part of the post-abatement cleaning process prior to clearance air sampling.

Building materials will be removed using the following general sequencing within each designated work area, as applicable. Removal of multiple types of ACM[4] within a single containment shall follow the sequential order from the ceiling down and or from the most friable to least friable in each active abatement area per the Variance Decision File No. 05-0427. Multiple active abatement areas may exist simultaneously within a single containment, however individual active abatement areas shall be separated by a minimum distance of fifty (50) feet (approximately equal to distance between two (2) columns).

Transite panels serving as louver blanks will be removed manually as part of the isolation barrier installation process. Localized negative exhaust will be used during the removal process.

Transite panels will be removed intact, to the extent feasible. As transite panels are removed, louvers will be HEPA vacuumed and/or wet-wiped and isolation barriers installed. At no time will greater than 64 square feet be open at any one time prior to installation of isolation barriers.

2.10 WORK PROCEDURES

1. Materials containing asbestos or contaminated by dust shall be wetted frequently with amended water. No dry removal or disturbance of asbestos shall be permitted.

2. Sufficient time shall be allowed for penetration to occur prior to abatement activities. All friable asbestos shall be saturated. All non-hygroscopic asbestos shall be maintained thoroughly wetted.

[4] When used herein, "ACM" means asbestos (friable or non-friable), asbestos material (friable or non-friable), asbestos-containing material (friable or non-friable), and/or asbestos waste (friable or non-friable), including but not limited to (i) building materials containing asbestos which were present in the Building prior to September 11, 2001, and (ii) any and all materials impacted by asbestos (solely excluding non-porous items impacted by asbestos if and only if said non-porous items have previously been properly cleaned and released in accordance with all Legal Requirements to the satisfaction of all of the applicable federal, state, and local Governmental Authorities). The Government Authorities have stated that (a) WTC dust and debris and (b) all materials impacted by WTC dust and debris must be treated as asbestos material and disposed of as asbestos waste and, accordingly, all of these materials are included in the definition of ACM herein.

3. The lowest elevation within each active work area shall be rendered water tight. Clean-up of waste water shall be on-going during pressure washing. Absorbent materials and/or plasticizing will be utilized within the containment, as required, to control water during cleaning activities. Waste water will be contained within the active work area during pressure washing activities. A pressure washer may be used to assist in detail work area cleaning.

4. Asbestos materials and asbestos-contaminated materials on detachment from the substrate shall be directly bagged/containerized.

5. Floor tile and mastic will be removed via the following work practices:
   - Floor tiles and mastic shall be periodically misted with amended water prior to, during and subsequent to removal.
   - Floor tiles will be removed using manual methods only, to the extent practical.
   - Floor tiles shall be directly containerized for disposal.
   - Chemical mastic remover using manual methods and or a mechanical buffer may be used to remove gross residual mastic from areas.
   - Concrete staining or discoloration caused by absorption of liquefied petroleum based mastics will be visually inspected to verify that all residual mastic has been removed from the concrete substrate. Upon verification that residual mastic has been removed, concrete staining or discoloration may remain.

6. ACBM pipe insulation shall be removed within an existing negative pressure work area and will be removed either using glovebags or a "wrap & cut" procedure with glovebag removals at cut locations. The abated area of the pipe to be cut need not be plasticized. Pipe sections to be removed with the ACBM insulation intact shall be wrapped with two layers of 6-mil poly and sealed with tape. A label shall be placed on each length of pipe. Pipe shall be adequately supported prior to cutting and shall be cut only on abated or clean surfaces.

7. SOFP shall be removed within an existing negative pressure containment as follows:
   - The floor within the active SOFP removal area shall be covered utilizing a single layer 6-mil poly drop cloth extending beyond the active SOFP removal area by at least ten feet in every direction;
   - If a pressure wash system is used for final cleaning, waste water will be collected, filtered through a system with at least 5.0 micron particle size capability prior to discharge in accordance with all applicable regulations.

8. Walker Duct and raceways will be cleaned, inspected and cleared as follows:

   Cleaning, Visual Inspection and Clearance of Walker Ducts and Raceways

   It is the intent of this work to clean and remove all dirt, dust and debris from the raceway and walker ducts in the floor cabling system. If after video inspection and/or testing, it is determined that areas have not been thoroughly cleaned, those areas shall be re-cleaned by the contractor. Third party inspections will be conducted by the Owner's representative. This work will be done during the Asbestos Abatement Project under negative pressure.

A. Work to be performed will include the following:

- Removal of raceway/duct access plates, as necessary.
- Removal of all wires and cables from the ducts/raceways
- Isolation of ducts, as required, to prevent cross contamination.
- Cleaning of all East to West Raceways (approx 2" x 6") on all floors.
- Cleaning of all Walker Ducts (1" x 4") on all floors.
- Cleaning of all terminal drops to floor ducts which are part of the systems.
- Removal of all dirt, dust, lint, etc., caused by cleaning process in areas affected by cleaning process.
- Representative photographs will be taken after cleaning.

B. Cleaning, Visual Inspection and Clearance Air Sampling will be performed as follows:

- Cleaning will be performed in accordance with the National Air Duct Cleaners Association Standards (NADCA) ACR 2005. All access will be through existing 6" floor openings.
- Negative air machine shall be attached to the duct system to obtain approximately 2,500 linear feet per minute of air movement across the active duct work space.
- All areas will be air washed using Scand Tech USA High Volume Nozzles or equivalent.
- Air washing will be done using high volume, medium pressure Scand Tech USA Tornado Nozzles, or equivalent (see attached for example equipment). Maximum air pressure at nozzles should not exceed 125 psi with a minimum volume of 80 cubic feet per minute (CFM). Air movement must be of sufficient volume to prevent any cross contamination.
- High volume Tornado Nozzles will be used to move contaminants to the collectors. Use of tube style air whips will not be allowed unless they are capable of dispensing a minimum of 80 CFM of discharge air.
- Air Compressors will be Kaeser ASD 30 or equivalent. Air compressors must generate a minimum of 130 CFM at 125 PSI. Air compressors will use "Y Delta" connections to reduce start up amperage.
- HEPA Air Scrubbers up to 2000 CFM will be used for make up air entering the duct systems.
- Dislodged contaminants will be collected in a HEPA filtration system. All dirt, duct, lint and other accumulations will be removed by approved, HEPA filtered negative air machines (NADCA ACR 2002, 5.3.3) capable of removing a minimum of 4000 CFM of air from the duct system during the cleaning process.
- Following initial air washing, a visual inspection of the cleaned duct area will be performed. As the cleaning work progresses and prior to duct access plate closure, the cleaned duct work area shall be inspected.
- Video inspection equipment will be used to inspect cleaned duct areas (see attached example equipment). The camera lens will be capable of focusing to 1" from surfaces. Inspection equipment will be capable of inspecting ducts of a minimum 1" x 4" dimension up to an approximate distance of 20 meters from one access port.

- All inspected areas will be identified and representative photographs taken.
- If debris is still observed during the visual inspection, brushing may be required. If necessary, a variety of brushes and mechanical agitators may be used to dislodge contaminants. If brushing is required, brush cables must be capable of reaching up to 30 meters from one opening. Brushes must be sized specifically for each duct size; Scand Tech USA brushes or equivalent. If brushing is required, whip brushes must be used on all square or rectangular ducts.
- Upon successful completion of the visual inspection, aggressive air sampling within the work area shall be performed as described in Variance Decision File No. 05-0427. Prior commencement of this clearance air sampling, all Walker Duct/Raceway floor opening access ports shall be opened to the work area and leaf blower directed into access port openings

9. Large non-porous unventilated equipment that cannot be moved manually may be cleaned in place and left uncovered during clearance air monitoring. This equipment will be removed as clean material after the completion of successful clearance air monitoring for the floor containing the equipment.

10. Large non-porous ventilated equipment that cannot be internally cleaned or moved manually may be (i) packaged in a double lined hardwall container, properly labeled as asbestos contaminated waste, and staged for removal by mechanical means after the completion of the abatement phase; or (ii) mechanically cut, as needed, to reduce the size of these components for handling and/or complete decontamination.

11. Porous demolition debris and porous material within the work area shall be disposed of as asbestos waste.

12. Non-porous salvage items may be (i) disposed of as asbestos waste or (ii) decontaminated and released as specified in Industrial Code Rule 56-8.2.

13. An equipment decontamination area shall be cordoned off within the work site for cleaning heavy equipment, e.g. backhoes, excavators, loaders. The floor surface in this decontamination area shall be plasticized and banked on the side to confine the contaminated wastewater.
    - Equipment shall be washed with water after which all exposed surfaces of the equipment shall be manually wet wiped. Upon completion of the decontamination procedures, the interior of the equipment decontamination area shall be wet wiped.
    - The floor surface below the equipment decontamination area shall be cleaned and any residual asbestos contamination shall be removed and disposed of as asbestos-contaminated waste.
    - Wastewater shall be confined within the equipment wash area and shall be collected and filtered through a system with at least 5.0 micron particle size capability prior to discharge.

The following identify specific additional work procedures to be followed:

Exterior Gash Area General Sequence:

1. Area preparation consisting of the installation of a caulked, sealed barrier with rigid sheathing covered with two layers of fire retardant 6-mil poly on the Building interior side in compliance with ICR 56-8.1(k)(1) and ICR 56-8.1(k)(2), adhering to requirements approved by a New York State Licensed Professional Engineer. This barrier shall enclose the opening in the exterior façade;
2. Installation of HEPA ventilation equipment as required;
3. Demolition of the existing wall separating the gash area from the remaining floor space in order to access the ACBM wall/floor joint tar paper existing at its base;
4. Cleaning of walker ducts/raceways in these areas will be done in conjunction with cleaning of these systems in the adjacent interior containment;
5. Detail cleaning of work area; and
6. Clearance air monitoring shall be performed at the completion of all work within each negative pressure work area.

Netting Removal

1. Existing building netting shall be removed as scaffold is erected.
2. Access to the active work area on the scaffold will be restricted. The work area on the scaffold shall be cordoned off with barrier tape.
3. Only NYSDOL and NYCDEP certified asbestos workers shall be permitted within the work area. The vacating of each work area and warning signs shall comply with ICR 56-8.1(b).
4. One layer of poly or rubber mat shall be installed on the scaffold work area floor.
5. Once the scaffold is prepared, the netting will be misted with an amended water solution prior to cutting and/or HEPA vacuumed (depending upon dust concentrations), then cut under wet conditions into manageable sections.
6. Removed netting will be properly bagged or wrapped in two (2) layers of poly in preparation for transportation and disposal as asbestos waste.
7. Once netting is removed, the exposed cables and tiebacks will be wet wiped, and thereafter may be removed as clean material. The cleaned cable or tiebacks may remain for removal during subsequent deconstruction.
8. If at any time a worker has to pass through an uncontaminated area to access the remote decon unit or the next work area, the worker shall don two suits of PPE, remove one suit while in the work area, wet wipe the inner suit, don a clean suit and proceed either to the next work area or the decon unit.

Exterior Negative Pressure Tent Enclosures

1. Exterior Negative Pressure Tent Enclosures shall be utilized, as required, to clean and release contaminated areas exterior to the Building. Exterior negative pressure tent enclosure work areas shall be utilized to remove exposed exterior spray-on fireproofing ("SOFP"). The quantity of SOFP removed within a single negative pressure tent should be limited to removal of a maximum of approximately one-hundred sixty (160) square feet. For removal of exposed exterior SOFP, construction of multiple enclosures shall be required to ensure the quantity within a single tent does not exceed one-hundred sixty (160) square feet. Procedures for establishing, cleaning, clearing and maintaining Exterior Negative Pressure Tent Enclosures are described below.

2. The Negative Pressure Tent Enclosure will be installed exterior to the building on a scaffold system. A Remote Personnel Decontamination Enclosure System, otherwise consistent with the requirements of ICR 56-9, shall be utilized.
3. If at any time a worker has to pass through an uncontaminated area to access the remote decon unit or the next work area, the worker wearing two suits of PPE shall remove one suit while in the work area, wet wipe the inner suit, don a clean outer suit and proceed either to the next work area or the decon unit.
4. Negative Pressure Tent Enclosures shall be constructed and used per the 05-0427 Variance Decision dated May 11, 2005 including but not limited to two (2) layers of six mil fire-retardant polyethylene sheeting and shall include walls, ceiling and a floor (except for portions of floors walls and ceilings that are removal surfaces) with double-folded seams. Exterior tents will be constructed with an attached 3'x 3' airlock. Make-up air shall be provided from the exterior to the tent through the airlock.
5. Bulk removal of SOFP shall be performed using manual means (i.e., wet scraping) with local HEPA ventilation.
6. Upon completing the removal of SOFP, the surfaces from which SOFP have been removed and the interior surfaces of the tent will be thoroughly HEPA vacuumed and wet-wiped.
7. Personnel exiting the Negative Pressure Tent Enclosure shall proceed to the Remote Personnel Decontamination Enclosure System.
8. Once tent enclosure work area preparation has been completed and abatement activities commence, on a daily basis and per work-shift, one (1) air sample shall be collected within the tent enclosure entrance/exit and exterior to the tent as required.
9. Clearance air sampling will be conducted inside the tent, prior to tent removal.

Roof, Façade and General Exterior Area Clean-up

The roof, building façade and exterior areas requiring general clean-up will be cleaned in accord with NYCDEP WTC Dust/Residue Roof & Façade Cleaning procedures provided in the NYSDOL Variance Decision File No. 05-0427, dated May 11, 2005.

Disassembly of Clean and Contaminated Interior Vertical Shafts

Clean vertical shafts which are of CMU construction shall remain sealed from contaminated areas and may remain in place for demolition and disposal as clean material during Phase II deconstruction.

Vertical shafts (both clean and contaminated) which are not CMU, will not necessarily be removed as part of the wall to wall gut conducted on each floor and may be maintained intact for use during cleanup of subsequent Work Area Groupings. Such vertical shafts shall be disassembled as follows.

A negative pressure tent consisting of two layers of six mil poly shall be constructed to enclose the area surrounding the section of the vertical shaft to be removed. The tent shall be sealed at the top and the bottom of the section of vertical interior shaft to be removed. The tent on each floor shall consist of four walls and a floor. The walls shall be attached directly to the underside of the metal ceiling deck. A minimum of an OSHA Class I 3-chamber decon shall be utilized. Barrier tape and signage shall be placed surrounding the negative pressure tent at a minimum distance of twenty-five (25) feet, where practicable. The interior of the negative pressure tent

shall be considered the work area.

HEPA ventilation units shall be installed within the tent to maintain a minimum of six (6) air changes per hour. Clean make-up air shall be provided to the tent from clean areas adjacent to the tent which have been previously cleared as part of the wall to wall gut on the balance of each floor.

Waste generated during the vertical shaft disassembly shall be properly packaged in a leak-tight waste container within the tent. The exterior surface of the leak-tight waste container shall be wet-wiped and appropriate waste bag/container decontamination procedures shall be utilized when transferring waste bags /containers through the attached decon.. Personnel in proper PPE who have not entered the work area shall enter and remain within the decon during bag-out. These personnel shall properly place and seal the containerized waste within a second leak-tight container, wet-wipe the exterior of the second container and place the properly packaged waste outside the decon for transfer to the waste trailer or waste repackaging area. Waste shall not be stored within the decon. Upon completing gross removal and disassembly of the entire length of vertical shaft wall being removed, the entire negative pressure work area shall be cleaned using HEPA vacuuming and wet-wiping. The exposed interior layer of poly in the negative pressure tent shall be lightly misted with encapsulant. Encapsulant shall not be applied to any surfaces which have been the subject of abatement. Upon completion of a minimum four-hour settling/drying period the interior of the tent shall be inspected. If all surfaces are verified to be clean and dry, aggressive clearance sampling may be performed. Upon satisfactory completion of aggressive clearance air sampling, the tent may be disassembled and disposed of as asbestos waste

Rooftop Cooling Tower Transite and Caulking Materials

1. The work area shall be cordoned off with barrier tape or line and shall be accessible through only one entrance/exit. The asbestos work area shall extend beyond the active abatement area to the roof edge or a maximum distance of twenty five (25) feet, whichever is less.

2. In areas where these distances are not attainable due to obstructions (equipment, structural components) an orange construction fence shall be erected at the furthest point achievable to demarcate the work area.

3. The work area below the materials to be removed shall be plasticized using a drop cloth consisting of six mil fire retardant poly. The poly shall extend outward from below the active abatement area at least ten (10) feet, where possible.

4. The area surrounding the cooling tower and roof top penthouse from which transite or caulking is to be removed shall be platicized using two (2) layers of at least six mil poly. That poly shall extend outward on the surface of the rooftop from the perimeter of the structure for a distance of at least six (6) feet.

5. Uncertified persons shall not be permitted within the work area. The vacating of each work area and warning signs shall comply with ICR 56-8.1(b).

6. All openings (including, but not limited to windows, doors, ducts, and grilles) on the roof level within fifty (50) feet of the active abatement area shall be sealed with two (2) layers of at least six mil poly.

7. The transite and caulking materials shall be removed using manual methods whenever possible. HEPA filtered local exhaust ventilation shall be utilized, as required by Industrial Code Rule 56-7.1(j), whenever removal of ACBM requires the use of power tools.

8. Precautions shall include, but not be limited to, the use of amended water to adequately wet the transite panels and the use of controlled methods to lower the panels. The transite panels shall be transferred to a waste consolidation area for packaging prior to being lowered to ground level for placement into a transportation container. Properly packaged and labeled waste will be transferred from the ground level staging area to the transport container.

9. Caulking shall be wetted with amended water during removal and immediately placed in asbestos disposal bags of at least six mil poly and sealed airtight.

10. Personal protective equipment as required by Industrial Code Rule 56-4.1(d) shall be provided and used by all personnel within the work area.

11. A personnel decontamination enclosure system "remote" from the work area but otherwise compliant with Subpart 56-9, shall be utilized. The personnel decontamination enclosure shall be removed only after satisfactory clearance air monitoring results have been achieved.

12. The Contractor shall establish an equipment area adjacent to the regulated work area for the decontamination of employees and their equipment. This equipment area shall consist of an area covered with an impermeable drop cloth (two (2) layers of six mil poly, at a minimum) on the horizontal working surface. The equipment area shall be of sufficient size to accommodate cleaning of equipment and removing the outer disposable personal protective clothing without spreading visible accumulations of contamination beyond the equipment area boundaries.

13. Air sampling and analysis shall be conducted, in each work area, according to the requirements of Subpart 56-17. An area sample will be taken within ten (10) feet of the work area boundary in an adjacent non work area, for each day of work in that area.

14. In addition to the requirements of Subpart 56-17, air monitoring of the entire work area shall be conducted when abatement activities are being conducted. If air sample results indicate any airborne asbestos fiber concentration(s) at or above 0.01 fibers per cubic centimeter, or the background level, whichever is greater, work shall be stopped immediately, methods shall be altered to reduce the airborne asbestos fiber concentrations(s) to the aforementioned level and work shall not resume until that level is attained.

15. If at any time a worker has to pass through an uncontaminated area to access a remote decontamination unit or the next work area, the worker shall don two suits of PPE, remove one suit while in the work area, wet wipe the inner suit, don a clean suit and proceed either to the next work area or the decontamination unit.

Non-Friable Exterior ACBM Waste Consolidation Area

1. The Contractor shall establish a waste consolidation area in close proximity to the regulated work area for the preparation and packaging of non-friable exterior ACBM waste for transportation and disposal. The waste consolidation area shall consist of an area covered with an impermeable drop cloth (consisting of two (2) layers of six mil poly, at a minimum) on the floor/deck or horizontal working surface.

2. The waste consolidation area shall be of sufficient size to accommodate consolidation and packaging of waste.

3. The waste consolidation area shall be enclosed with barrier tape at a minimum distance of ten feet from the edge of the impermeable drop cloth.

4. Prior to being removed from the waste consolidation area, all waste will be wrapped in two (2) layers of 6-mil poly, sealed leak tight.

The exterior surface of the properly packaged waste shall be wet-wiped prior to removal from the waste consolidation area. Properly packaged waste will be transported from the waste consolidation area directly to the disposal container.

2.11 MOVEMENT OF MATERIALS/ WASTE

Waste Movement via Contaminated Interior Shafts

One or more contaminated interior vertical shafts may be maintained to provide for transport of (a) containerized waste from the active abatement area to the waste re-packaging area and/or (b) properly packaged waste to the waste decon for final packaging prior to transport from site. The contaminated interior shafts will be isolated from any floor within the active Work Area Grouping where gross removal and gross cleaning has been completed. The contaminated interior vertical shaft shall remain isolated from all cleaned areas and non-active abatement areas. A curtained doorway shall be constructed at the lowest point of egress from the interior contaminated vertical shaft. The curtained doorway shall be connected by a two (2) layer poly tunnel to the waste re-packaging area. A by-pass area for properly packaged and labeled asbestos waste may be installed within the waste re-packaging area leading directly to the waste decon attached to the waste re-packaging area. Bulk packaged material or waste not packaged for final disposal shall be brought through the tunnel into the waste re-packaging area for final packaging and labeling. The waste re-packaging area, tunnel and waste decon shall be maintained under negative pressure with eight (8) air changes per hour during the entire abatement project. At the completion of all abatement activities, the curtained doorway shall be cleaned, all surfaces within the waste re-packaging area, tunnel and waste decon shall be thoroughly cleaned using HEPA vacuuming and wet-wiping. At the completion of the first cleaning a visual inspection shall be performed to verify the work area is clean. The exposed interior layer of poly within the negative pressure work area shall be lightly misted with encapsulant. Encapsulant shall not be applied to any surfaces which have been the subject of abatement. Upon completion of a minimum four-hour settling/drying period the interior of the

work area shall be inspected. If all surfaces are verified to be clean and dry, aggressive clearance sampling may be performed. Upon satisfactory completion of aggressive clearance air sampling, the waste re-packaging area and tunnel may be disassembled and disposed of as asbestos waste. The curtained doorway shall be removed only when disassembly of the interior vertical shaft has been completed after successful air clearance sampling.

Waste Handling

It is anticipated that a high volume of asbestos waste, including ACBM, settled dust, and materials impacted by settled dust, will be generated during this project. Therefore, conventional bagging of all asbestos waste on a project of this size would result in generation of very large waste volumes for handling and packaging, an increase in the number and/or size of trucks required for waste transportation, an increase of off-site burial volume, and require workers to hand process waste in a time- and labor-intensive manner. A variance from ICR 56 was requested to reduce the volume of asbestos waste trucked through Lower Manhattan, reduce the volume of waste to be placed in landfills, and minimize workers' direct handling and packaging of asbestos-contaminated waste.

Waste streams may be processed utilizing double lined bulk transfer containers with closing lids and transferred directly into double lined disposal containers using a dust-free inclined chute as described below. All such materials also will be handled and disposed of as asbestos wastes, at a minimum, in accordance with applicable federal, state and local laws.

Upon removal, ACBM and SOFP will be packaged into properly labeled leak-tight containers (e.g., bags, gaylord boxes, drums) for handling and disposal as asbestos wastes, at a minimum, in accordance with applicable federal, state and local laws**.**

The removal of large sheet metal sections and steel components will require use of heavy equipment to move and lower them to grade level. Moveable equipment remaining within the negative pressure work area will be either cleaned or removed during the abatement phase (Phase I) of the project. Fixed objects within the negative pressure work area will be either cleaned or removed during the abatement phase (Phase I) of the project.

The majority of the large sheet metal and steel components will be washed and decontaminated for release as clean salvage. Porous materials will be properly packaged for disposal as asbestos waste (at a minimum) and lowered to the ground using controlled methods (e.g., hoists).

Removal of non-porous, non-movable salvage shall be performed in compliance with 56-8.2(a).

Use of a Portable Bulk Shredder

The project may be performed using a portable bulk shredder for processing of the asbestos-contaminated waste in order to facilitate its transport to a waste re-packaging station. If a portable bulk shredder is utilized, it shall remain within the active negative pressure work area during use. A portable shredder may be utilized for processing of compatible building materials waste streams contaminated with settled dust such as, for example, wall board. ACBM will not be processed through the shredder.

If a portable shredder is utilized, upon removal from the substrate, waste materials shall be thoroughly wetted and placed into a portable bulk shredder. These materials shall be wetted while in the portable bulk shredder.

Waste processed through the portable bulk shredder shall be packaged into properly labeled leak tight containers for disposal as asbestos waste, at a minimum. All such materials will be treated and disposed of as asbestos wastes at a minimum. Local HEPA ventilation exhaust equipment shall be utilized to minimize and filter emissions from the portable bulk shredder system.

The feasibility of small portable shredders for use within the active abatement areas is currently being evaluated. Consideration is also being given to use of a truck mounted shredder(s) as part of centralized waste re-packaging area. Therefore, specific information relating to manufacturer specification is under review. However, either approach will include construction of secondary containment which encloses the area surrounding the shredding equipment and the bagging/ containerization area. Use of supplementary engineering controls is also planned for use with this equipment. Supplementary engineering controls may include, but not be limited to, use of HEPA equipped negative ventilation for general area ventilation within the secondary containment, HEPA equipped negative ventilation equipment for localized ventilation and/or use of misting or other dust suppression techniques.

Material Transport

Waste materials from the abatement project will be wetted with amended water and placed into lined and covered bulk material containers staged within the active work area. Inclined chutes will not be utilized for transfer of asbestos-containing or asbestos-contaminated waste from the asbestos project work areas. The containers shall be lowered using controlled methods (hoist, elevator) to the waste re-packaging area which is tentatively proposed to be on the Mezzanine Level. The containers will be moved into the secondary containment area constructed around the waste re-packaging area. The use of an “inclined dust-free chute” shall be in conformance with the requirements of ICR 56-12(d) and will be limited to transport of waste from the waste re-packaging area to the waste transport container. It is anticipated that the secondary containment enclosing the waste re-packaging area will be located on the Mezzanine level and the waste container will be located at ground level. The exact location of the waste re-packaging area and transport container will be determined upon finalization of both the site traffic and staging logistics plan.

Use of a Dust-Free Inclined Chute Directly into a "Bladder" Bag Installed within the Waste Container for use within a Negative Pressurized Containment Waste Repackaging Regulated Area

1. If the bladder bag waste container option is utilized, the removed ACBM (and other asbestos waste if deemed suitable by the contractor) shall be transported for disposal in a hinged-top six-sided hard wall container (“disposal container”) lined with a "bladder" bag. The "bladder" bag shall consist of a pre-fabricated fire-retardant multi-layered leak-tight container with a nominal 20-millimeter (“mil”) thickness.

2. The chute shall be air and dust tight along its lateral perimeter and at the terminal connection to the "bladder" bag at ground level.

3. Prior to transport from the site, the bladder bag within the disposal container shall be wrapped and sealed and the top of the disposal container shall be closed and sealed over the top of the load. The upper end of the chute shall be furnished with a hinged lid, to be closed when the chute is not being used.

4. Disposal containers staged and loaded within the Building or active work area shall be enclosed within a fully framed and sheathed enclosure of sufficient size to accommodate the entire disposal container. The interior of the disposal container enclosure shall be fully lined with at least two (2) layers of six millimeter (6-mil) polyethylene sheeting ("poly") and sealed with tape. A minimum of eight (8) air changes per hour shall be maintained within the disposal container enclosure.

5. Prior to transport from the work site, the disposal container will be disconnected from the chute and sealed air and dust tight utilizing 6-mil poly and tape. The asbestos waste will be transported in the disposal container in accordance with applicable federal, state and local laws.

6. Asbestos contaminated tools and equipment shall be decontaminated by utilizing the attached waste decontamination enclosure system ("waste decon") in conjunction with the applicable requirements of Subpart 56-5.1. Storage of waste materials in the clean room area of the personnel decon shall be prohibited.

7. The exterior surfaces of waste containers shall be thoroughly decontaminated by wet wiping and/or HEPA vacuuming prior to release from the site.

Use of a Dust-Free Inclined Chute Directly into a Double Lined Waste Container for use within a Negative Pressurized Containment Waste Repackaging Regulated Area

1. If the chute to double-lined container option is utilized, removed ACBM and other asbestos wastes shall be transported for disposal in a hinged-top six-sided hard wall container ("disposal container") lined with a two (2) layers of 6-mil fire-retardant poly.

2. The chute shall be air and dust tight along its lateral perimeter and at the terminal connection to the Double Lined Waste Container at ground level.

3. Prior to transport from the site, the 6-mil poly within the disposal container shall be wrapped and sealed and the top of the disposal container shall be closed and sealed over the top of the load. The upper end of the chute shall be furnished with a hinged lid, to be closed when the chute is not being used.

4. Disposal containers staged and loaded within the Building or active work area shall be enclosed within a fully framed and sheathed enclosure of sufficient size to accommodate the entire disposal container. The interior of the disposal container enclosure shall be fully lined

with at least two layers of 6-mil poly and sealed with tape. A minimum of eight (8) air changes per hour shall be maintained within the disposal container enclosure.

5. Pending disposal, asbestos-contaminated waste shall be placed in the disposal container with at least 6-mil plastic draped loosely over the sides to facilitate being wrapped over the top of the load and sealed prior to transport from the site.

6. Prior to transport from the work site, the disposal container will be disconnected from the chute and sealed air and dust tight utilizing 6-mil poly and tape. The asbestos waste will be transported in the disposal container in accordance with applicable federal, state and local laws.

7. Asbestos contaminated tools and equipment shall be decontaminated by utilizing the attached waste decon in conjunction with the applicable requirements of Subpart 56-5.1. Storage of waste materials in the clean room area of the personnel decon shall be prohibited.

8. The exterior surfaces of waste containers shall be thoroughly decontaminated by wet wiping and/or HEPA vacuuming prior to release from the site.

2.12 WASTE PACKAGING AND LOAD OUT PROCEDURES

Packaging of deconstruction waste (ACBM, asbestos and COPC contaminated materials and settled dust) shall conform to the requirements outlined within Waste Sampling Plan found within Section 1 of the Deconstruction Plan. Potential waste streams include the following: asbestos; hazardous; universal; and regulated. The handling, packaging and storage of these materials shall comply with all applicable federal, state and local statutes, rules, and regulations. Specific requirements for decontamination of waste containers and load out through decontamination enclosure systems are outlined below:

A. Decontamination of Impermeable Containers and Non-porous Building Materials: The following procedure shall be used when removing wastes from the work area for load out through the waste decontamination enclosure system:

   1. Waste shall be placed within properly labeled disposal containers in accordance with the waste characterization. Large items not able to fit into disposal containers shall be wrapped in two (2) layers of 6-mil thick plastic sheeting. Clean outer covering of waste containers by wet cleaning and/or HEPA vacuuming in the work area before transferring such items into the decontamination enclosure system.

   2. Waste shall be transported from the upper floors via the exterior hoist or designated internal elevator. Waste leaving individual floors via exterior hoist, shall pass through a waste decontamination enclosure on that particular floor. Waste leaving the individual floors via the internal elevator shall be taken to the waste decontamination enclosure system on the first floor. The waste shall then be transported by the use of a plastic dolly or other necessary means to a

temporary on site storage area applicable to the specific waste stream or loaded directly onto a transport vehicle.

3. Load-out of containers from the decontamination enclosure holding area shall be performed by workers who have entered the equipment decontamination enclosure system from the uncontaminated non-work area. Workers moving waste to storage areas or directly onto transportation vehicles shall do so in overalls of a color different than from those being used in the work area. Workers shall not enter from uncontaminated areas into the equipment washroom or the work area. Contaminated workers shall not exit the work area through the equipment decontamination enclosure system.

4. Thoroughly clean the equipment decontamination enclosure system immediately upon completion of the waste load-out activities, and at the completion of each work shift.

2.13 TRANSPORTATION AND DISPOSAL OF WASTE

Transportation and disposal of deconstruction waste shall conform to the requirements outlined within Waste Management Plan found within Section 1 of the Deconstruction Plan. Potential waste streams include the following: asbestos; hazardous; universal; and regulated.

A. Documentation

1. All asbestos waste shall be transported to a licensed and permitted disposal facility using a properly completed and original "Waste Shipment Record" form. This form shall be signed and dated by the Abatement Subcontractor, the Contractor and the Waste Transporter, and a copy retained by each party as responsibility for the waste is transferred to the next party. All original shipping records and waste receipts shall be provided to the Contractor with copies to the Environmental Consultant Project Monitor and the Owner.

2. All hazardous waste shall be transported to a licensed and permitted disposal facility using a properly completed and original "Hazardous Waste Manifest". The Abatement Subcontractor and the Waste Transporter shall sign the manifest. All original documents shall be provided to the Contractor with copies to the Environmental Consultant Project Monitor and the Owner.

3. All universal waste shall be transported to a licensed and permitted disposal facility using a properly completed and original "Universal Waste Manifest". The Abatement Subcontractor and the Waste Transporter shall sign the manifest. All original documents shall be provided to the Contractor with copies to the Environmental Consultant Project Monitor and the Owner.

4. All regulated waste shall be transported to a licensed and permitted facility using a properly completed and original "Non-hazardous Waste Manifest". The

Abatement Subcontractor and the Waste Transporter shall sign the manifest. All original documents shall be provided to the Contractor with copies to the Environmental Consultant Project Monitor and the Owner.

5. The intent is to provide a complete and unbroken chain of a custody and disposal record for the Owner's permanent record.

B. Transporting Waste

1. Trucks hauling waste shall be totally enclosed to prevent loss or damage to waste containers en route to an approved disposal facility. The interior of the vehicles transporting only asbestos waste shall be lined with two layers of 6-mil polyethylene.

2. All vehicles used to transport the waste shall be properly placarded prior to the commencement of loading activities in accordance with all applicable federal, state and local laws, rules, and regulations.

3. For asbestos waste, only sealed packages are permitted to be deposited in a landfill. Damaged, broken seal or leaking packages shall be re-sealed by the transporter or the disposal facility prior to being deposited in the landfill.

4. The Abatement Subcontractor will insure that the transporter chosen to haul the waste does so in a way that insures the integrity of the waste during shipment.

5. All transporters shall have a written Spill Contingency Plan in place prior to shipping any materials off site. For more detail, refer to Section 1 of the Deconstruction Plan ("Waste Management Plan for the 130 Liberty Street Deconstruction Project").

C. Disposal.

1. Disposal manifest will be submitted to the Contractor for information verification.

2. The Abatement Subcontractor will 1) maintain the copies of each waste manifest during project period; 2) within 30 days of shipment, provide a transporter manifest, a bill of lading or landfill receipt ticket duly executed by the Abatement Subcontractor, transporter and disposal facility. In addition, a final project report shall be submitted by the Abatement Subcontractor within the same time frame. The documents will be all inclusive describing:

    a. Volume/quantity of materials

    b. Dates of transport, name of transporter, driver and vehicle number

    c. Date of receipt and disposal

3. The registered waste hauler will transport waste directly to the approved disposal, recycling or transfer facility. Travel routes as proposed within Section 1 (Waste Management Plan) of the 130 Liberty Street Deconstruction Plan shall be strictly followed. No intermediate storage of waste material (i.e., Abatement Subcontractor's warehouse) will be permitted.

4. At the completion of the Phase I deconstruction activities the Abatement Subcontractor will submit a certification letter, in a form acceptable to the LMDC, Contractor, and Environmental Consultant Project Monitor, verifying that the waste disposal documentation tendered throughout the duration of the project is a true and complete copy and that all waste generated at this work site has been transported and disposed of according to applicable regulation and pursuant to law.

5. Upon review of the documents and certification by the Abatement Subcontractor that all waste has been disposed of pursuant to applicable law, the Environmental Consultant Project Monitor will approve the project close out.

2.14 ON-GOING AIR MONITORING

A. The Environmental Consultant Project Monitor is responsible for the project area Air Monitoring. Daily reports will be sent to the Contractor for record keeping purposes. The Environmental Consultant Project Monitor is to provide for all air monitoring and related activities, separate and independent of that being performed by or for the Abatement Subcontractor, as required and specified in applicable laws, rules, and regulations.

B. Daily air monitoring shall be performed each day. Full workshift daily air monitoring shall be conducted during any period of asbestos disturbance (including pre-cleaning, set up, abatement/cleaning, final cleaning and waste removal).

C. During deconstruction, air monitoring outside of the Building will continue on a daily basis, 24-hours per day, regardless of whether work is or is not occurring in the Building. The nature and scope of this monitoring is set forth in the Air Monitoring Section of the Deconstruction Plan

D. All pre-abatement, progress, and final clearance air monitoring will be done in accordance with NYSDOL ICR 56 requirements, this plan, and any site specific variances. COPCs will not be sampled within the interior of the Building except as part of the clearance process.

1. Background air sampling: Background air sampling will not be conducted since static area air sampling has been performed on an on-going basis at the site since 2001.

2. Pre-abatement sampling: The Environmental Consultant Project Monitor shall perform pre-abatement area monitoring during preparatory activities as required

by ICR 56-17.2 during each abatement sequence.

3. Progress air sampling data will be evaluated by the Environmental Consultant Project Monitor on a daily basis (this evaluation will be included in the daily reports to the Contractor). Any progress air samples noted to be equal to or greater than 0.01 f/cc or background levels must be brought to the immediate attention of the Contractor. Work will be stopped immediately within the impacted area and barriers inspected and repaired as necessary. Abatement methods will be altered to reduce airborne fiber concentration(s) to the aforementioned level and work will not resume until that level is attained. Surfaces outside the work area are to be HEPA vacuumed or wet cleaned prior to resuming removal work.

   Two samples shall be collected exterior of the work area within 10 feet of the containment barrier.

   One area sample shall be taken within ten feet of each unobstructed negative pressure ventilation equipment "group" exhaust.

   One area sample shall be taken in the uncontaminated area exterior of the personnel decontamination enclosure system. One area sample shall be taken in the uncontaminated area exterior of the waste decon area.

   One exterior building sample shall be taken.

   In a typical four-floor sequence, a minimum of twenty-two (22) during abatement samples will be collected on a daily basis. Sample numbers may vary depending on number of floors per sequence.

   In addition to the minimum number of samples required by NYS ICR 56, additional samples deemed necessary by the Environmental Consultant Project Monitor will be collected. Additional samples shall be collected if multiple entrances are utilized in an abatement sequence or if the numbers of AFDs are increased based on change in the containment layout.

Air Monitoring of Negative Filtration Unit Exhaust

Each floor in the work area is approximately 35,000 square feet with an average ceiling height of thirteen (13) feet. More than twenty (20) operating HEPA-filtered negative ventilation units will be required to maintain the required air change rates on each floor.

Negative ventilation unit exhausts shall be placed into groups not to exceed five (5) units. One extra group of five (5) HEPA-filtered negative ventilation units shall be installed per work area as a back-up.

One area sample per day shall be taken within ten (10) feet of each unobstructed negative pressure ventilation equipment "group" exhaust. Should an air sample fail, proper response shall include shutting down group of units, activating back-up group of units, repairing units, and performance of multiple rounds of individual unit exhaust air sampling, as defined in the variance decision conditions. An access port will be cut into the rigid barrier to provide access for placement of an exterior air sampling monitor. The access port shall remain sealed during sampling and when not in use.

An Interior Negative Pressure Tent Enclosure, as described in this plan, will be used and maintained to create the air sampling access port for negative air exhaust air sampling at each bank of negative exhaust air filtration unit manifolds, should exterior access be restricted. This tent enclosure will also be used to access the air sampling port to facilitate negative air exhaust air sampling exterior to the building. The interior tent enclosure will be maintained until final clearance air sampling is performed.

If an elevated exhaust air sample is obtained, the bank of 5 units with the elevated result will be shut down, the units and filters inspected, repaired/changed out as necessary, and then put back into service. Each of those five units will be sampled independently for a minimum of three days to ascertain if any problems still exist. Upon receipt of additional elevated air sample results, the affected unit(s) will be taken out of service and removed from the work area for appropriate repair.

2.15 AIR CLEARANCES

HEPA ventilation units shall be operated at a maximum of two (2) air changes per hour during clearance sampling.

Clearance air monitoring may be performed on individual floors within the active Work Area Grouping as follows. The floor(s) to be cleared individually will be isolated from the balance of the Work Area Grouping at the completion of gross removal and gross clean-up within the floor(s) to be cleared. Airlock(s) with a minimum dimension of 3'x 3' will be constructed at (a) the entrance to the clean vertical shaft on the isolated floor(s) and (b) at the entrance to the isolated floor(s) from the balance of the Work Area Grouping. Personnel proceeding to the isolated floor in the final cleaning stage shall don two suits within the personnel decon, and shall then remove their outer suit prior to entering the airlock at the entrance to the isolated work area that is in the final cleaning stage. Upon achieving satisfactory clearance air sampling results, the cleared floor shall be isolated from the balance of the Work Area Group**.**

Upon completion of all work within each floor of the negative pressure work area the following work practices will apply:

- The entire work area shall be thoroughly washed (a pressure wash system may be used) using amended water and HEPA vacuumed dry.

- All standing water shall be collected by HEPA vacuuming or mopping the area. All standing water shall be removed.
- Wall/Floor poly, as applicable, shall be encapsulated and removed. All standing water shall be removed.

Following a minimum drying time of four (4) hours after wet cleaning has been completed, an authorized and qualified individual, independent of the removal project, such as the Project Monitor or Design Engineer, shall determine if the surfaces in the work area are dry and free of dust and debris. Once the accessible work area has been inspected and found to be clean and dry, aggressive clearances may be performed.

The asbestos abatement portion of the project shall be considered complete within each work area when the area is visually clean of all dust and the results of aggressive interior air clearance sampling, collected following "aggressive" air sampling techniques as per ICR 56 17.2 (f), are below the asbestos clearance criteria of 70 structures/mm^2 (collected and analyzed in accordance with AHERA TEM protocols) A minimum of five (5) air samples shall be collected and analyzed per work area. A minimum of five (5) asbestos air samples per floor will be collected. Where areas fail the visual inspection or the average concentration of the five (5) samples exceeds 70 structures/mm2, [m8]the work area must be re-cleaned and re-tested until successful air clearance is achieved.

In addition to the asbestos abatement clearance air sampling, a minimum of five (5) air samples shall be collected per floor following "aggressive" air sampling techniques and analyzed for all of the contaminants listed below. The sampling may be performed concurrent with or subsequent to asbestos abatement clearance air monitoring. Although the asbestos abatement cleanup portion of the project under ICR 56 will be deemed complete following receipt of successful TEM clearance air sample results, containments will remain and the area will be sampled and re-cleaned, as and if necessary, to achieve the following supplemental air clearance levels:

Metals (NIOSH protocols)	**Clearance Level**
Antimony	250 ug/m^3
Barium	250 ug/m^3
Beryllium	1.0 ug/m^3
Cadmium	5.0 ug/m^3
Chromium (III)	250 ug/m^3
Copper	500 ug/m^3
Lead	25 ug/m^3
Manganese	100 ug/m^3
Mercury	12.5 ug/m^3
Nickel	50 ug/m^3
Zinc	1,000 ug/m^3

PART 3 - PRODUCTS

3.01 MATERIALS

Materials provided under this section shall be standard products of manufacturers regularly engaged in the production of such materials and shall conform to federal, state, and city regulations and requirements specified herein. Materials listed under this section "or equal" shall be provided for work. Note: all applicable spent materials will undergo a waste characterization in accordance with protocols outlined within Section 1 of the Deconstruction Plan.

A. Polyethylene or poly: Fire retardant polyethylene of 6-mil thickness shall be provided in rolls of sizes that will minimize the frequency of joints. Fire retardant polyethylene sheet may be used for plasticizing the enclosed work area, for preparation of the decontamination enclosure system and for waste packaging.

B. Duct Tape: Duct tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheeting to finished surfaces without damage to existing finish and shall be capable of adhering under both dry and wet conditions, including use of amended water. When used on windows the tape shall be ultra violet light stable and shall not leave residue when removed. Nashua 357 Black Duct Tape or equivalent shall be used for all window applications. This tape can be used for all applications relative to this project.

C. Surfactant: Surfactant (Wetting Agent) shall consist of resin materials in a water base which has been tested to ensure materials are non-toxic and non-hazardous. Surfactants shall be installed according to the manufacturer's written instructions.

D. Caulking Sealant: Caulking sealant shall be single component, non-sag elastomer with 1600% elongation capacity. Sealant shall meet the requirements of Federal Specification TT-S-00230C, Class A Type II. Sealant may be used to form an airtight seal around plywood barriers or temporary partitions, to seal along the seams of the decontamination enclosure system's plywood sheathing and to seal around piping or other small penetrations of the work area. Sealant application shall be according to the manufacturer's written instructions.

E. Encapsulant: A liquid material which can be applied to a surface in order to "lock down" any materials on that surface by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).

F. Foam Sealant: Foam Sealant shall be expanding urethane Class 1 foam sealant with a Underwriters Laboratories, Inc. (U.L. 723) flame spread index of 25 or less, smoke developed index of 0, and a minimum operating temperature range between -30^{o}F and 250^{o}F.

G. Plywood: Plywood used for temporary partitions, decontamination enclosure systems and tunnels shall be an exterior grade and a minimum 3/8-inch thick.

H. Spray Adhesive: Spray Aerosol Adhesive shall be specially formulated to stick to sheet polyethylene (3M 76, 3M 77, or equivalent).

I. Other Materials: All other materials such as lumber, plywood, tools, scrapers, brushes, cleaning materials, adhesive, nails, hardware, etc. which are required to perform the work described in this Section shall be provided. Materials and equipment shall be new or used, uncontaminated by asbestos, in serviceable condition and appropriate for the intended purpose.

J. Disposal Bags: Plastic Disposal Bags shall be a minimum of six mils in thickness. Bags shall be labeled in accordance with this Section.

K. Shipping Containers for asbestos waste: Impermeable Containers shall be suitable to receive and retain any asbestos-containing or asbestos-contaminated materials until they are disposed of at an approved landfill. The containers shall be labeled in accordance with this Section. Containers shall be both airtight and watertight and conform to DOT Standard 49 CFR 178.224. Each container shall be constructed of fiber, hard plastic or metal with locking, airtight lids.

L. Markings and Labels for asbestos waste: Disposal bags and shipping containers shall bear danger labels, transportation packaging labels and generator identification information. Labels shall be permanently affixed to all bags and shipping containers containing asbestos waste material, in accordance with OSHA Standard 29 CFR 1926.1101(k)(2), DOT Standard 49 CFR Part 171 and 172 and EPA Standard 40 CFR Part 61.150(a)(1)(v).

M. Shipping Containers for hazardous, universal and regulated non-hazardous waste: these materials be handled, packaged, transported and disposed of in accordance with procedures outlined with the Waste Sampling Plan found within Section 1 of the Deconstruction Plan. Markings and Labels for hazardous, universal and regulated non-hazardous waste shall be in accordance with the requirements outlined within the Waste Management Plan found within Section 1 of the Deconstruction Plan as well as all applicable federal, state and local regulations.

N. Warning Signs: Warning Signs shall be posted at the perimeter of the work area and every potential entry point into the work area prior to abatement operations in accordance with OSHA Standard 29 CFR 1926.1101. Danger sign format and color shall conform to OSHA Standard 29 CFR 1926.200. The signs shall display the legend indicated below:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

3.02 EQUIPMENT

All equipment provided shall conform to applicable federal and state regulations, local codes and the requirements specified herein.

A. The Abatement Subcontractor shall maintain on site an emergency generator capable of powering all active work areas, the Personnel and Waste Decontamination Enclosure System, and to maintain required negative pressure in the event of a power failure.

B. Communication Equipment: Devices suitable for inter-room communications such as "walkie-talkies" or "radio band" communicators shall be provided.

C. Spraying Equipment: Equipment used to apply amended water or removal encapsulant shall be of a low pressure type to prevent disturbance of the asbestos prior to physical controlled removal. Airless spray equipment shall be provided for the application of asbestos encapsulant.

D. Vehicles: Trucks or Vans used for the transportation of waste shall be enclosed and suitable for loading, temporary storage, transit and unloading of waste without exposure to persons or property.

E. Fall Protection Equipment: Certified and approved equipment to be used by trained personnel when working at elevation to protect against falling from an elevated work area.

F. Water Filtration System: A system capable of filtering and retaining particles larger than 5.0 microns in size shall be provided.

G. Carts: Provide water tight wheeled carts with tight fitting lids suitable for movement of waste from the decontamination enclosure system to the waste storage area or transport vehicle.

3.03 WORKER PROTECTIVE CLOTHING AND EQUIPMENT

A. Protective Clothing: Workers shall be provided with sufficient sets of properly fitting, full-body, disposable coveralls, head covers, gloves and 18-inch high boot-type foot covers. Disposable coveralls, head covers and 18-inch high boot-type foot covers shall be constructed of material equal to DuPont "TYVEK-Type 14" or Kimberly-Clark "Kleenguard" as a minimum requirement.

1. The Abatement Subcontractor shall provide authorized visitors and the Environmental Consultant Project Monitor suitable properly fitting protective disposable clothing, headgear, hard hats, eye protection and footwear (up to four sets per 8-hour shift) whenever they are required to enter the work area.

B. Equipment: Eye protection and hard hats shall be utilized at all times on this project everywhere within the established site perimeter in accordance with the HASP.

C. Respiratory Protection: The Contractor and Subcontractors shall be responsible for providing adequate respiratory protection for their staff at all times in the work area. Types of respirators used shall be approved by MSHA/NIOSH for asbestos and the identified COPCs in accordance with all applicable federal, state, and city regulations. The Contractor and Subcontractor shall provide a level of respiratory protection to ensure personnel exposures are below all applicable permissible exposure limits.

3.04 NEGATIVE PRESSURE FILTRATION SYSTEM

The Abatement Subcontractor will provide enough HEPA filtered negative air units to meet the requirements of the site specific variance and maintain negative pressure drop of at least -0.02 inches water column as verified by continuous recording digital manometers located throughout the work area. The Abatement Subcontractor will demonstrate the number of units needed per work area for the required air changes by calculating the volume flow rate (cfm) delivered by each unit under a 2-inch pressure drop across filters. The Abatement Subcontractor shall further determine the best placements for all HEPA filtered negative air units on any given floor given its configuration and the focus of the Work activities at any given time as well as other pertinent factors to ensure the optimum air filtration is achieved. All units shall be equipped with an operating audible alarm to signal a loss of filtration below an established level.

Preliminary calculations, based on 4 air changes per hour, indicate a need for twenty-two (22), 1,500 cfm negative air units per floor. This is determined by utilizing the formula (CF/(CFM * 15M) = # of units needed) wherein CF represents the volume of the enclosure, CFM represents the capacity of the filtration unit and 15M represents fifteen (15) minutes required for a complete air change. The average volume of air space per floor is 480,000 cubic feet. The exact number of units on each floor shall be field verified based on the cubic footage per floor. On the fifth floor mechanical space where the height of the ceiling deck is twice that of the other floors, twice as many negative air units shall be utilized to achieve the required pressure differential.

One (1) additional bank of five (5) negative exhaust air units will be installed in each work area as a back-up to maintain the minimum required air changes per hour should a primary bank of five (5) units be taken out of service during required shutdowns. If an elevated exhaust air sample is obtained, the bank of five (5) units with the elevated result will be shut down, the units and filters inspected, repaired/changed out as necessary, and then put back into service. Each of those five units will be sampled independently for a minimum of three days to ascertain if any problems still exist. Upon receipt of additional elevated air sample results, the affected unit(s) will be taken out of service and removed from the work area for appropriate repair.

The Environmental Consultant Project Monitor may reject any HEPA filtered negative air units that are deemed to be unacceptable or performing marginally based on visible inspection or performance.

The HEPA filtration ventilation units will be exhausted to the exterior of the building by use of

flexible duct connection and existing window portals or the Abatement Subcontractor shall create additional portals sufficient for the number of negative air units. The flex duct will extend outside the window and window portal a distance of approximately one (1) foot or less.

A. Abatement Subcontractor will provide:

1. Manufacturer's product data on the HEPA units.

2. Methods of supplying adequate power to the units and designation of panels supplying power.

3. Description of testing methods for correct airflow and pressure differential and manufacturer's product data on a pressure differential monitor.

B. Negative Air Machines (HEPA Units):

1. Cabinet: Will be constructed of steel or other durable materials able to withstand damage from rough handling and transportation. Width of the cabinet should be less than thirty (30) inches to fit through standard-size doorways. The cabinet will be factory sealed to prevent asbestos-containing dusts from being released during use, transport or maintenance. Access to and replacement of all filters will be from an intake end. The unit will be mounted on casters or wheels.

2. Fans: Rate capacity of fan according to usable air-moving capacity under actual operating conditions. Use a centrifugal-type fan.

3. Final Filters: The final filter will be the HEPA type. The filter media (folded into closely pleated panels) must be completely sealed on all edges with a structurally rigid frame:

a. Locate a continuous rubber gasket between the filter and the filter housing to form a tight seal.

b. Each filter will be individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.03 um diotcylphthalate (DOP) particles. Testing will be according to Military Standard MIL-STD-282 and Army Instruction Manual 136-300-175A. Each filter will bear a UL586 label to show ability to perform under specified conditions.

c. Each filter will be marked with: the name of the manufacturer, serial number, air-flow rating, efficiency and resistance and the direction of test air flow.

4. Pre filters: To protect the final filter by removing the larger particles, pre filters are required to prolong the operating life of the HEPA filter. Two (2) stages of pre filtration are required. The first-stage pre filter will be a low-efficiency type (e.g., for particles 10 um and larger). The second-stage pre filter will have a medium efficiency (e.g., effective for particles down to 5 um). Pre filters will be installed either on or in the intake grid of the unit and held in place with special housings or clamps.

5. Instrumentation: Each unit will be equipped with a Magnetic gauge or manometer to measure the pressure drop across filters and to show when filters have become loaded and need to be changed. Provide units equipped with an elapsed time meter to show the total accumulated hours of operation. Units shall also be equipped with an audible alarm indicating that the pressure drop across the filters has dropped below requisite levels.

6. Safety and Warning Devices: Provide an electrical (or mechanical) lockout to prevent the fan from operating without a HEPA filter. Units will be equipped with automatic shutdown system to stop the fan in case of major rupture in the HEPA filter or blocked air discharge. Warning lights are required to show normal operation, too high a pressure drop across the filters (i.e., filter overloading), and too low a pressure drop (i.e., major rupture in HEPA filters or obstructed discharge).

7. Electrical components will be approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL). Each unit will be equipped with overload protection sized for the equipment. The motor, fan, fan housing and cabinet will be grounded.

C. Use of System During Abatement Operations

1. Exhaust units shall be started before commencing Phase I Abatement clean-up work. [m12]After abatement work has begun, units shall run to maintain a negative pressure until satisfactory clearance air monitoring results have been achieved for the work area. Units shall not be turned off at the end of the work shift or when abatement operations temporarily stop.

2. Do not shut down negative air system during abatement operations procedures unless authorized by the Environmental Consultant Project Monitor.

3. To the extent practical, start abatement work at a location furthest from the decontamination units and proceed toward them. If an electric power failure occurs, immediately stop all removal work and do not resume until power is restored and all exhaust units are operating again. The Personnel and Waste Decontamination Enclosure Systems shall be sealed so as to avoid the release of dust for the duration of any power loss event and remain sealed until power and negative pressure has been adequately re-established.

4. At completion of abatement work, allow exhaust units to run as specified under this section to remove airborne particles that may have been generated during abatement work and cleanup and to purge the work area with clean makeup air. Units will be required to run after decontamination and during final air sampling until final air clearance testing and inspections are completed.

D. Dismantling the System: When a final inspection and the results of the final air tests show that the area meets the requirements for clearance, exhaust units may be sealed and removed from the work area.

HEALTH AND SAFETY PLAN
FOR THE
130 LIBERTY STREET BUILDING
DECONSTRUCTION PROJECT

June 13, 2005

Lower Manhattan Development Corporation
1 Liberty Plaza
New York, New York 10006

HASP approved by: _____ Date: _____

Affiliation: _____

HASP approved by: _____ Date: _____

Affiliation: _____

HASP approved by: _____ Date: _____

Affiliation: _____

Revised by: _____ Date: _____

Affiliation: _____

Revised by: _____ Date: _____

Affiliation: _____

NYCSSM approval: _____ Date: _____

Affiliation: _____

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LIST OF ACRONYMS

ABIH	American Board of Industrial Hygiene
ACGIH	American Conference of Governmental Industrial Hygienists
AL	Action Level
ANSI	American National Standards Institute
APR	Air-Purifying Respirator
CFR	Code of Federal Regulations
CGI	Combustible Gas Indicator
CIH	Certified Industrial Hygienist
COPCs	Contaminants of Potential Concern
CPR	Cardiopulmonary Resuscitation
CRZ	Contamination Reduction Zone
dBA	decibels adjusted (decibels on the "A" scale)
EC	Emergency Coordinator
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
ER	Emergency Response
ERT	Emergency Response Team
EZ	Exclusion Zone
f/cc	Fibers per cubic centimeter
FEC	Facility Emergency Coordinator
GFCI	Ground Fault Circuit Interrupter
H&S	Health and Safety
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCP	Hazard Communication Program
HCS	Hazard Communication Standard
HEPA	High Efficiency Particulate Air
HMTA	Hazardous Materials Transportation Act
IC	Incident Commander
IDLH	Immediately Dangerous to Life and Health
lbs	pounds
LEL	Lower Explosive Limit

LIST OF ACRONYMS (CONTINUED)

LMDC	Lower Manhattan Development Corporation
MAWP	Maximum Allowable Working Pressure
mg/m^3	milligrams per cubic meter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NYCDEP	New York City Department of Environmental Protection
NYCSSM	New York City Site Safety Manager
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limits
PM	Project Manager
ppm	parts per million
psia	pounds per square inch, absolute
psig	pounds per square inch, gauge
Q&P	Quality and Protection
SAR	supplied air respirator
SCBA	self-contained breathing apparatus
SOW	Scope of Work
SSHO	Site Safety and Health Officer
STEL	Short-Term Exposure Limit
SZ	Support Zone
TWA	Time-Weighted Average
WTC	World Trade Center

1.0 INTRODUCTION

This Health and Safety Plan (HASP) presents the practices and procedures that the Contractor shall implement and enforce during the deconstruction of the building located at 130 Liberty Street in New York City (the Building). This HASP will be applicable to all persons entering the Building and to all persons working in and around the Building.

This HASP covers the activities to be undertaken during the Deconstruction Project, which will occur in the following three phases:

- Preparation Phase
- Phase I – Asbestos and COPC Abatement and Removal
- Phase II – Structural Deconstruction

The Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, erection of sidewalk sheds, and the removal of existing netting on the exterior of the building.

Phase I of the Deconstruction Project will occur while the work area is placed under negative pressure containment and includes the following general categories: (a) the general area cleanup of WTC dust and debris, (b) removal and disposal of installed porous and certain non-porous building materials and components, (c) cleaning and salvage of certain installed non-porous building equipment and components, (d) removal of building materials containing asbestos which were present in the Building prior to September 11th, 2001 (referred to herein as "ACBM"), primarily within the Building interior, (e) packaging of asbestos and other regulated waste including, but not limited to light bulbs, lighting ballasts, batteries, mercury-containing thermostats, etc.) at generation points, movement of containers to the decontamination unit and movement of decontaminated containers to waste loading using an exterior hoist or crane. The proposed clean-up and abatement will be conducted so that the Building can be safely deconstructed in Phase II of the Deconstruction Project in compliance with applicable law to allow for redevelopment of the WTC site.

Phase II will include the cleaning of exterior surfaces of the building (i.e. building washdown) and the systematic floor-by-floor deconstruction and removal of the remaining "clean" building components including exterior curtain wall, concrete deck, large mechanical equipment and structural steel components. Included in Phase II will be the abatement and removal of roof-top asbestos-containing cooling tower transite materials, rooftop caulking and asbestos-containing caulking found on the aluminum column covers and fascia.

The Contractor shall be supported on this project by various subcontractors. Subcontractors shall:

- Provide environmental testing, air sampling and asbestos and COPC project monitoring (Contractor's Environmental Consultant including the function of Environmental Consultant Project Monitor)
- Perform cleaning activities to remove WTC dust, perform ACBM abatement and removal of building materials/components (Abatement Subcontractor)
- Provide miscellaneous support of Deconstruction activities, e.g., plumbers, electricians, elevator operators; service personnel, etc.

Organization charts for the 130 Liberty Street Deconstruction Project project can be found in Attachment-1. The Contractors and first tier Subcontractors, and Standard Safety Operating Procedures will be submitted to the Owner prior to start of work.

1.1 BACKGROUND

The events of September 11, 2001, which caused the destruction of the WTC Towers, physically destroyed portions of the interior and exterior of the 130 Liberty Street Building. The massive debris generated from the collapse of the WTC South Tower broke numerous windows and opened a gash ("Gash Area") in the Building's north wall extending from the 7th to 24th floors, thereby exposing portions of the interior of the north side of the Building allowing dust and debris to enter into the Building. The Building has remained idle since September 11, 2001.

Subsequent to September 11, 2001, operations were undertaken to clear debris from the plaza in front of the building, lobby and interior spaces in the Gash Area. Porous geosynthetic mesh or "netting" was hung on the outside of the Building. The Gash Area was cleaned to permit the

construction of columns, beams and floor decks to stabilize the Gash Area. Once the initial limited cleaning and stabilization measures were in place, office furniture, equipment and other non-attached items in the Building were removed and disposed of by then-owner Deutsche Bank.

As part of the WTC area redevelopment, the Lower Manhattan Development Corporation (LMDC) purchased the Building from Deutsche Bank. The LMDC plans call for removing the Building and using the property for the development of the WTC complex.

1.1.1 Environmental Study

LMDC retained The Louis Berger Group, Inc. to conduct an Initial Building Characterization Study for the 130 Liberty Street building. As part of that characterization, the settled dust in and on the Building was sampled throughout the Building and analyzed for five Contaminants of Potential Concern (COPCs) designated by the United States Environmental Protection Agency (USEPA) as being associated with the WTC dust (i.e., asbestos, dioxin, lead, polycyclic aromatic hydrocarbons [PAHs] and crystalline silica) as well as other contaminants suspected of being present in the Building including polychlorinated biphenyls (PCBs) and heavy metals (barium, beryllium, cadmium, copper, manganese, mercury, nickel and zinc). The findings of the characterization concluded that COPCs in varying concentrations are present throughout the WTC dust found within and on the Building.

To supplement the data collected in the Initial Building Characterization Study, LMDC retained TRC Environmental Corporation (TRC) to conduct a Supplemental Investigation of the Building. This Supplemental Investigation included a survey sampling for additional unidentified asbestos-containing building materials (ACBM) as well as WTC dust impacted surfaces (both accessible and inaccessible and interior and exterior) and mold, and included a preliminary waste characterization of the WTC dust, glass and WTC dust contaminated porous building materials. The findings of this report identified (i) additional ACBM, (ii) additional surfaces with COPC contamination, (iii) additional mold contamination, and (iv) in one composite sample collected from the 40th floor mechanical space, cadmium within the dust in excess of 40 CFR 261.24 limits. TRC's preliminary waste characterization testing within the small number of samples collected and analyzed revealed no COPCs within dust contaminated porous materials that were

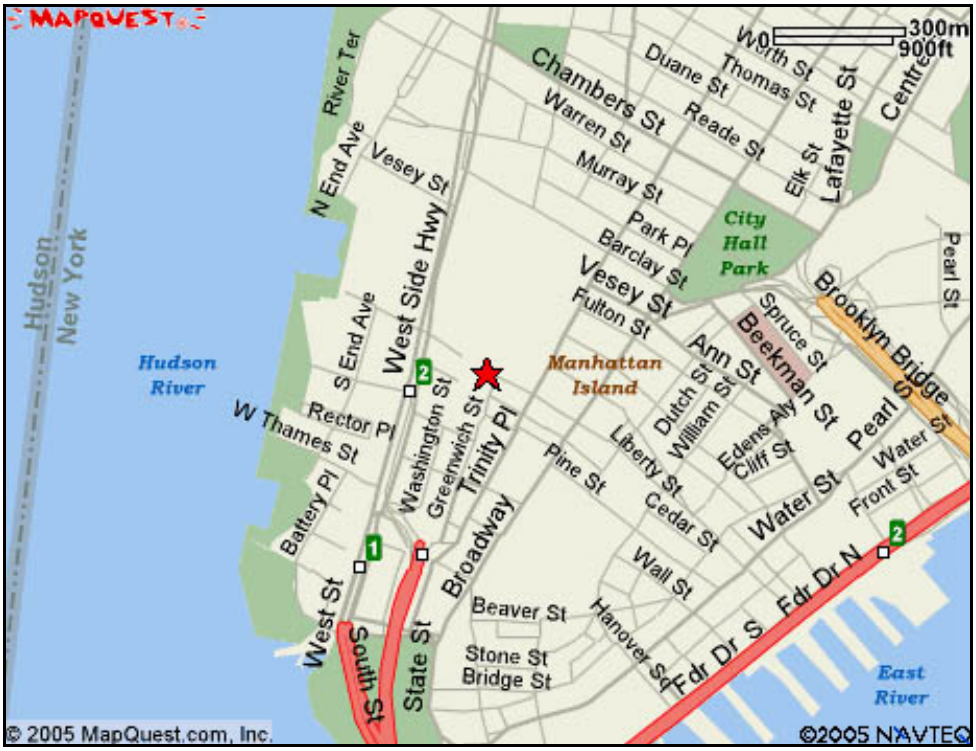
above the 40 CFR 261.24 limits. The Supplemental Investigation also determined that the exterior glass (once cleaned) associated with the Building would not be considered a hazardous waste for selenium.

The requirements outlined within this Health and Safety Plan are based upon the data collected to date. As additional information is obtained during the course of the Deconstruction Project activities, these requirements will be amended if necessary to protect workers or the public.

1.2 SITE DESCRIPTION

130 Liberty Street is a 40-story, 565 foot tall, approximately 1.4 million square foot (SF) office building, with two basement levels, located in Lower Manhattan, one block south of the WTC site. Until 1999, the Building, which was built between 1973 and 1974, was owned by the Banker's Trust Corporation. In 1999, Deutsche Bank acquired the Building and owned it until August 31, 2004, when it was sold to LMDC.

Figure 1-1
Site Location Map



1.3 PURPOSE

This document presents the safety procedures and practices to be followed during all Deconstruction Project site activities to ensure the safe completion of tasks. The procedures and practices herein are designed to prevent occupational injuries and exposures to chemical, physical and biological hazards to workers at the Site. The procedures are presented to ensure compliance with all applicable government agencies and regulations, including requirements and protocols established by: the Occupational Safety and Health Administration (OSHA); the National Institute of Occupational Safety and Health (NIOSH); the United States Environmental Protection Agency (USEPA); the New York State Department of Conservation (NYSDEC); the State of New York, New York State Department of Labor (NYSDOL); the New York City Department of Environmental Protection (NYCDEP); and the City of New York.

This document incorporates relevant health and safety guidance outlined in the August 2003 "Health and Safety Plan for Protection Against Environmental Contaminants," written by RJ Lee

Group, Inc., and amended by TRC Environmental Corporation in August 2004 (known as the "Site Specific Health and Safety Plan For 130 Liberty Street"). All relevant hazards and protective standards referenced therein are incorporated into this document.

Once this HASP is approved by the regulators as part of the Deconstruction Plan, the requirements outlined in the Site Specific Health and Safety Plan for 130 Liberty Street will be superseded by the requirements of this HASP. This HASP is no less stringent than the current Site Specific Health and Safety Plan for 130 Liberty Street. This HASP has been developed by the Contractor's Environmental Consultant; however, the Contractor's New York City Site Safety Manager (NYCSSM) is responsible for its implementation (directly or through a subcontractor) and enforcement.

Compliance with this HASP is required due to structural and environmental damage suffered by the Building on September 11, 2001, hazards associated with the Building's current condition and anticipated abatement and deconstruction activities. This HASP is based upon current knowledge of conditions at the Site and shall be updated as new information becomes available and/or conditions change within the Building.

1.4 OBJECTIVES

This HASP addresses activities in all three phases of the deconstruction including the Preparation Phase, Phase I - Asbestos and COPC Abatement and Removal and Phase II - Deconstruction. This HASP has been developed to provide the minimum requirements for protecting the workers and the public from the hazards that may exist during the Deconstruction project. This HASP must be supplemented with a Contractor Site Specific Safety Plan to address the site construction safety issues associated with this project.

The Preparation Phase includes the erection of scaffolding and hoists on the full extent of the exterior of the building, erection of sidewalk sheds, and the removal of existing netting on the exterior of the building. Of particular concern during this phase is the penetration of the building envelope for tie-ins for the erection of the scaffold and hoists and the handling and removal of existing netting on the exterior of the building.

The entire interior of the Building with the exception of the steel, concrete deck, non-porous stairs, shafts and large scale MEP components, will be removed under Phase I. During all Phase I activities, a minimum buffer zone of three floors initially for the top three floors and then two floors thereafter, will be maintained between the active abatement and clean-up (Phase I) area and the structural deconstruction (Phase II) portion of the project.

It is anticipated that approximately four floors shall be placed under containment in accordance with Section 4 - Asbestos and COPC Abatement and Removal Plan, at any given time. Additionally, the Abatement Subcontractor shall coordinate with all involved parties to assure that a three-floor buffer zone is maintained for the initial top three floors and there after a two-floor buffer zone will be maintained between the work activities of the Abatement Subcontractor and the Demolition Subcontractor. Both Subcontractors must closely coordinate to ensure that the Phase II work that will be occurring above poses no potential for negative impact to the Phase I operations and protective measures.

The Environmental Consultant Project Monitor (as defined in Section 4 - Asbestos and COPC Abatement and Removal Plan) shall conduct regular safety inspections to assure that the work is conducted in accordance with this HASP. During all three phases, the Abatement Subcontractor shall perform personnel air sampling for asbestos and COPCs, as required by OSHA, to evaluate the exposures to all personnel and to ensure use of the proper personal protective equipment (PPE), i.e., respirators, gloves and protective clothing. Additionally, the Environmental Consultant Project Monitor shall collect daily area air samples for asbestos as required by NYSDOL and as described in Section 4 - Asbestos and COPC Abatement and Removal Plan.

Phase II deconstruction activities impacting potential hazardous materials are largely a subset of those encountered in Phase I. In addition, work activities of concern specific to Phase II, which are addressed in this HASP, include torch cutting of structural steel members that may be painted with coatings containing lead and other heavy metals, emissions from work on steel including torch cutting, as well as exposure to silica during concrete removal operations. .

2.0 HEALTH AND SAFETY PROCEDURES

This section identifies the principle hazards associated with the tasks to be performed during the Deconstruction Project, and establishes standard safety and health procedures for the Contractor, the Subcontractors and anyone who comes onto the site. The content of this HASP is designed to anticipate, identify, evaluate, and control safety and health hazards for the work activities to be performed during this project. All on-site work activities by any Subcontractors and their designees shall be performed in accordance with this HASP, and in accordance with applicable federal, state, and local regulations.

The levels of personal protection and the procedures specified in this Plan are based on the best information available from validated reference sources (i.e., OSHA, NIOSH) and current site data. Therefore, the guidelines presented in this HASP represent the minimum health and safety requirements to be observed by all on-site personnel engaged in this project. Discovery of currently unknown site conditions or changes in the scope of work will necessitate the reassessment of the protection levels, controls, and procedures stated herein. All amendments to this HASP must have prior written approval by the Environmental Consultant's Certified Industrial Hygienist (CIH) and the Contractor's Project Manager; all modifications/amendments shall be enforced by Contractor's New York City Site Safety Manager (NYCSSM).

2.1 PERSONNEL RESPONSIBILITIES

The Contractor, Subcontractor and other personnel on-site shall review and understand this document prior to working on-site. All personnel shall:

- Participate in initial site orientation/training as described in Section 2.9.1, and daily safety meetings, and shall provide any required documentation, medical clearance, fit test, asbestos certification, etc. prior to starting work on the site. Documentation requirements are determined by activities to be performed.
- Sign the HASP Acknowledgement Form and other required documents after orientation to indicate that they participated in orientation and understood the information presented in orientation.
- Follow the designated safety and health procedures; be alert to the hazards associated with working on the site, and exercise reasonable caution at all times.

Any questions or concerns about this HASP shall be directed to the on-site Contractor NYCSSM and/or HASP Administrative Monitor.

The Contractor and Subcontractors personnel involved in the 130 Liberty Street deconstruction project are responsible for:

- Taking all reasonable precautions to prevent injury to themselves and to their fellow employees, and being alert to potentially harmful situations.
- Obeying all applicable laws and regulations relating to health and safety.
- Ensuring that activities do not impact the neighboring community.
- Performing only those tasks that they have been trained to complete and can do safely.
- Notifying their supervisor of any special medical conditions (i.e., allergies, contact lenses, diabetes) that may affect their ability to perform certain tasks.
- Notifying their supervisor of any prescription and/or non-prescription medication that they may be taking that might cause drowsiness, anxiety, or other unfavorable side affects.
- Learning and complying with Site security requirements.
- Complying with the Site's prohibition on drug and alcohol use, smoking, horseplay, and restricted eating/drinking areas.
- Practicing good housekeeping by keeping the work areas neat, clean and orderly.
- Immediately reporting all injuries, incidents and near-misses to the designated supervisor.
- Properly using PPE specified by the contractor and this HASP, based on the results of air monitoring.
- Properly maintaining their designated PPE per manufacturers' recommendations.
- Complying with the HASP and all health and safety recommendations and precautions.
- Notifying their supervisor of any Site conditions or concerns which are not addressed by the protective measures specified in this HASP, or which are addressed but the employee does not understand the protective requirements specified herein.

2.1.1 Contractor

The Contractor Project Manager shall have overall responsibility for ensuring health and safety protection on the site and for ensuring that all elements of the HASP are implemented during all phases of the daily on-site activities of this project.

A licensed NYCSSM shall be on-site throughout the project and shall have the primary daily responsibility for ensuring the implementation of this HASP. The Contractor NYCSSM shall notify the Environmental Consultant's CIH of any need to change or amend any aspect of this HASP and/or seek input with regard to interpretations of the HASP in concert with the designated Safety Officers of the Subcontractors. The Contractor NYCSSM shall coordinate the health and safety activities of all the Contractor and Subcontractor personnel to ensure the requirements of the HASP are followed and shall communicate with all parties when changes occur on-site or when conditions impacting the site occur concerning the response actions to be taken.

2.1.2 Subcontractors

Each Subcontractor on the job is responsible for:

- Preparing a Subcontractor HASP specific for their scope of work (SOW)
- Having a supervisor on-site who understands the scope of the work to be performed, potential health and safety issues associated with that SOW and the strategies for managing and controlling the health and safety issues.
- Planning all work activities to prevent personal injury, health impairment and property damage.
- Providing a Subcontractor Safety Officer and Alternate Safety Officer who shall remain on-site for the entire duration of the Subcontractor's SOW and ensure employee compliance with the provisions of this HASP and the Subcontractor HASP.
- Ensuring that Subcontractor personnel are qualified to perform the SOW that they are assigned.
- Communicating with the Contractor NYCSSM and other potential affected Subcontractors when work on-site conditions are identified that can impact health and safety on the job.

- Ensuring training (asbestos, HAZWOPER, Hazard Communication, etc.) of the Subcontractor's employees in the recognition, avoidance and control of chemical, biological and physical hazards present at the Site.

- Maintaining records for Subcontractor employees as required by this HASP (including but not limited to) medical, training and fit-test records.

- Providing daily health and safety briefings to their personnel.

- Providing specified PPE, including training for correct use and maintenance of that equipment.

- Providing adequate weather protective gear for their personnel as required for their work activities.

- Maintaining a system of prompt detection and correction of unsafe practices and conditions for their SOW and employees.

- Ensuring that Subcontractor's subcontractors and suppliers comply with the conditions of this HASP upon entrance to the Site.

- Collecting personal air samples for both asbestos and other COPCs for HASP and OSHA compliance. Each Subcontractor's CIH or qualified Industrial Hygienist (IH) is responsible for the development and implementation of a personal air-monitoring program in accordance with OSHA Standard 29 CFR§1926.1101 and 29 CFR §1910.1000 and good industrial hygiene practices.

2.1.3 New York City Site Safety Manager (NYCSSM)

The Contractor NYCSSM is an experienced safety and health professional who maintains current HAZWOPER training, American Red Cross Cardiopulmonary Resuscitation (CPR) training, first aid certification and automated external defibrillator (AED) training, and has completed at least eight hours of Safety Officer training. Additionally, the Contractor NYCSSM has the relevant site experience and training (with respect to asbestos and other hazardous materials identified) as necessary to oversee all work activities associated with the cleaning and demolition effort.

The Contractor NYCSSM has the following responsibilities:

- Direct the implementation and enforcement of this HASP and consult with the Subcontractors regarding the health and safety procedures and practices to be used on this project.

- Enforce the requirements of this HASP with respect to health and safety, air monitoring requirements and waste management requirements.

- Have the authority to suspend work activities if actions occur that may affect safety and health conditions for personnel or the environment. The Contractor NYCSSM shall act as the primary contact during any on-site emergency situation.

- Assist and represent the Contractor Project Manager in performing on-site training and the day-to-day on-site implementation and enforcement of the HASP.

- Be on-site during the project on a full time basis for the entire duration of on-site field activities. If operations are performed during more than one work shift per day, a qualified Contractor NYCSSM shall be present for each shift.

- Ensure site compliance with federal/state/local regulations and all aspects of this HASP including, but not limited to:

  – Performing activity hazard analyses

  – Providing guidance concerning the use of PPE

  – Ensuring site control

  – Developing standard operating procedures to minimize hazards such as the use of engineering controls

- The authority to stop any and all work activities if unacceptable health and safety conditions exist.

- Consult with and coordinate any modifications to the HASP with the Contractor Project Manager and the Environmental Consultant's CIH; recommend corrective actions for identified deficiencies; and oversee the implementation of any corrective actions.

- Conduct accident investigations and prepare accident reports.

- Investigate and analyze "near-miss" incidents.

- Prepare and maintain records of corrective actions taken on-site and document safety and health findings into a project-dedicated logbook.

2.1.4 Administrative Monitor

The Administrative Monitor (AM) is a support position provided by the Environmental Consultant. The AM performs all orientation regarding on-site health and safety procedures for new employees and visitors. Additionally, the AM is responsible for logging all site visitors,

checking for current medical and fit test certifications and applicable federal/state/local asbestos training for all those entering containment. The AM does not provide specialized training for specific cleaning, abatement or interior component removal portions of the work. This shall be provided by each Subcontractor for its personnel.

The AM documents each orientation performed and requires that each person receiving the orientation complete, sign and date the HASP acknowledgement form. The AM receives the following documentation from each Subcontractor to complete the administrative record for the site: name of Subcontractor's safety officer; list of emergency contact phone numbers; confirmation of current worker fit tests, medical clearances and asbestos training for each Subcontractor employee; and Subcontractor HASP, including Hazard Communication Program, Fall Protection Program, Respiratory Protection Program, personal air monitoring program, and confined space program (when necessary).

The AM is responsible for the execution and monitoring of any health and safety activities at the Site related to Environmental Consultant activities.

2.2 HEALTH AND SAFETY HAZARD ANALYSIS AND RISK ASSESSMENT

2.2.1 Preliminary Evaluation

The work to be conducted at 130 Liberty Street comprises construction activities and, as such, falls under Title 29 of the Code of Federal Regulations, Part 1926 (29 CFR 1926), the OSHA Construction Standard.

An evaluation of the anticipated general work activities was performed (discussed later in this section) that included a Hazard Analysis for each general task/activity to identify associated hazardous conditions, appropriate employee protection methods and PPE requirements. The evaluation of potential site conditions and activity hazards is an ongoing process and shall continue throughout the duration of the project.

Potential hazards during the Deconstruction Project include the following:

- Physical – Excessive noise; inclement weather; heat stress; cold stress; manual lifting; slips and falls; structural integrity; working at elevation; electrical safety; heavy equipment operation; and other general construction hazards.

- Chemical – Asbestos, silica, PAHs, dioxins, man-made vitreous fibers (MMVF), cadmium, nickel, lead, barium, chromium, zinc, manganese, copper, beryllium, PCBs, mercury, copper, zinc, cristobalite and quartz.

- Biological – Mold; rodents; insects; Legionella.

- Radiological – None anticipated.

2.2.2 Task Hazard Analysis

The scope of work for the 130 Liberty Street project consists of five (5) general tasks, as follows:

Task 1: Environmental Consultant monitoring including work area air sampling during Preparation Phase, Phase I and Phase II activities; clearance air sampling upon completion of asbestos and COPC abatement and removal activities; and waste characterization sampling.

Task 2: Maintain temporary services including water risers, fire protection systems building communication system, GFCI protected electrical systems and elevator operation.

Task 3: Preparation for and general area cleanup of WTC dust and debris, which as stated by the regulators must be treated as asbestos (at a minimum) and which may contain other COPCs; removal and disposal of installed porous and certain non-porous building materials and components contaminated by settled dust and debris; cleaning and salvage of certain installed non-porous building equipment and components contaminated by settled dust and debris; removal of ACBM from the Building;; packaging of regulated waste as identified during the implementation of the Waste Sampling and Management Plan found within Section 1 of the Deconstruction Plan [VMC1]at generation points movement of containers to decontamination unit and movement of decontaminated containers to waste loading area; and cleaning of limited, designated exterior surfaces to facilitate the erection of the man-hoist and the crane.

Task 4: Phase II Deconstruction activities including the cleaning of the building exterior (i.e. building washdown), systematic floor-by-floor deconstruction and removal of the remaining "clean" building components including exterior curtain wall, concrete deck, large mechanical equipment and structural steel components. Included in Phase II will be the abatement and removal of roof-top asbestos-containing cooling tower transite materials, rooftop caulking and asbestos-containing caulking found on the aluminum column covers and fascia. Also

included in Phase II is removal of metals-containing coatings from cut-lines prior to torch cutting, as required.

Task 5: General site work, including fencing, erecting scaffolding/hoists, paving, if any, and drainage.

Summaries of the potential physical, chemical and biological hazards that may be encountered during these tasks and the associated hazard control methods are presented in Table 2-1.

Table 2-1

Task 1: Environmental Consultant Air Monitoring and Waste Characterization

Equipment Required: Air sampling equipment, Waste Characterization e.g. (scoops, bowls, scale, safety blades, sample containers), PPE

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
1	Mobilization (Transporting employees, materials and equipment to site)	Level D	Use of vehicles	Vehicle and driving safety	Contractor Specific
2	Unloading equipment on the ground level	Level D	Lifting	Proper lifting techniques	Contractor Specific
			Site security	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Insects	Biological hazard monitoring	
3	Waste characterization sampling	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Heat stress	Heat monitoring	Contractor Specific
			Cold stress	Cold monitoring	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Trespassers	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
4	Area air sampling during abatement activities	Level C***	Asbestos	Avoidance/monitoring	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Heat stress	Heat monitoring	Contractor Specific
			Cold stress	Cold monitoring	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Trespassers	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Mold	Avoidance	Contractor Specific
			Asbestos	Avoidance/Monitoring	Contractor Specific

Task 1: Con't

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
5	Clearance air sampling	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Heat stress	Heat monitoring	Contractor Specific
			Cold stress	Cold monitoring	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Trespassers	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring	Contractor Specific

*As described in Section 2.5
** Procedures are part of Contractors Safety Program
***Per 2.7.2Personal Monitoring

Task 2: Maintaining Temporary Services

Equipment required: Hand and power tools, ladders, PPE

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
1	Mobilization (Transporting employees, materials and equipment to site)	Level D	Vehicle Incidents	Vehicle and driving safety	Motor Vehicles and Equipment Program
2	Unloading equipment on the ground level	Level D	Lifting	Proper lifting procedures	
			Heat Stress	Heat monitoring	
			Cold Stress	Cold monitoring	
			Slip/trip/fall	Housekeeping	Housekeeping Program
			Trespassers	Site security	
			Pinch points	Materials handling	
			Hand tools	Proper use techniques	
3	Maintain basic utilities to include: – Temporary GFCI protected electrical systems – Elevator Operation – stand pipe – Building communication system, etc.	Level C ***	Chemical COPC plus plumbing chemicals	Hazard Communication PPE	Hazard Communication Program, **29 CFR 1910.120 (a) (i)**
			Slip/trip/fall	Housekeeping	Housekeeping Program
			Pinch points	Materials handling	
			Work from elevation	Fall protection. Proper ladder use.	Elevated work- Fall Protection Program
			Hand tools	Proper use techniques	
			Hot Work	Hot Work permitting Fire prevention	Welding, Cutting and Burning - Hot-Work Procedure
			Wet feet	Avoidance/techniques	
			Electrical safety	Electrical safety - LO/TO	Electric -Temporary
			Stored hazardous energy	LO/TO program	Lockout/Tagout Procedures
			Elevator malfunction	Maintain certification and operate according to manufacturer instructions	

*As described in Section 2.5

** Procedures are part of Contractor's Project Safety Plan.

*** Per 2.5.2 Personal Monitoring

Task 3: General area cleanup of WTC dust and debris, as stated by the regulators must be treated as asbestos (at a minimum) and which may contain other COPCs; removal and disposal of installed porous and certain non-porous building materials and components contaminated by settled dust and debris; cleaning and salvage of certain installed non-porous building equipment and components contaminated by settled dust and debris; removal of ACBM within the Building; packaging of regulated waste as identified during the implementation of the Waste Sampling and Management Plan found within Section 1 of the Deconstruction Plan at generation points movement of containers to decontamination unit and movement of decontaminated containers to waste loading area; and cleaning of limited, designated exterior surfaces to facilitate the erection of the man-hoist and the crane.

Equipment required: Heavy cleaning equipment, HEPA vacuums, hand/power tools, ladders, scaffolding, lifting equipment, PPE

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
1	Mobilization (Transporting employees, materials and equipment to site)	Level D	Vehicle use	Vehicle and driving safety	Contractor Specific
2	Unloading equipment on the ground level	Level D	Lifting	Proper lifting techniques	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Trespassers	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
3	Constructing containment areas and placing air handling units on the floors	Level C***	Chemical COPC plus adhesives	Hazard Communication PPE	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Lifting	Proper lifting techniques	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Work from elevation	Fall protection	Contractor Specific
			Use of scaffolds	Scaffold safety	Contractor Specific
			Hand and power tools	Proper use techniques	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
4	Area cleanup of WTC dust and debris, which as stated by the regulators must be treated as asbestos at a minimum	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Lead	Avoidance/monitoring/PPE	Contractor Specific
			PCBs	Avoidance/monitoring/PPE	Contractor Specific
			Mercury	Avoidance/monitoring/PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring/PPE	Contractor Specific
			Mold	Avoidance/monitoring/PPE	Contractor Specific
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
5	Removal and disposal of installed porous and certain non-porous building materials and components contaminated by settled dust and debris	Level C***	COPC, silica and lead	Follow procedures	Contractor Specific
			Lifting	Proper lifting techniques	
			Noise	Hearing protection	
			Heat stress	Heat monitoring	
			Cold stress	Cold monitoring	
			Slip/trip/fall	Housekeeping	
			Structural damage	Structural integrity / PE inspection	
			Demolition	Follow demolition plan	General Safety Regulations
			Pinch points	Materials handling	
			Work at elevation	Fall protection	Fall Protection Plan
			Hand tools	Proper use techniques	
			Inadequate lighting	Illumination	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure
6	Cleaning and salvage of certain installed non-porous building equipment and components contaminated by settled dust and debris	Level C ***	COPC, silica and lead	Follow procedures	Contractor Specific
			Lifting	Proper lifting techniques	
			Noise	Hearing protection	
			Heat stress	Heat monitoring	
			Cold stress	Cold monitoring	
			Slip/trip/fall	Housekeeping	
			Structural damage	Structural integrity / PE inspection	
			Demolition	Follow demolition plan	General Safety Regulations
			Pinch points	Materials handling	
			Work at elevation	Fall protection	Fall Protection Plan
			Hand tools	Proper use techniques	
			Inadequate lighting	Illumination	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure
			Torch Cutting	Generation of lead or other toxics, Fire	Compliance with OSHA Lead and cadmium in Construction Standard, Hot work procedures, Cutting procedures

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
7	Removal of building materials contaminated with asbestos and ACBM.	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Lead	Avoidance/monitoring/PPE	Contractor Specific
			PCBs	Avoidance/monitoring/PPE	Contractor Specific
			Mercury	Avoidance/monitoring/PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring/PPE	Contractor Specific
			Mold	Avoidance/monitoring/PPE	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
8	Packaging of regulated waste as identified during the implementation of the Waste Management and Sampling Plan found within Section 1 of the Deconstruction Plan at generation points, movement of containers to decontamination unit and movement of decontaminated containers to waste loading area.	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Lead	Avoidance/monitoring/PPE	Contractor Specific
			PCBs	Avoidance/monitoring/PPE	Contractor Specific
			Mercury	Avoidance/monitoring/PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring/PPE	Contractor Specific
			Mold	Avoidance/monitoring/PPE	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
9	Cleaning of walker ducts and raceways as per procedures in the 130 Liberty Street Asbestos and COPC Abatement Plan, Section 4 of the Deconstruction Plan	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring /PPE	Contractor Specific
			Lead	Avoidance/monitoring /PPE	Contractor Specific
			PCBs	Avoidance/monitoring /PPE	Contractor Specific
			Mercury	Avoidance/monitoring /PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring /PPE	Contractor Specific
			Mold	Avoidance/monitoring /PPE	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 3: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
10	Bulk removal of sprayed on fire proofing using manual and mechanical means, i.e. scraping or a pressure wash system.	Level C***	Chemical COPC	Hazard Communication PPE	Contractor Specific
			Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Lead	Avoidance/monitoring/PPE	Contractor Specific
			PCBs	Avoidance/monitoring/PPE	Contractor Specific
			Mercury	Avoidance/monitoring/PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring/PPE	Contractor Specific
			Mold	Avoidance/monitoring/PPE	
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 3: Cont'd

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
11	Clean limited, designated exterior surfaces to facilitate the erection of the man-hoist and the crane and installation of interior concrete chute	Level C*** for Tower Crane and for Man-hoist, concrete chute construction+	Working from Elevations	Fall Protection	Fall Protection Plan
			Heat Stress	Heat monitoring	
			Cold Stress	Cold monitoring	
			Slip/Trip/Fall	Housekeeping	
			Lifting	Proper lifting techniques	
			Electrical Sources	Electrical Safety/LOTO	Lock-Out/Tag-Out Program
			Pinch Points	Materials Handling	
			Hand Tools	Proper use techniques	
			Inadequate Lighting	Illumination	
			COPCs and asbestos	Hazard Communication/PPE	Hazardous Materials Communication Program and **29 CFR 1910.120 (a) (i)**
			Structural damage	Structural integrity/PE inspection	
			Noise	Hearing protection	
			Demolition	Follow demolition plan	
			Stored hazardous energy/Gravity	Follow proper procedures	
			Materials handling	Materials handling	
			Cranes/Lifting Equipment	Crane/lifting safety	

*As described in Section 2.5
** Procedures are part of Contractors Project Safety Plan
***Per 2.52
+Due to enclosure and unknown airborne silica concentrations work will have to be performed using PAPR with P100 cartridges and local exhaust ventilation or work will be performed under Level B until air sampling allows otherwise.

Task 4: Phase II Deconstruction activities including exterior cleaning (i.e. building washdown), the systematic floor-by-floor deconstruction and removal of the remaining "clean" building components including exterior curtain wall, concrete deck, large mechanical equipment and structural steel components. Included in Phase II will be the abatement and removal of roof-top asbestos-containing cooling tower transite materials, rooftop caulking and asbestos-containing caulking found on the aluminum column covers and fascia. Also included is removal of heavy metals-containing coatings from cut-lines prior to torch cutting, as required.

Equipment required: Heavy equipment, HEPA vacuums, hand/power tools, ladders, scaffolding, lifting equipment, PPE

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
1	Mobilization (Transporting employees, materials and equipment to site)	Level D	Vehicle use	Vehicle and driving safety	Contractor Specific
2	Unloading equipment on the ground level	Level D	Lifting	Proper lifting techniques	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Trespassers	Site security	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
3	Constructing abatement areas for rooftop transite and caulking and aluminum column covers and fascia	Level C***			
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Slip/trip/fall	Housekeeping	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Lifting	Proper lifting techniques	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Work from elevation	Fall protection	Contractor Specific
			Use of scaffolds	Scaffold safety	Contractor Specific
			Hand and power tools	Proper use techniques	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific

Task 4: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
4	Removal of building materials contaminated with ACBM.	Level C***			
			Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Lead	Avoidance/monitoring/PPE	Contractor Specific
			Other chemicals	Avoidance/monitoring/PPE	Contractor Specific
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

*As described in Section 2.5
** Procedures are part of Contractor's Project Safety Plan.
*** Per 2.5.2 Personal Monitoring

Task 4 Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
5	Packaging of asbestos waste at generation points, movement of containers to decontamination unit and movement of decontaminated containers to waste loading area.	Level C***	Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			High pressure water	Pressurized systems	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Asbestos	Avoidance/monitoring/PPE	Contractor Specific
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
6	Deconstruction of Concrete slabs	Level D	Demolition	Follow demolition plan	Safety Regulations
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Construction Equip	Demolition Safety	Contractor Specific
			Silica	Avoidance/monitoring/PPE	Contractor Specific
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 4: Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
7	Removal of Curtain Wall, Large MEP, Structural Steel	Level D			
			Lifting	Proper lifting techniques	
			Noise	Hearing protection	
			Heat stress	Heat monitoring	
			Cold stress	Cold monitoring	
			Slip/trip/fall	Housekeeping	
			Structural damage	Structural integrity / PE inspection	
			Demolition	Follow demolition plan	General Safety Regulations
			Pinch points	Materials handling	
			Work at elevation	Fall protection	Fall Protection Plan
			Hand tools	Proper use techniques	
			Inadequate lighting	Illumination	
			Torch Cutting (see subtask 8/9)	Generation of lead or other toxics, Fire	Compliance with OSHA Lead and cadmium in Construction Standard, Hot work procedures, Cutting procedures
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 4 Cont'd:

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
8	Metals-Containing Coatings Removal prior to Torch Cutting	Level C***	Working from Elevations	Fall Protection	Contractor Specific
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Electrical sources	Electrical safety - LO/TO	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Use of ladders	Ladder safety	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Inadequate lighting	Illumination	Contractor Specific
			Heavy Metals	Avoidance/monitoring/PPE	Contractor Specific

Subtask #	Activities	PPE Requirements*	Hazards	Preventative Mechanism	Procedure**
9	Torch Cutting of Steel	Level B – Note Level B required for exposure assessment when torch cutting on heavy metals coated materials	Demolition	Follow demolition plan	Safety Regulations
			Heat Stress	Heat monitoring	Contractor Specific
			Cold Stress	Cold monitoring	Contractor Specific
			Pinch points	Materials handling	Contractor Specific
			Hand tools	Proper use techniques	Contractor Specific
			Noise	Hearing protection	Contractor Specific
			Construction Equip	Demolition Safety	Contractor Specific
			Torch Cutting (see subtask 8/9)	Generation of lead or other toxics, Fire	Compliance with OSHA Lead and cadmium in Construction Standard, Hot work procedures, Cutting procedures
			Materials Handling	Proper Materials handling protocols	Contractor Specific
			Cranes/Lifting Equipment	Crane/lifting safety	Crane, Hoist, and Rigging Standard Operating Procedure

Task 5: Site Work (Fencing, Back filling, Paving, and Drainage)

Equipment required: Trackloaders, Skidsteer Loaders, Small Tilt Sladers, Vibratory Rollers, Roller Compactor Truck

Paving: Asphalt Paving Equipment, Smooth Barrel Roller, Forklift, Crane, Area lift.

Subtask #	Activities	PPE Requirements	Hazards	Preventative Mechanism	Procedure
1	Installation of Site fences	Level D	*Moving Equipment *Open excavation * Evacuation of excavations before backfilling	* Hand signals * Barricades * Safety watch	See Items 1-5 Below
2	Back filling	Level D	*Moving Equipment *Open excavation * Evacuation of excavations before backfilling	* Hand signals * Barricades * Safety watch	See Items 1-5 Below
3	Paving	Level D	*Moving Equipment *Open excavation * Evacuation of excavations before backfilling	* Hand signals * Barricades * Safety watch	See Items 1-5 Below
4	Drainage	Level D	*Moving Equipment *Open excavation * Evacuation of excavations before backfilling	* Hand signals * Barricades * Safety watch	See Items 1-5 Below

General Precautions- Site specific precautions to be determined as the detailed scope and schedule are developed.
Care must be taken to reduce the risk of worker injury and property damage during backfilling or paving operations.

1. No backfill shall commence until all workers are clear of the working areas.
2. The operators of any machines or vehicles being used in backfilling operations shall keep other employees in sight at all times.
3. The operators of any truck employed in backfilling operations shall ensure that all workers are in the clear before approaching the ditch or dumping the load.
4. No equipment shall back closer than 1 meter to the edge of any excavation and this set-back shall be increased commensurately with the depth of the excavation unless trenching sleds or other retention devices are employed.
5. No equipment shall dump material closer than 1 meter to the edge of an excavation.

If site conditions change during the course of the deconstruction project, the Environmental Consultant's Safety Officer shall evaluate the new conditions and discuss appropriate amendments to the HASP with the Contractor NYCSSM. The proposed amendments shall be reviewed and approved by the Environmental Consultant's CIH and the Contractor Project Manager.

2.2.3 Physical Hazards

The damage suffered by the building at 130 Liberty Street has resulted in numerous physically hazardous conditions, including damaged electrical sources and components, falling hazards due to openings in the floors, or the possibility of materials falling from overhead. The primary physical hazards that may be encountered during this project include: heavy equipment operation; excessive noise; excessive heat or cold; inclement weather; manual lifting/handling of heavy objects; poor housekeeping; rough terrain; compromised structural integrity; traffic; cranes, hoists and other lifting equipment; aerial lifts and manlifts; working at elevation; use of scaffolding; hazardous materials use; potential utility and electrical sources; use of hand and power tools; slips and falls; etc.

Due to the existence of these hazards, the Contractor NYCSSM shall ensure that all site employees receive hazard awareness training. Additionally, the Contractor NYCSSM shall insure that Subcontractors perform the following operations under the direct on-site supervision of OSHA Competent Persons (provided by the Subcontractors for each task as necessary):

- General Construction (29 CFR 1926.20)
- Unsanitary Conditions (29 CFR 1926.27)
- Rigging (29 CFR 1926.251)
- Scaffolding (29 CFR 1926.450)
- Ladders (29 CFR 1926.1053)
- Personal Fall Arrest Systems (29 CFR 1926.500 and .502)
- Ear Protection (29 CFR 1926.101)

- Cranes and Derricks (29 CFR 1926.550)
- Materials Hoists, Personnel Hoists and Elevators (29 CFR 1926.552)
- Demolition (29 CFR 1926.850)
- Welding/Cutting on surfaces covered by protective coatings (29 CFR 1926.354)
- Excavation (29 CFR 1926.650)
- Lead (29CFR 1926.62)
- Asbestos (29 CFR 1926.1101)
- Cadmium 1926.1127
- Powered Platforms for Building Maintenance, 29 CFR 1910.66
- Hazardous Waste Operations and Emergency Response, 29 CFR 1926.65

2.2.4 Chemical Hazards

A chemical hazard that may be encountered during this project is asbestos. Based upon the most recent pre-demolition asbestos survey conducted by TRC, approximately 2,336,407 square feet of asbestos-containing material, including WTC dust with varying concentrations of some COPCs, has been identified. Therefore, the Contractor NYCSSM shall ensure that all site employees receive the required training concerning asbestos as well as all applicable Hazard Communication training.

In addition, personnel who have the potential to disturb ACBM shall be trained concerning the procedures to be used and requirements for notifications in accordance with federal, state and local regulations. Personnel who handle ACBM on this job shall have the required documented training and certificates. Each employee involved in abatement activities must have completed City of New York asbestos training, shall be a certified asbestos worker and/or supervisor by the City of New York, and shall be certified asbestos handler and/or supervisor by the New York State Department of Labor. Additionally, personnel who will conduct cleaning and abatement activities must have additionally received the required 40-hour training as outlined by 29 CFR 1910.120(a) (i) (HAZWOPER requirement) and appropriate annual refresher training as required. This HAZWOPER training requirement may be removed, should sampling indicate

training requirement downgrade is appropriate. Training, medical and license documentation for each Subcontractor employee shall be verified by the HASP AM prior to start of work by the Subcontractor.

2.2.4.1 Additional Identified Chemicals

Other chemicals identified as potential contaminants that may be encountered during the initial site cleaning activities are PAHs, dioxins, cadmium, nickel, barium, chromium, zinc, manganese, copper, beryllium, PCBs, mercury, copper, zinc, cristobalite and quartz. Environmental sampling in the 130 Liberty Street Building has verified the presence of these chemical contaminants in concentrations exceeding USEPA's Residential Cleanup Criteria as discussed in Berger's September 2004 "Initial Building Characterization Study Report."

Additional chemical hazards generated from deconstruction activities would be lead, cadmium, and chromium from coated surfaces. Subcontractors shall perform personnel monitoring for all COPCs as required by OSHA. In addition, Subcontractors must provide applicable OSHA training for the identified hazards. Documentation of this training must be provided by the Subcontractor.

Additional precautions to be taken in work areas with these contaminants include personnel and area air monitoring. Any torching or cutting of painting surfaces creates risk of lead, cadmium and chromium release. During these operations, additional monitoring and PPE will be necessary as required by the Lead in Construction Standard [29 CFR 1926.62(d)(2)(iv)] and the Cadmium in Construction Standard [29 CFR 1926.112].

Precautions to be taken during the removal of miscellaneous hazardous materials (bulbs, ballasts, batteries, mercury-containing thermostats, etc) are found in Table 2-1, Task 3.

Respiratory protection, as identified within Table 2-1, represents the minimum level of protection for all identified tasks.

There may also be hazardous chemicals brought on-site and used in the deconstruction. The requirements of the OSHA Hazard Communications Standard (29 CFR 1910.1200) shall apply.

Section 2.8 provides information concerning the management of hazardous chemicals on-site and the site Hazard Communication Program.

2.2.5 Biological Hazards

Biological concerns in the work area are primarily, insects, rodents, mold/fungi, and Legionella.

2.2.5.1 Insects

The presence of insects shall be addressed by personnel as the insects are encountered. When a stinging or poisonous insect, such as a bee or spider, is identified, personnel should exercise caution to avoid being bitten or stung for example by using tools to move material. In the event that a person is stung or bitten, the incident shall be reported to the Site Manager for the Subcontractor who shall report the incident to the Contractor NYCSSM. The Site Manager for the Subcontractor shall initiate actions to manage and address the bite or sting. Personnel who are allergic to insect bites and stings should identify their allergy to their employer.

2.2.5.2 Rodents

In the event that rodents or animal pests are identified or observed on-site, the Subcontractor Manager should report the incident to the Contractor NYCSSM. The Contractor NYCSSM shall be responsible for evaluating the condition and implementing steps to eliminate rodents on the site.

2.2.5.3 Mold/Fungi

The Initial Building Characterization Study prepared by Berger and the Supplemental Investigation Report prepared by TRC identified mold contaminated building materials/components within the Building. The identification of additional mold/fungi on-site will be made based on visual inspections of building materials. When mold/fungi are identified, the removal of impacted materials shall be addressed concurrently with Asbestos Abatement Activities. Removal and handling measures shall be consistent with the NYC Department of Health and Mental Hygiene "Guidelines on Assessment and Remediation of Fungi in Indoor Environments."

2.2.5.4 Legionella

The presence of legionella, disease-causing bacteria, has been previously identified in the Northeast secondary water supply on site through historical sampling data. At no time shall any person utilize water from any remnant building structure, including sinks, showers, water fountains or fire connections. Only city supplied water shall be used for Site clean-up activities. No persons shall use any water source that has not been pre-approved and marked for potable use by the Contractor NYCSSM.

2.3 ENGINEERING CONTROLS

Engineering controls will be used as primary protective mechanisms to protect the safety and health of all employees whenever technically feasible, and prior to the implementation of Administrative Controls and/or personal protective equipment. Each Subcontractor shall be responsible for the provision and implementation of the following:

- HEPA-filtered air filtration devices to reduce area dust levels.
- Vacuum cleaners equipped with HEPA filters.
- Fume eductors attached to HEPA filters for all hand-powered tools.
- Removal of all lead-based painted materials (if necessary), and adequate exhaust ventilation provided during torching or cutting activities.
- A buffer zone of at least two (2) floors will be maintained between the work activities of the Abatement Subcontractor and the Demolition Subcontractor on the top three floors, thereafter the buffer zone will be two floors.
- Barricades, railings or other devices to prevent employee exposure to fall hazards or moving equipment per 29 CFR 1926.
- Other task-specific engineering controls as recommended by OSHA guidelines or as recommended by the Contractor NYCSSM.

2.4 ADMINISTRATIVE CONTROLS AND WORK PRACTICES

Each Subcontractor shall utilize administrative controls and work practices as a secondary means of ensuring worker health and safety when engineering controls do not provide sufficient

protection or are technically infeasible. Each Subcontractor shall be responsible for the provision and/or implementation of the following:

- Ensuring all employees are enrolled in a medical monitoring program as required by OSHA, including medical monitoring for blood lead levels as outlined in Section 2.13 of this HASP.
- Ensuring all employees have current fit-test and training certifications.
- Implementing work practices that avoid generating dust whenever possible.
- Requiring that all employees implement decontamination procedures, including washing hands, face, hair and neck upon leaving the work area and before eating, drinking or smoking.
- Removing lead based paint or coatings before cutting, grinding or other activities that would be expected to disturb the lead-based materials, or complying with the provisions of 29 CFR 1926.62.
- Use of the Buddy System will be required for all employees working within the Exclusion Zone, as defined in Section 2.8.1 below, or while performing non-standard tasks as designated by the Subcontractor's Safety Officer.

2.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment will be used to provide adequate personnel protection only after feasible engineering and administrative control options have been exhausted. All personnel engaged in the project work activities will use the appropriate level of protection as required by the activity to be performed and are presented in the "Activity Hazard Analysis" presented in Table 2-1.

All PPE requirements for site activities are based upon available historical site characterization data and knowledge of the anticipated hazards. Changes in levels of PPE and changes in the PPE requirements for specific areas shall be made based upon the results of monitoring, visual observations and the nature of the site operations, including the presence of or potential for previously unidentified chemicals or conditions.

In accordance with OSHA 29 CFR 1910.132-138 and 1926.28 (Personal Protective Equipment), all PPE shall be provided, used, and maintained in a sanitary and reliable condition. All PPE

shall be of construction, design, and material to protect employees against known or anticipated hazards. PPE shall be selected that properly and appropriately fits the employee.

2.5.1 Basic PPE Requirements

Each employee will wear a hard hat and safety glasses or other eye protection at all times while on-site, except for designated "safe" areas. Eye protection includes safety glasses, safety goggles, welding goggles, welding hoods, or full-face respirators. Prescription or non-prescription eyeglasses and sunglasses are not approved for eye protection. All acceptable eye protection must include side shields and must be ANSI-approved.

Unless in designated safe locations, all personnel shall have with them and/or wear the following PPE when entering the site:

- Work clothes without loose sleeves and cuffs
- American National Standards Institute (ANSI) - approved safety boots
- ANSI - approved safety glasses
- ANSI - approved hard hat with bill facing forward
- Work gloves (either leather or cotton)
- Hearing protection (as necessary)

The above listed PPE ensemble, defined as Level D, shall be worn during all outdoor site activities and inside of the building after clearance testing has been completed.

2.5.2 Level C PPE

Level C PPE shall be worn when working inside of the building (with the exception of previously cleaned areas such portions of the basement occupied by field offices) during all Phase I and some Preparation Phase and Phase II activities. Level C PPE consists of:

- Full-face powered air-purifying respirator (PAPR) with HEPA filter approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health

Administration (MSHA)[1]. Half-face air-purifying respirators (APR) may be used during work preparation activities.

- Gloves - nitrile inner; chemical resistant outer (nitrile or neoprene)
- ANSI-approved safety boots
- ANSI–approved Eye protection – safety glasses or goggles
- ANSI-approved Hard hat with bill facing forward
- Tyvek coveralls with head cover (Two layers Tyvek or equivalent)
- Water-resistant overboots which are treaded to provide slip protection
- Hearing protection (as necessary)

2.5.3 Level B PPE

Level B PPE will be required during the exposure assessments when torch cutting of steel with heavy-metal containing coatings and may be required during jack hammering concrete in enclosures during the installation of the cement chute. Level B will be required until an exposure assessment including personal air monitoring confirms that the downgrade of protection is appropriate. Level B PPE consists of:

- Self-Contained Breathing Apparatus (SCBA) or combination airline/SCBA approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA).
- Gloves - nitrile inner; chemical resistant outer (nitrile or neoprene)
- ANSI-approved safety boots
- ANSI–approved Eye protection – safety glasses or goggles
- ANSI-approved Hard hat with bill facing forward
- Tyvek coveralls with head cover (Two layers Tyvek or equivalent)
- Water-resistant overboots which are treaded to provide slip protection

[1] If air sampling data proves that the level of asbestos and COPCs are consistently below the action level, respiratory protection may be downgraded to an appropriate level of protection.

- Hearing protection (as necessary)

2.5.4 Level A PPE

Use of this type of PPE is not anticipated at this site. Should work conditions and personnel sampling exceed action levels for a PPE upgrade to Level A, operations shall cease in that area until site conditions can be re-evaluated by the Contractor NYCSSM and the Environmental Consultant's CIH.

2.6 SAFETY EQUIPMENT

The requirements for PPE on this job may be refined and changed to address the conditions identified when tasks are performed. The Subcontractors will work with the Contractor NYCSSM to ensure the proper PPE is maintained and available on-site at all times, and that personnel are trained to use the PPE and understand the procedures and practices for the safe and effective use of PPE. The Subcontractors will provide the required PPE for their employees.

The PPE requirements presented in this HASP are the minimally acceptable for the specified activity. Subcontractors can make individual decisions to upgrade the equipment requirements for each PPE level to ensure the hazards presented by an activity are controlled and exposure is minimized. Engineering and administrative controls will be identified and implemented for each activity prior to use of PPE.

2.6.1 Respiratory Protection Program

Respiratory protection is required whenever work is performed inside the building to protect the workers from exposures to contaminants, primarily asbestos, that may be present. Half-face negative pressure air purifying respiration particulate filters that are HEPA or P100 shall be required during abatement work preparation activities (i.e. installation of isolation barriers) and exterior work (excluding exterior fireproofing removal). PAPR protection will be used during all interior abatement and exterior fireproofing removal activities, unless Level B is required. Qualified subcontractor IH personnel will evaluate the need for additional protection such as adding organic vapor cartridges based on their respiratory protection programs and chemicals they may be using. The following practices will be conveyed to all employees and

enforced by the Contractor NYCSSM and the HASP AM with respect to respiratory equipment for this project:

- Subcontractors whose personnel may have the need to wear respiratory protection on this job, shall have a written respiratory protection program that meets the requirements of the OSHA Standard (29 CFR 1910.134) and has been developed by a Competent Person as defined by OSHA.

- Personnel who may need to wear respiratory protection shall be fit-testing, medically qualified and trained, as required by the Standard, to use respiratory protection. The Subcontractor shall identify personnel who may use respiratory protection and documentation of fit-testing, medical qualification and training shall be provided for each person who may need to wear respiratory protection on the job.

- The Subcontractor shall review with the Contractor NYCSSM the procedures for the handling, storage and maintenance of respiratory protective equipment to be used on-site, including the process for reporting and repairing or replacing defective equipment and the locations where respiratory equipment will be stored.

- Subcontractors will provide employees with adequate respiratory protection as required by each task.

- A respirator of lesser protection than is required for the task/activity may not be used.

- Each employee will change his/her respirator filter at the end of each work shift. The Subcontractor will provide an adequate supply of approved filters for daily replacement for each employee's respirator.

- Each Subcontractor will ensure the adequacy of respiratory protection for his employees based upon the verified results of personal air sampling.

- If at any time air sampling data indicates airborne exposures exceeding one-half the OSHA Permissible Exposure Limit, all affected employees' respiratory protection will be upgraded.

2.6.1.1 Respirator Testing

Each individual who must wear a respirator will be required to be clean-shaven where the sealing areas of the respirator face piece contacts the face. Each respirator user will be respirator fit-tested in accordance with 29 CFR 1910.134 at least annually. Upon donning the respiratory device or before entering any restricted work area, each respirator wearer will be required to perform a manual negative and positive-pressure test. Subcontractor employees who fail the negative/positive

pressure test because they are not clean shaven will be required to leave site for the day or to shave on-site immediately preceding entry into the work area.

2.6.1.2 Respirator Inspection, Sanitization, and Maintenance

All respirators will be cleaned, sanitized, inspected, assembled, and maintained ready for use on a daily basis. Each respirator will be stored in a clean and sanitary container. Prior to use, the wearer will inspect the respirator, including the valves, valve covers, nosepiece, straps, eyepiece (for full-face respirators), face piece and its snaps, cylinders, and canisters to insure that the respirator can be worn. The Subcontractor will provide initial training concerning the use of respirator equipment, but each employee will be responsible for cleaning, inspecting, maintaining, sanitizing, and storage of his/her respirator equipment.

If a respirator becomes chemically contaminated or malfunctions, the respirator will be replaced by the employer with a clean and sanitized respirator, and the contaminated/defective respirator shall be decontaminated and repaired before reuse, or tagged "out of service" and disposed of. The respirator wearer shall inspect the replacement respirator for defective parts and leaks and will be fit tested if the replacement respirator is of a different make, model or size than the original.

2.6.2 Medical Response Equipment

The following medical response equipment shall be available on-site for the duration of the site activities. The locations of these equipment stations shall be determined at the site and incorporated into this HASP upon initiation of each task. The Contractor NYCSSM shall maintain responsibility for the incorporation of this information into this HASP.

- Eyewash Stations: The location of emergency eyewash stations shall be determined. Each station shall provide a continuous spray of a rate of 0.4 gallons per minute for at least 15 minutes. This station shall be inspected daily to ensure proper operation.
- First Aid Kits: The locations of fixed and/or portable kits shall be determined. As a general guideline, each Subcontractor shall provide, at minimum, one first aid kit for every 20 employees and shall station it within the work area (for Level D operations) or directly outside the decontamination area (contaminant reduction zone) (for Level C or Level B operations).

- Automated External Defibrillator (AED): an AED shall be located within the Contractor's on-site field office.

The locations of eyewashes, first aid kits, AED, and the procedures for using and reporting an incident shall be presented during the initial on-site training. The Contractor NYCSSM shall make all personnel aware of the locations and use of this equipment prior to engaging in site work activities.

2.7 PERSONAL AIR MONITORING

Each Subcontractor and trade employer shall perform personnel air sampling for the following contaminants during Phase I of the project: particulates as TSP, metals as TSP, asbestos, PAHs, D/Fs, PCBs, mercury, lead and silica. Additionally, representative daily personnel sampling for lead, cadmium, chromium and mercury shall be performed during all cutting and torching operations as required by 29 CFR 1926.62(d)(2)(iv) and the Cadmium in construction standard [29 CFR 1926.112] and silica sampling during concrete hammering and removal operations. The results of personnel monitoring will be reviewed on a daily basis by the Subcontractor Safety Officer to determine if current levels of respiratory protection are adequate. The subcontractor safety officer shall provide written documentation of this review to Contractor's NYCSSM and the subcontractor must immediately report any results that trigger PPE upgrades. The following table lists the OSHA PEL, site specific Action Level, and trigger levels:

Table 2-2

Contaminants	OSHA PEL	Action Level (Half value of OSHA PEL)	10 X OSHA PEL (Protection factor for Half-face APR)	100 X OSHA PEL (Protection Factor for Full-face PAPR)
Asbestos	0.1 f/cc	0.05 f/cc	1 f/cc	10 f/cc
Antimony	0.5 mg/m^3	0.25 mg/m^3	5 mg/m^3	50 mg/m^3
Barium	0.5 mg/m^3	0.25 mg/m^3	5 mg/m^3	50 mg/m^3
Beryllium	0.002 mg/m^3	0.001 mg/m^3	0.02 mg/m^3	0.2 mg/m^3
Cadmium	0.005 mg/m^3	0.0025 mg/m^3	0.05 mg/m^3	0.5 mg/m^3
Chromium (III)	0.5 mg/m^3	0.25 mg/m^3	5 mg/m^3	50 mg/m^3
Copper	1 mg/m^3	0.5 mg/m^3	10 mg/m^3	100 mg/m^3

Contaminants	OSHA PEL	Action Level (Half value of OSHA PEL)	10 X OSHA PEL (Protection factor for Half-face APR)	100 X OSHA PEL (Protection Factor for Full-face PAPR)
Lead	0.05 mg/m^3	0.025 mg/m^3	0.5 mg/m^3	5 mg/m^3
Manganese	5 mg/m^3	2.5 mg/m^3	50 mg/m^3	500 mg/m^3
Mercury	0.1 mg/m^3	0.05 mg/m^3	1 mg/m^3	10 mg/m^3
Nickel	1 mg/m^3	0.5 mg/m^3	10 mg/m^3	100 mg/m^3
Zinc	5 mg/m^3	2.5 mg/m^3	50 mg/m^3	500 mg/m^3

2.8 SITE CONTROL

Site control measures shall be implemented to protect the public and personnel working on-site. The aspects of site control shall address:

- General access to the site; and
- Access to the building and site during the deconstruction phase.

Fences, guardrails and access devices, including ladders, stairways, and walking surfaces shall be provided and maintained throughout the project activities in accordance with 29 CFR 1926. In addition, barricades, warning signs and devices, temporary lighting and other safety measures shall be provided, as required, to protect site personnel.

All visitors to the site shall report first to the Contractor field office. Visitor access shall be limited to the Support Zone and Level D operation areas only, and shall be allowed only with the prior consent of the Contractor NYCSSM and the Contractor Site Manager. No visitor shall enter a work area unescorted by a Subcontractor or Contractor representative. The presence of any regulatory agency on-site shall be reported immediately to the Contractor Site Manager.

2.8.1 Work Zones

For Preparation Phase, Phase I and Phase II Abatement activities, entry into the work zones begins once a person comes on-site. This approach reflects the dynamic nature of the operations and the need for everyone to be aware of the conditions while on-site. Using the concept of three zones for the site, the following areas are identified on each individual floor:

- Support Zone – This area starts at the project/property fence line and extends to the entry to where personnel enter the building to complete the work tasks. This area includes the ground outside of the building and any office spaces. In this area all personnel shall wear Level D PPE. Within this area exclusion zones may be established depending on the operations, for example: where material handling is performed, where hoisting equipment is located or where equipment is staged.

- Contamination Reduction Zone (CRZ) – Subject to approval of the variance, this area shall be located attached to the exclusion zone or at the pre-existing Personnel and Waste Decontamination Facilities located in Cellar "A" and the 1st floor will be utilized for the duration of this project.

  Personnel shall be aware of and follow all site control procedures with respect to entering and exiting the CRZ, to ensure that they are not exposed to contaminants and to minimize the potential for contamination of personnel and the spread of contamination outside the Exclusion Zone (EZ). These measures include having personnel follow the proper procedures for donning and doffing PPE and washing in the CRZ. The measures also address the decontamination procedures for use when moving equipment between zones.

  The CRZ shall consist of an area to drop off equipment, plastic bags to dispose of protective clothing, adequate soap and water for personnel and equipment decontamination and a means of capturing wash water generated during decontamination. The CRZ shall also have a first-aid kit, fire blanket and fire extinguisher (20-lb ABC-type).

- Exclusion Zone (EZ) – This area extends from the side of the CRZ facing the building and includes all areas on each floor of the building. This definition of the EZ shall remain effective until Phase I activity on each floor is completed. No employee shall enter the Exclusion Zone without the required training and PPE. No employee shall eat, drink, chew gum, apply cosmetics, smoke or use other tobacco products while in the Exclusion Zone. The employee must first exit the Exclusion Zone and follow decontamination procedures (Section 2.8.2.1) in the CRZ before engaging in any of the above actions. In the event that an employee in the EZ requires a replacement or his/her protective suit or respirator filters, the employee shall exit the EZ and utilize proper decontamination procedures in the CRZ, replace or repair the defective PPE, then re-enter the EZ.

2.8.2 Personnel and Equipment Decontamination

When exiting the EZ, personnel shall be aware of and follow the procedures used to decontaminate personnel, equipment, and sampling containers. Subcontractors shall ensure that their employees follow proper decontamination and waste disposal procedures. Disposal of PPE and other items shall be performed in accordance with Section 3 of this HASP, with material

placed in appropriately sized and labeled containers. Specific decontamination procedures are presented in the following subsections.

2.8.2.1 Personnel Decontamination Procedure

Personnel entering containment are required to follow proper decontamination procedures. All employees who leave the Exclusion Zone shall follow the decontamination process as outlined below.

All employees shall remove all gross contamination and debris from disposal protective clothing and equipment by vacuuming prior to leaving the EZ. All employees must be HEPA vacuumed before entering the elevator that leads to the CRZ. Upon entering the CRZ, each employee shall remove the first layer of protective clothing and place it in the appropriate container. If the employee performs duties and becomes "grossly contaminated", the decontamination procedure will include an Alconox (soapy) wash and a tap water rinse of the outer suit, gloves and overboots prior to removal of the outer layer.

After employees remove the first layer of tyvek and gloves, they shall then move into a second decon area where the second tyvek and gloves shall be removed and placed in the appropriate waste container. After this decontamination, personnel shall proceed to a washing facility to take full showers. The employee shall dispose of all protective clothing upon exiting the decontamination unit; all half-face APR respirator cartridges, if used, shall be changed out, as needed, but on a daily basis at a minimum. Full-face PAPR cartridges may be utilized more than one day if functioning as designed and sealed and decontaminated after each use.

2.8.2.2 Equipment Decontamination Procedure

Since equipment decontamination is difficult, unnecessary equipment shall not be brought into the controlled areas. All materials used in the regulated area shall be properly HEPA vacuumed and wet-wiped before leaving the first decontamination zone. All equipment that becomes "grossly contaminated", will require an Alconox wash and tap rinse.

2.8.3 Safety Meetings

A safety meeting shall be held each day with the Contractor and each Subcontractor prior to initiating the scheduled activities and at the beginning of each day. The topics and content for the Safety Meeting shall be prepared in advance by the subcontractors and submitted to the Contractor NYCSSM for approval. The safety meeting shall review elements in the site HASP and the procedures for working on-site, and address the impacts of changes to the site conditions. Topics to be addressed include:

- Use and maintenance of PPE
- Evacuation routes;
- Warning signals;
- Maintaining line-of-sight and communications;
- Rehearsal of scheduled activities;
- Hospital routes;
- Locations of safety equipment;
- Previous violations of the safety plan and procedures or changes to the program to correct the violation;
- Anticipated hazards for the day's work activities;
- Any changes to the requirements for levels of PPE;
- The locations of work zones; and
- General site conditions.

All safety meetings shall be documented in the site H&S logbook. Meeting participants shall sign an attendance sheet.

2.9 TRAINING PLAN

All personnel directly involved in the project site activities shall be trained for the tasks they will perform, as required by applicable federal/state/local regulations. Refresher training will be performed at least yearly. In addition, all site personnel shall participate in site-specific training and

participation of personnel in training shall be documented, with proof of training maintained on-site. The topics of training required are dependent on the SOW. This training shall be administrated by the Contractor, the Subcontractor, or certified training facilities.

2.9.1 Health and Safety Awareness Training

Each Subcontractor shall be responsible for presenting and discussing the elements of this HASP with their personnel and subcontractors, and ensuring that personnel follow the elements of this HASP when working on-site. Prior to the start of work activities, or whenever a new hazard is introduced into the work area, employees shall be provided with the information indicated below. The Contractor NYCSSM or HASP AM shall be available to address any questions or assist in the presentation of the HASP information to project employees. Information to be addressed during this training shall include, but not be limited to:

- Hazardous chemicals present at the work site and their associated health risks.
- Potential physical hazards associated with the work activities, and proper safe working practices.
- Proper use of all tools and equipment to complete the scope of work activities.
- Requirements of the site Hazard Communication Program, including the labeling of containers.
- Site alarm system, emergency response procedures, and location of emergency lay down area.
- Proper PPE to be used during work activities.
- Location of the MSDS files.
- How to reduce or prevent exposure to hazardous chemicals through the use of controls procedures, work practices, and personal protective equipment.

2.9.2 Asbestos Training

ACBM was determined to be in several building components per the Berger "Initial Building Characterization Study Report" and as verified by TRC. Personnel entering containment shall be trained to identify ACBM and the hazards associated with asbestos in accordance with the OSHA Asbestos Standards (29 CFR 1910.1001 and 29 CFR 1926.1101) and state/local certification

requirements. This training provides personnel with a better understanding of asbestos and the steps to be taken to protect themselves and the public. In areas that ACBM was identified, required NYSDOL and NYCDEP procedures shall be followed.

2.9.3 HAZWOPER Training

Personnel entering the exclusion or contamination zones for the purpose of performing cleanup-abatement activities must have received the required 40 hour training as outlined by 29 CFR 1910.120(a) (i) and appropriate annual refresher training as required. This HAZWOPER training requirement may be removed, should sampling indicate training requirement downgrade is appropriate.

2.10 PERSONAL PROTECTIVE EQUIPMENT TRAINING

Each Subcontractor shall provide training concerning the use of PPE to their personnel, as specified by this plan, to address the general PPE requirements and any specific requirements for PPE they may use, such as fall protection. The Contractor NYCSSM or HASP AM can assist with this training, and any concerns regarding the use of appropriate PPE shall be brought the attention of the Contractor NYCSSM. Further discussion of the types of PPE is presented in Subsection 2.5 of this HASP.

2.10.1 Emergency Response Training

Emergency response training, in accordance with the Emergency Action Plan found within Section 3 of the Deconstruction Plan, shall be provided to all on-site-personnel as part of the site-specific safety and health awareness training. The emergency response training shall be conducted by each Subcontractor's Safety Officer for his/her respective employees. At a minimum, the topics of this training shall include the following:

- Location of all site emergency equipment
- Response procedures for fires
- Response procedures for injuries and accidents
- On-site/off-site response resources

- Emergency site operations shut down procedures
- On-site "Chain of Command"
- Designated on-site emergency meeting location
- Recognition of evacuation signals and alarms

2.10.2 Visitor Training

Site visitors are defined as persons who are not employed at the project site, who do not routinely enter restricted work areas, or whose presence is of short duration (i.e., one to two days per month). During Phase I, all visitors entering the EZ must provide proof of an up-to-date fit-testing and medical clearance, and completion asbestos certifications required for the employee's scope of work. In addition each visitor will receive site-specific training by the Contractor NYCSSM or HASP AM that includes:

- Location and description of potential hazards and risks
- Required PPE
- Areas of the site that may be closed to visitors
- The site evacuation plan and emergency procedures
- Other topics as deemed appropriate by the Contractor NYCSSM

2.10.3 Other OSHA Specific Standard Training

Because of lead and cadmium being identified as COPCs and the potential for lead fumes or dust to be produced in deconstruction from building materials, subcontractors will provide proof of training required in OSHA Specific Standards 29 CFR1926.65 (Lead in Construction) and 1926.1127 (Cadmium)

2.11 HAZARD COMMUNICATION

The Contractor and Subcontractors shall notify the Contractor NYCSSM of any hazardous products prior to bringing the chemical on site and shall provide a MSDS for each product. These MSDSs shall be maintained by the Contractor NYCSSM and shall be kept in a site master

file. In addition, each Subcontractor shall maintain a copy of the MSDS for each product that they bring on-site.

The Subcontractor shall review with the Contractor NYCSSM the procedures for handling, using and storing the chemicals brought on-site, and shall review with their personnel the proper procedures for handling, using and storing the chemicals before the product is used on-site. This includes but is not limited to all commercial products brought on-site by Subcontractors, including commercial cleansers, degreasers, lubricants and paints.

2.11.1 Container Labels

All containers of hazardous materials shall be labeled in accordance with appropriate standards. The labels on containers provided by the manufacturer, importer, or distributor shall be used. Labels affixed to containers of hazardous materials shall:

- Identify the material using a name with which workers are familiar.
- Identify the hazards associated with the material, including toxicity information that indicates symptoms and target organs.
- Identify the name, address, and telephone number of the manufacturer, importer, or distributor where more information may be obtained.

Labels shall not conflict with Hazardous Materials Transportation Act (HMTA) labeling requirements and shall meet the requirements of OSHA substance-specific health standards, where required.

Labels are not required on portable containers filled from a correctly labeled container if the worker uses the material from that container only during that work shift. However, the subcontractor shall prepare a container label when the contents of the container are not used on the shift during which the container was filled and when the container label is defaced or illegible. The prepared temporary label shall indicate pertinent chemical identification and health information as required by OSHA.

2.11.2 Material Safety Data Sheets (MSDSs)

All MSDSs shall be submitted by the Subcontractors and shall be maintained by the Contractor NYCSSM within a site master file. In addition, each Subcontractor shall maintain a copy of the MSDS for each product that they bring on-site. In addition, each Subcontractor shall also retain a log of MSDSs for chemicals used on this project and this log shall be kept on-site. The location of the MSDS folder shall be made known to all project employees.

Each Subcontractor shall review incoming MSDSs for new or significant health and safety information and shall ensure that any new information is communicated to affected employees, the Contractor NYCSSM and other subcontractors. If an MSDS is not received at the time of initial shipment of materials, the material may not be used until the MSDS has been obtained from the manufacturer.

Employees shall be instructed to notify their Site Manager if an MSDS is not available. When a revised MSDS is received, the Site Manager shall immediately replace the old MSDS. Subcontractors shall insure that the MSDSs on file for their chemicals are current (updated within last two years).

2.12 ACCIDENT PREVENTION & INVESTIGATION

A vital element of maintaining safe work practices is accident prevention. The following four actions are instrumental to accident prevention, and shall be communicated to all project personnel:

- Eliminate unsafe conditions. Efforts shall be initiated and implemented throughout the project to identify conditions that can contribute to an accident, and to remove exposure to these conditions. Each Subcontractor Safety Officer shall audit the work area prior to each shift to identify and correct any unsafe conditions.

- Reduce unsafe acts. Personnel shall make a conscious effort to work safely. A high degree of safety awareness shall be maintained so that safety factors are an integral part of each task. Daily safety briefings shall be designed to heighten general safety awareness and will be tailored to the individual audiences and tasks each day.

- Inspect frequently. Regular safety inspections of the work site, material, equipment, and operations by qualified persons (i.e., Contractor NYCSSM) shall be performed to ensure

early detection of unsafe conditions. Safety and health deficiencies shall be corrected as soon as possible, or site activities shall be suspended. All inspections shall be documented and the records retained by the Subcontractor for, at a minimum, the duration of the project. Copies of the inspection reports shall be provided to the Contractor NYCSSM or Contractor Project Manager upon request,

- Educate personnel concerning the requirements of the HASP. The HASP and all site health and safety education shall be provided by each Subcontractor, the Contractor NYCSSM and HASP AM.

All minor accidents (i.e., small fires, injuries, and near misses) shall be investigated by the Subcontractor Site Manager or Safety Officer and communicated to the Contractor NYCSSM immediately when reported to the Subcontractor. The Contractor should also be contacted as soon as possible. An accident investigation shall include reviewing the accident/incident report, questioning the injured employee(s) as well as other personnel witnessing the occurrence, identifying all contributing acts and conditions, determining underlying reasons for their existence or occurrence, and implementing corrective actions. A report documenting the investigation shall be written and forwarded by the Subcontractor to the Contractor NYCSSM and the Contractor Project Manager. Recommendations for accident prevention shall also be made in the report and communicated to all site personnel during periodic safety briefings and training sessions.

2.13 MEDICAL SURVEILLANCE PLAN

All persons involved shall be enrolled in an HAZWOPER and/or asbestos medical monitoring program, as appropriate, prior to working on-site. This requirement ensures that personnel are protected from asbestos and other COPCs that have been identified. In the event that air sampling confirms the presence of air-borne asbestos and workers are exposed to asbestos levels above the OSHA PEL, then guidance concerning the requirements for annual medical examinations shall be provided by the Contractor NYCSSM.

The "Initial Building Characterization Study Report", dated September 14, 2004, and published by The Louis Berger Group, Inc. shows elevated levels of lead; therefore, all employees shall also take part in biological monitoring for lead in accordance with 29 CFR 1926.62. This includes baseline blood work within 48 hours of the start of exposure and every 2 months for the first 6

months of exposures over the action level for more than 30 days per year. After the first 6 months, the blood levels should be checked every 6 months. This shall insure that the levels of respiratory protection used by employees properly protect them from lead exposure.

In addition, medical monitoring will be conducted for any COPCs that have an OSHA standard.

2.13.1 Respiratory Protection

All personnel having to wear a respirator must have a medical evaluation as required by 29 CFR 1910.134 to determine fitness to use respiratory protective equipment prior to initiation of work activities. Documentation indicating medical clearance for respirator use must be provided to the HASP AM by each Subcontractor prior to entrance into the work area, should respirator use be required by that employee. Each Subcontractor shall maintain a written Respiratory Protection Program developed by a Competent Person as required by 29 CFR 1926.103.

2.13.2 Hearing Conservation

All personnel exposed to noise levels above 85 dBA must have a baseline audiometric evaluation in accordance with 29 CFR 1926.52 and 101. Personnel shall receive awareness training concerning the hazards of noise and the procedures to properly use and maintain hearing protection. If any Subcontractor exposes his employees the noise levels above 85 dBA, the Subcontractor must establish a written Hearing Conservation Program developed by a competent person as required by 29 CFR 1926.101 and 29 CFR 1910.95

2.13.3 First Aid

On-site First Aid/CPR/AED support shall be provided by the Contractor NYCSSM. Additionally, each Subcontractor shall have on-site at least one person who has current training in first aid, CPR, and AED use.

2.13.4 Medical Emergency and Personal Injury

The first worker who notices that a medical emergency or personal injury has occurred shall immediately make a subjective decision as to whether the emergency is life threatening and/or otherwise serious.

Life-Threatening and/or Otherwise Serious Incident

If a life-threatening incident occurs, those persons recognizing the situation should do whatever actions in their capabilities to reduce the threat and then the Contractor NYCSSM shall be contacted. The Contractor NYCSSM shall immediately notify the Emergency Medical Services (EMS) and implement emergency action procedures to have someone meet and guide EMS to the incident location. The Contractor shall be notified of the incident as early as possible.

The Contractor NYCSSM shall be kept apprised of the situation and the location of the victim(s). As the Contractor NYCSSM proceeds to the accident scene, communications channels shall be opened and kept on standby until the Contractor NYCSSM has surveyed the scene and performed a primary survey of the victim.

The Contractor NYCSSM shall provide emergency action guidance consistent with the injury and shall relay the appropriate information to the site person meeting the EMS.

Depending on the nature of the injury and the location at which the injury occurred, the Contractor NYCSSM shall determine whether the person can be moved or whether the EMS team will need to come into the work area to assist the victim. Should the victim be injured in the Exclusion Zone, all appropriate life-saving methods shall be exercised in that area before attempting decontamination of the victim. The extent of emergency decontamination performed shall depend on the severity of the injury or illness and the nature of the contamination. If the emergency is such that emergency decontamination cannot be performed safely, the victim shall be given necessary first-aid treatment and wrapped in a blanket prior to transportation by EMS. If heat stress is a factor in a victim's injury/illness, all protective clothing shall be removed from the victim immediately.

Non-Life-Threatening Incident

Should it be determined that no threat to life is present, a co-worker will assist the injured person and contact the Contractor NYCSSM as soon as reasonably possible. Should the victim be injured in the Exclusion Zone, a rapid decontamination consisting of Tyvek, glove and respirator removal shall be performed in the Contamination Reduction Zone prior to initiation of medical

assistance. For all non-life-threatening injuries, all medical assistance shall be provided in the Support Zone to reduce the spread of contamination to medical personnel or equipment.

2.13.5 Bloodborne Pathogens

When an emergency occurs that involves the potential for contact with bodily fluids, personnel shall use procedures and PPE that minimize the potential for exposure.

All personnel who provided direct support to an injured person shall participate in a post-incident exposure review during which their role in the event and the potential for contact with bodily fluids shall be evaluated. The information relating to exposure shall be documented for each individual. The procedures for the post-exposure consultation identified in the OSHA Bloodborne Pathogens Standard (29 CFR 1910.1030) shall be followed.

All personnel on-site shall receive awareness training concerning Bloodborne Pathogens (BBP) and the procedures to be followed to respond to emergencies that occur on-site. This awareness training shall be provided by each Subcontractor prior to the initiation of work activities and when new employees are introduced to the Site. In addition, each Subcontractor must have a BBP plan.

3.0 DOCUMENTATION

Each Subcontractor shall maintain documentation, as established by the Contractor, which shall record, at a minimum, the following information:

- The Subcontractor employees on Site, including arrival and departure times and their destination at the Site.
- Information required to be maintained by the OSHA respiratory protection standard, including medical clearance documents, training and certification records, fit-test records, and the results of personal air monitoring used to determine employee exposures. Additionally, all medical and sampling documentation required by OSHA's Lead in Construction standard must be maintained.
- Area air testing results

- Incidents and unusual activities that occur at the Site, including but not limited to injuries, illnesses, accidents, spills, breaches of security, equipment failures, weather-related problems and near-misses.

- Records of daily safety briefings, including attendance documentation for all employees required to attend.

- Records of health and safety inspections by governmental agencies.

- Records of corrective actions performed in response to any deficiencies noted through government agency inspection or by the Contractor NYCSSM.

ATTACHMENT 1

130 Liberty Street

Organization Chart