SECTION 02080

ASBESTOS AND COPC ABATEMENT AND REMOVAL SPECIFICATION

TABLE OF CONTENTS

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PART 1 - GENERAL

The Lower Manhattan Development Corporation ("LMDC") plans to clean and abate the building located at 130 Liberty Street in the City of New York (the "Building") pursuant to this Asbestos and COPC Abatement and Removal Specification ("Specification").[1] This Specification applies to Phases I and II of the Deconstruction. It is intended to detail the requirements for the Asbestos and COPC abatement required to complete the overall Deconstruction Plan for 130 Liberty Street (See Addendum 1) in a manner consistent with all Legal Requirements including those Variances granted by the New York State Department of Labor (NYSDOL) for asbestos abatement (see Attachments 3, 4, 5 and 6).

The Deconstruction Plan 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

This Specification includes activities associated with Phase I and Phase II only. Coordination with Scaffold Contractor implementing the Preparation Phase of the work is required. The Preparation Phase includes the erection of scaffolding, hoist, and sidewalk sheds and the removal of existing netting exterior of the Building as detailed in the Scaffold Contract.

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 (See Attachments 1 and 2).

This Specification is intended to present the minimum requirements to appropriately address the ACM[2] and COPCs identified in prior studies on both the interior and exterior of the Building. It

[1] All capitalized defined terms used herein but not defined herein are defined in the General Conditions or other Contract Documents.

[2] "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 (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 solid items impacted by asbestos if and only if said non-porous solid 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). Governmental Authorities have stated (and such statements are deemed a Legal Requirement for purposes of this Contract) 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.

shall be the Contractor's responsibility to implement the work in a manner consistent with all Legal Requirements. The Contractor shall remove and dispose of all contaminants in a safe and controlled manner in order to (i) prevent exposure of workers and the public to asbestos fibers and other COPCs, (ii) safeguard workers and the public from construction debris, and (iii) maintain a safe working and neighborhood environment throughout the cleaning and deconstruction process. In furtherance of these objectives and in accordance with Legal Requirements, all interior cleaning and removal shall be conducted under containment and negative pressure which shall 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 shall be handled, packaged, transported, and disposed of, at a minimum, as asbestos waste in properly permitted facilities.

The measures set forth herein are minimum requirements and in no way relieve the Contractor of its responsibility to perform the Work in a manner consistent with all Legal Requirements. If more stringent handling, packaging, transportation, disposal or other Work requirements are imposed by Legal Requirements, the most stringent requirements shall be followed.

1.1 BACKGROUND

A. 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.

B. Subsequent to September 11, 2001, operations were undertaken by the then-owner Deutsche Bank to clear certain debris from portions of 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, certain office furniture, some equipment, and certain other non-attached items in the Building were removed. Contractor shall carefully inspect the Building to determine what materials remain.

C. LMDC, the current owner of the Building, through this Contract 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.

D. This Specification 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 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).

E. An Asbestos and COPCs Abatement and Removal Plan for the Preparation Phase and Phases I and II ("Abatement and Removal Plan"), was prepared in accordance with the Variances, has been submitted to the federal, state, and city regulatory agencies due to the presence of asbestos and other COPCs in the Building. Contractor must comply with, and accordingly must carefully review, the Abatement and Removal Plan and the Variances. 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. LMDC, requires the Contractor to (i) conduct the abatement work in a protective and expeditious manner in full compliance with Legal Requirements, thereby protecting workers and the public and (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.

F. This Specification 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 during deconstruction of the Building, both inside and outside the Building and in the vicinity of 130 Liberty, and during shipment and ultimate disposal of the deconstruction debris and wastes. At the same time, it 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] 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.

1.2 BUILDING DESCRIPTION

A. 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).

B. 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 each floor within the concrete slabs that comprise the floor. The cell system facilitated running 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.

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

D. 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').

E. 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. LMDC makes no representations or warranties concerning the reliability or operability of any such systems or components.

1.3 DESCRIPTION OF WORK

The Deconstruction Plan 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

This Specification includes activities associated with Phase I and Phase II only. Coordination

with Scaffold Contractor implementing the Preparation Phase of the work is required. The Preparation Phase includes the erection of scaffolding, a hoist and sidewalk sheds, and the removal of existing netting exterior of the Building as detailed in the Scaffold Contract.

Phase I of the Deconstruction Project shall occur while the work area is placed under negative pressure containment and includes, but is not limited to, the removal and disposal of all interior non-structural items from the Building. The entire interior of the Building, with the exception of certain shafts and non-porous mechanical equipment and shafts, shall be removed under Phase I. All materials shall be treated as asbestos, at a minimum and therefore shall be appropriately managed, handled, packaged, transported and disposed by the Contractor. Phase I work includes but is not limited to the following general categories: (a) the general area cleanup of WTC dust and debris, (b) removal and disposal of all 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 and disposal 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 and disposal of asbestos and other regulated waste including, but not limited to light bulbs, lighting ballasts and potting material, batteries, mercury-containing thermostats, etc. at generation points, movement of containers to the decontamination unit and movement of decontaminated containers to waste loading or repackaging areas.

The Phase I Asbestos and COPC Abatement and Removal shall be conducted so that the Building can be safely deconstructed in Phase II of the Deconstruction Project in compliance with Legal Requirements to allow for redevelopment of the WTC site.

Phase II shall include, but not be limited to, the cleaning of exterior surfaces of the Building (i.e. building washdown), removal of exterior ACBM, 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. Phase II Abatement and removal activities shall include but not be limited to 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.

Contractor shall:

A. Remove and dispose of all Hazardous Materials, COPCs, and ACM listed in the attached reports from Berger and TRC (Attachments 1 and 2), or otherwise on or in the Building, as asbestos material, at a minimum and pursuant to any other Legal Requirements. Quantities in the referenced attachments from Berger and TRC are approximate only and Contractor assumes all risk in quantity and location variations. ACM shall be removed within a negative pressure enclosure system and as specified in this Specification.

B. Remove and dispose of all porous items constituting, in and/or on the Building, including but not limited to carpeting, ceiling tiles, fireproofing, sheetrock, core-board, etc. that shall be treated as asbestos at a minimum.

C. Remove and dispose of all porous and non-porous items that shall be treated as asbestos at a minimum and shall include, but is not be limited to, those encountered in:

a. All Building spaces including but not limited to all Building interior spaces, mechanical spaces, interstitial spaces, spaces above ceiling tiles, cavities, shafts, stairwells, walker ducts and raceways, roof, cellar levels, former vaults, lobbies, etc.
b. All porous building components and systems including sheetrock, fireproofing, carpeting, ceiling tiles, core-board shafts, furnishings, etc.
c. All HVAC, electrical, communication, mechanical, plumbing, curtain wall, structural systems and components, etc. unless they can be completely cleaned, as specified herein, on all surfaces, both on the Building interior and exterior.

D. Properly handle, package, and transport all asbestos waste, including all porous items and non-porous items that have not been decontaminated in and on the Building for disposal in an asbestos-only landfill (unless waste management sampling or other Legal Requirements indicate that additional requirements apply).

E. Prepare a Site-Specific Implementation planto be revised in accordance with comments from Owner, Federal, State and Local agencies including US Environmental Protection Agency (USEPA), New York State Department of labor (NYSDOL), New York State Department of Environmental Conservation (NYSDEC), New York City Department of Environmental Protection (NYCDEP), New York City Department of Buildings (NYCDOB), and other involved reviewing agency regulators. The Implementation planshall describe in detail all the methods and procedures Contractor intends to use in performing the work such as phasing, staging, material handling and transportation, safety procedures, ventilation, air monitoring, equipment, and any other item requested by reviewing agencies. The Standard Operating Procedures (described elsewhere in this Spec Section) and Detailed Plan of Action (described in this Spec Section under Pre-Construction Submittals) shall be part of this Work Plan. Note the Contractor shall utilize the current LMDC Asbestos and COPCs Abatement and Removal Plan for the Preparation Phase and Phases I and II as a basis for developing his/her own Work Plan.

F. Utilize and abide by owner-submitted NYSDOL Variance Petitions and associated Decisions and Re-openings (Attachment 3), at a minimum. Current Variance Petitions, Decisions and Re-openings include:

- Phase I - Variance Decision File No. 05-0427 dated May 11, 2005
- Phase I - Variance Decision Amendment re: TRC submission dated June 1, 2005

- Phase I - Variance Reopening (2) dated June 10, 2005
- Phase II - Variance Petition dated June 10, 2005

All granted Variances and/or Variance decisions shall become part of this specification section and compliance therewith is required. The most stringent requirements between this specification and all Variances shall apply. In the event of any conflict in the requirements imposed by the Contract Documents and/or by any Legal Requirements, Contractor promptly shall notify LMDC of the conflict and LMDC shall determine, in its sole and exclusive discretion, which requirements are most stringent and Contractor shall comply with LMDC's determination.

1.4 SCOPE OF WORK

A. Contractor shall provide all labor, materials, equipment, services, testing, appurtenances, permits and agreements necessary to perform the work required for the abatement and removal of all ACM including ACBM, and COPCs as required by these Contract Documents. Note all porous materials; and all non-porous items that have not been decontaminated in and on the Building must be treated as asbestos, at a minimum. All work shall be performed in accordance with this Specification, USEPA regulations, OSHA regulations, New York State Industrial Code Rule 56, New York City Local Law 70, Title 15, Chapter 1 RCNY, NIOSH recommendations, and any other applicable federal, state or local government regulations including but not limited granted Variances thereunder. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. LMDC shall determine, in its sole and exclusive discretion, which requirements are most stringent and Contractor shall comply with LMDC's determination.

B. Contractor is responsible for the following:

a. Abatement, removal and disposal of all Hazardous Materials, asbestos (including all porous and certain non-porous items), COPCs, ACM and ACBM constituting in, and/or on the Building.

b. Cleaning and decontamination of the entire Building in accordance with all Legal Requirements..

c. Provide all scaffolding (internal), platform installation, equipment, tools, transportation and any other equipment required and/or necessary to complete all work described in the Contract Documents.

d. The Contractor shall be responsible for and shall include in its Bid any and all fees or changes imposed by Legal Requirements applicable to the work specified herein, including fees or charges which may be imposed subsequent to the date of the Bid opening.

C. The drawings are only a diagrammatic representation of the Work Areas and do not constitute the actual quantities of material. Contractor is responsible for the confirmation of the actual total quantities of the Work to be performed prior to Bidding.

D. It is the Contractor's responsibility to ensure that all work including successful air clearance testing and analysis, as required, is completed prior to the return of any area to other trades or contractors.

F. Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of Hazardous Materials to air, soil, or surface water which could threaten human health or the environment.

G. Contractor shall be solely responsible for and shall hold the City of New York, LMDC, and URS harmless from, any and all damages, losses and expenses resulting from any infringement by Contractor of any patent, including but not limited to the patents described above, used by Contractor during performance of this agreement.

H. The Contractor is responsible for preparing and submitting all filings, notifications, and all associated fees, etc. required by all City, State and Federal regulatory agencies.

I. All temporary lighting and temporary electrical services for use in the Work Area shall be in weather proof enclosures and be ground fault protected.

J. Wastes generated by Contractor as the result of the use of chemicals shall be managed in compliance with all Legal Requirements, including RCRA requirements for waste determination, storage, transportation and disposal..

1.5 PHASING OF WORK

This Specification covers the activities to be undertaken during the Deconstruction Project, which shall occur in the following three phases:

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

This Specification includes activities associated with Phase I and Phase II only. Preparation Phase shall be performed under a separate Scaffold Contract.

A. The proposed cleanup and abatement shall be conducted so that the Building can be safely deconstructed to allow for redevelopment of the WTC Site. This project entails:

a. 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.

b. Removal and disposal of all 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.

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

d. Removal of ACBM from the Building's interior and exterior.

B. During the cleanup and abatement, a minimum buffer zone of two floors, as previously required by NYSDOL, shall be maintained between the active abatement and removal (Phase I) area and the structural demolition (Phase II) portion of the project.[3]

C. Contractor shall comply with applicable Law throughout the cleaning and deconstruction of the Building. Contractor shall conduct the proposed cleanup and abatement in a manner which (i) shall not expose the general public to asbestos and other COPCs, (ii) shall minimize worker exposure to asbestos and other COPCs through the use of appropriate controls and personal protective equipment, (iii) shall minimize adverse impacts of the project on the adjacent community, (iv) shall address the practical operational opportunities and challenges presented by the Building and the Building conditions, and (v) shall prepare the Building for, and safely and effectively complete during Phase II, exterior cleaning, abatement and deconstruction.

D. NYSDOL and other regulatory agencies have stated that the interior of the entire structure is contaminated with asbestos and COPCs. The initial phase of deconstruction (Phase I) includes the necessary interior, non-structural deconstruction and related work. The entire interior of the Building**,** with the exception of certain non-porous mechanical equipment and shafts, shall be removed under Phase I.

E. The sequence of work during Phase I shall include the following: work area preparation including the installation of High Efficiency Particulate Air ("HEPA") ventilation equipment, installation of isolation barriers; pre-cleaning; establishment of waste and personal decontamination systems; establishment of

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

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.

F. 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.

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

H. Except as required for the erection of the required man-hoists, crane and scaffolding, Phase II structural deconstruction activities shall not commence until 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 shall 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.

I. All Phase I activities shall be conducted by a NYSDOL licensed Asbestos Abatement Contractor under controlled conditions and all resultant debris shall 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 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.

J. All mold and bacteriological contamination identified during the LMDC Studies shall be addressed concurrently with abatement activities. Since all porous building materials as well as any mold and/or bacteriological contaminated materials shall be handled, at a minimum, as asbestos waste, no additional special handling requirements are necessary to address mold and bacteriological

contamination. Health and safety protocols regarding the handling of these materials are addressed in Section 5 (Health and Safety Plan) of the Deconstruction Plan.

K. Phase II activities shall include, but not be limited to the cleaning of the Building's exterior (i.e. building washdown) 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.

1.6 SPECIAL REQUIREMENTS

A. The following special experience requirements shall be submitted by Contractor performing asbestos abatement along with its bid application to ensure that the work in this Contract shall be performed by persons knowledgeable, qualified and trained, as specified herein.

1. The Contractor performing the asbestos work specified within this Section must have been in the business of performing asbestos abatement work for a period of three years prior to the bid opening. During that three-year period, the asbestos contractor must, as a prime contractor or a subcontractor, have successfully completed in a timely fashion at least five projects similar in scope and type to the required work (i.e., asbestos abatement projects of this magnitude using the techniques specified in this contract).

2. For each project submitted to meet the requirements set forth in Item 1 above, the Contractor must complete the Qualification Form set forth in the Bid Booklet, specifically indicating the following information.

   a. Name of Contractor

   b. Name and location of the project

   c. Name, title and telephone number of the owner or owner's representative who is familiar with the Bidder's work on the project

   d. Brief description of the work completed

   e. Indicated whether the work was performed as a prime or subcontractor

   f. Amount of the contract or subcontract

   g. Date of completion

B. Asbestos Abatement License: Contractor or Subcontractor performing the work of this section must, for the past three years, have been licensed for asbestos abatement work by the New York State Department of Labor. Contractor must submit a copy of such valid asbestos abatement licenses.

C. Compliance with Experience Requirements: Contractor is advised that no Subcontractor shall be approved for the performance of asbestos abatement work hereunder unless it demonstrates compliance with the experience requirements set forth above. Compliance with such experience requirements shall be determined solely by the Owner.

D. In the event that the bid submission is a joint venture, at least one firm in the joint venture must meet the above described experience requirements.

E. Throughout the specifications, reference is made to codes and standards which establish qualities and types of workmanship and materials, and which establish methods for testing and reporting on the pertinent characteristics thereof. Provide materials or workmanship that meet or exceed the specifically named codes or standards where required by these specifications.

F. Site Investigation: Contractor shall inspect all the specifications and related drawings, and shall investigate and confirm the site conditions affecting the work, including but not limited to:

1. Physical considerations and conditions of both the material and structure. These considerations include any obstacles or obstructions encountered in accessing or removing the material.

2. Handling, storage, transportation and disposal of the material.

3. Availability of qualified and skilled labor.

4. Availability of utilities.

5. Exact quantities and locations of all **materials** (including Hazardous Materials) to be disturbed and/or removed.

1.7 WORK BY OTHERS

A. The Owner reserves the right during the term of this Contract to have work performed on asbestos abatement or other type work by other contractors. The Contractor is to cooperate and coordinate with these other contractors.

B. Contractor shall cooperate and coordinate with the Scaffold Contractor who shall implement the Preparation Phase of the project.

1.8 HEALTH AND SAFETY

A. Toxic Effects: The Contractor shall assume all responsibility for any toxic effects or other harm to workers or others from or as a result of any and all Hazardous Materials, the air supplied to respirators, or from toxic or damaging vapors or residues resulting from the Work, including the use of encapsulant and/or wetting agents or other substances used by the Contractor or others during Deconstruction.

B. Chemical/Biological Hazards: The known chemical/biological hazards on site include Hazardous Materials, ACM, COPCs and debris and as identified in the HASP Section of the Deconstruction Plan. The Contractor shall provide materials, equipment and training to its workers to ensure their protection from these and any other chemical/biological hazards which may be identified during the course of this work.

C. Physical Hazards: The Contractor shall provide safety equipment and training to its workers to ensure their protection from any physical hazards including but not limited to trip/fall hazards, working at elevation, heat stress, contact with energized (hot) active equipment, noise, overhead bump hazards, and electrical shock that may be present during the Work.

D. Safety Act: The Williams-Steiger Occupational and Safety Health Act (OSHA) of 1970, as amended, shall be strictly complied with during the course of this project and all Work. OSHA shall govern the conduct of the Contractor's workmen, tradesmen, materialmen, and subcontractors, and of visitors to the project site.

E. Accident Prevention: In order to protect the lives and health of its employees, the Contractor shall comply with all pertinent provisions of the latest edition of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain an accurate record of all accidents which occur during the project. An injury or loss of life must be immediately reported by the Contractor to the LMDC, and a copy of the Contractor's report to its insurer of an accident or other event or loss must be provided to the LMDC as soon as possible.

F. Emergency Response: The Contractor shall establish an Emergency Response Team made up of members of its work force. Team members shall be trained, organized, and capable of responding in the event of an accident, fire, or other emergency. The Contractor shall designate a site Safety Coordinator to train team members regarding the location and use of site-specific fire/life safety equipment. As a minimum requirement, members of the Emergency Response Team shall be knowledgeable in standard first aid and CPR techniques, fire extinguisher use, and evacuation procedures.

G. Workmen Protection: The Contractor shall provide and maintain all safety measures necessary to properly protect workmen.

H. Emergency Actions: In an emergency affecting the safety of life, the work, or

adjoining property, the Contractor, to prevent such threatened loss or injury without special instruction or authorization from the Owner or the Engineer, is hereby permitted to act at his discretion.

I. Hazard Communication Act: The Contractor shall comply with the Hazard Communication Standard promulgated by the Occupational Safety and Health Administration (OSHA No. 29 CFR 1910.1200). This program ensures that all employers provide the information they need to inform and train employees properly and to design and put in place employee protection program. It also provides necessary hazard information to employees so they can participate in, and support, the protective measures needed at their work place. The contractor shall ensure that labels or other forms of warning are legible in English. Employer having employees who speak other languages may add the information in their languages. See OSHA 29 CFR 1910.1200 for more details.

1.9 ROLES AND RESPONSIBILITIES

A. The roles and responsibilities for this project are outlined in the Health and Safety Plan Section of the Deconstruction Plan (see Addendum 1).

1. Contractor: The Contractor must comply with all Specifications and Legal Requirements and employ appropriate means and methods to safely execute the Work.

2. Contractor's Supervisor: From the start of work through to the project completion the Contractor shall have on-site a responsible and competent supervisor who posses valid NYSDOL and NYCDEP Supervisor certifications. The Supervisor shall be on site during all working hours. When the Supervisor must leave site during work, a temporary NYSDOL/NYCDEP certified Supervisor shall be appointed.

3. Quality of Work: The Supervisor shall supervise, inspect and direct the Work competently and efficiently, devoting such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Supervisor shall be responsible to see that Work complies accurately with the Contract Documents, and that all Work installed is of good quality and workmanship.

1.10 AUTHORITY TO STOP WORK -

A. The Governmental Authorities, 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. The stoppage of work shall continue until conditions have been corrected to the satisfaction of the Owner's representative and Owner's Environmental Consultant Project Monitor. Standby time to resolve the problems shall be at the Contractor's expense. In addition, the occurrence of any or all of the following events shall be reported in writing to the Environmental Consultant Project Monitor and shall 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, whichever is greater).

b. Exceedances of US EPA Trigger Levels as contained within the Ambient Air Monitoring Program (Section 2 of the 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.

1.11 DEFINITIONS

A. General Explanation: Certain terms used in this Specification Section are defined below. Definitions and explanations of this Specification Section are not necessarily complete or exclusive, but are general for the Work to the extent they are not stated more explicitly in another element of the Contract Documents.

B. Definitions in General Use:

1. Approve: Where used in conjunction with Owner's response to submittals, requests, applications, inquiries, reports and claims by Contractor, the meaning of term "approved" shall be held to limitations of Engineer's responsibilities and duties as specified in Contract Documents. In no case shall "approval" by Engineer be interpreted as a release of Contractor from responsibilities to fulfill requirements of Contract Documents.

2. Directed, Requested, etc.: Where not otherwise explained, terms such as "directed," "requested," "authorized," "selected," "approved," "required," "accepted," and "permitted" mean "directed by Engineer," "requested by Engineer," and similar phrases. However, no such implied meaning will be interpreted to extend Engineer's responsibility into Contractor's responsibility for construction supervision.

3. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

4. Indicated: The term "indicated" is a cross-reference to graphic representations, notes or schedules on Drawings, to other paragraphs or schedules in the Specifications, and to similar means of recording requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used in lieu of "indicated," it is for purpose of helping reader locate cross-reference, and no limitation of location is intended except as specifically noted.

5. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at Project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.

6. Installer: The term "installer" is defined as the entity (person or firm) engaged by Contractor, or its subcontractor or sub-subcontractor for performance of a particular unit of work at Project site, including installation, erection, application and similar required operations. It is a general requirement that such entities (installers) be expert in operations they are engaged to perform.

7. City: The term "City" is defined as City of New York.

8. LMDC: The term "LMDC" is defined as the Lower Manhattan Development Corporation.

9. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

10. Testing Laboratory: The term "Testing Laboratory" is defined as an entity engaged to perform specific inspections or tests of the work, either at Project site or elsewhere; and to report and (if required) interpret results of those inspections or tests.

11. URS: The term "URS" is defined as URS Corporation – New York. URS has been authorized to act as LMDC's representative relative to coordinating construction activities at the site relating to the project described in the Contract Documents

C. Definitions Relative to Asbestos Abatement:

1. Abatement: Procedures physically taken to control fiber release from ACM. This includes removal, encapsulation, enclosure, and repair.

2. Aggressive Sampling: Method of sampling in which the individual collecting the air sample creates activity by the use of mechanical equipment during the sampling period to stir up settled dust and simulate activity in that area of the building.

3. AIHA: American Industrial Hygiene Association.

4. Airlock: System for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

5. Air Sampling: Process of measuring the fiber content of a known volume of air collected during a specific period. The procedure utilized for

asbestos follows the NIOSH Standard Analytical Method 7400, or the provisional transmission electron microscopy methods developed by the US EPA which is utilized for lower detection levels and specific fiber identification.

6. Amended Water: Water to which a surfactant has been added.

7. ANSI: American National Standards Institute

8. Area Air Sampling: Any form of air sampling or monitoring where the sampling device is placed at some stationary location.

9. Asbestos: Any hydrated mineral silicate separable into commercially usable fibers, including but not limited to chrysotile (serpentine), amosite (cumingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite and actinolite.

10. ACBM: Materials installed in the Building prior to September 11, 2001 and considered to be Asbestos-Containing Materials.

11. Asbestos-Containing Waste Material: ACM or asbestos-contaminated objects requiring disposal.

12. Asbestos Handler: Individual who disturbs, removes, repairs, or encloses friable asbestos. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL. All asbestos handlers shall be knowledgeable, qualified, and trained in the removal, handling, and disposal of asbestos material and in subsequent cleaning of the affected environment. All asbestos abatement workers shall be certified as having attended and satisfactorily completed asbestos worker training in accordance with OSHA Standard 29 CFR 1926.1101(k)(3). A NYSDOH-approved training provider must provide course.

13. Asbestos Handler Supervisor: Individual who supervises the handlers during an asbestos project and ensures that proper asbestos abatement procedures as well as individual safety procedures are being adhered to. This individual shall have completed approved training course(s) and be in possession of certification issued by NYCDEP and NYSDOL. This individual shall have successfully completed, within the last twelve months, the NYSDOH-approved course "Supervision of Asbestos Abatement Projects", and shall be a NYCDEP and NYSDOL-certified Contractor/Supervisor. A NYSDOH-approved training provider must provide course. The supervisor shall have experience with abatement work, as evidenced through participation in at least two asbestos abatement projects of complexity comparable to this project.

14. Asbestos Handling Certificate: Certificate(s) issued to individuals who

have met the criteria established by NYCDEP and/or NYSDOL.

15. Asbestos Inspection Report: A report on the condition of a building or structure in relation to the presence and condition of asbestos therein.

16. Asbestos Inspector/Investigator: An individual certified by NYCDEP and NYSDOL as having successfully demonstrated his or her ability to identify the presence of and evaluate the condition of asbestos in a building or structure.

17. Asbestos Project: Any form of work performed in connection with the alteration, innovation, modification, or demolition of a building or structure which will disturb (e.g. remove, enclose, encapsulate) more than three linear feet or more than three square feet of friable ACM.

18. ASTM: the American Society for Testing and Materials.

19. Authorized Visitor: Owner and his/her representative, and any representative of a regulatory or other agency having jurisdiction over the project.

20. Building City: Person in whom legal title to the premises is vested unless the premises are held in land trust, in which instance Building City means the person in whom beneficial title is vested.

21. Certified Industrial Hygienist (CIH): Individual with a minimum of five years experience as an industrial hygienist and who has successfully completed both levels of the examination administered by the American Board of Industrial Hygiene and who is currently certified by that board.

22. Certified Safety Professional (CSP): Individual having a bachelor's degree from an accredited college or university and a minimum of four years experience as a safety professional and who has successfully completed both levels of the examination administered by the Board of Certified Safety Professionals and who is currently certified by that board.

23. Clean Room: An uncontaminated area or room that is part of worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.

24. Clearance Air Monitoring: Employment of aggressive sampling techniques with a volume of air collected to determine the airborne concentration of contaminants and shall be performed as the final abatement activity.

25. Curtained Doorway: Device that consists of at least three overlapping sheets of polyethylene over an existing or temporarily framed doorway. One sheet shall be secured at the top and left side, the second sheet at the

top and right side, and the third sheet at the top and left side. All sheets shall have weights attached to the bottom to ensure that the sheets hang straight and maintain a seal over the doorway when not in use.

26. Decontamination Enclosure System: Series of connected rooms, separated from the Work Area and from each other by air locks, for the decontamination of workers, materials, waste containers, and equipment.

27. Department: NYSDOL.

28. Encapsulant (sealant) or Encapsulating Agent: Liquid material which can be applied to ACM and which temporarily controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). This may also be used to seal surfaces from which ACM has been removed.

29. Encapsulation: Coating or spraying of ACM with a sealant.

30. Enclosure: Construction of airtight walls and/or ceilings between ACM and the facility environment, or around surfaces coated with ACM, or any other appropriate procedure as determined by the Department which prevents the release of asbestos fibers.

31. ELAP: Environmental Laboratory Approval Program administered by the New York State Department of Health.

32. EPA or USEPA: United States Environmental Protection Agency.

33. Equipment Room: Contaminated area or room that is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.

34. Fixed Object: Unit of equipment or furniture in the Work Area that cannot be removed from the Work Area.

35. Friable Asbestos Material: Asbestos or any ACM that can be (or is) crumbled, pulverized, or reduced to powder when dry, by hand or other mechanical pressure.

36. Glove-Bag Technique: Method for removing friable ACM from heating, ventilation, and air conditioning (HVAC) ducts, short piping runs, valves, joints, elbows, and other nonplanar (SP) surfaces in a non-contained Work Area. The glove-bag assembly is a manufactured device consisting of a glove-bag (constructed of at least 6-mil transparent polyethylene), two inward-projecting long sleeve gloves, one inward-projecting waterwand sleeve, an internal tool pouch, and an attached, labeled receptacle for asbestos waste. The glove-bag is constructed and installed in such a

manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process.

37. HEPA-Filter: High efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles greater than 0.3 micrometers mass median aerodynamic equivalent diameter.

38. Holding Area: Chamber in the equipment decontamination enclosure located between the washroom and an uncontaminated area.

39. Homogeneous Work Area: Portion of the Work Area that contains one type of ACM and/or where one type of abatement is used.

40. Industrial Hygiene: Science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among worker or among the citizens of the community.

41. Industrial Hygienist: Individual having a college or university degree or degrees in Engineering, Chemistry, Physics or Medicine, or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:

    a. To recognize the environmental factors and to understand their effect on people and their well being; and
    b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair people's health and well being; and
    c. To prescribe methods to eliminate, control, or reduce such stresses when necessary to alleviate their efforts.

42. Large Asbestos Project: Asbestos project involving the disturbances (e.g. removal, enclosure, encapsulation) of 260 linear feet or more of ACM or 160 square feet or more of ACM.

43. Major Violation: Any action, on the job performance or lack of performance that may place any individual at risk other than the worker who commits the violation. A major violation is equivalent to two violation points.

44. Minor Asbestos Project: Project involving the disturbance (e.g. removal, enclosure, encapsulation, repair) of more than three linear feet, but not more than 25 linear feet of ACM or more than three square feet, but not more than ten square feet of ACM.

45. Minor Violation: Any action, on the job performance or lack of performance that may place the worker at risk. A minor violation is equivalent to one violation point.

46. Movable Object: Unit of equipment or furniture in the Work Area that can be removed from the Work Area.

47. Negative Air Pressure Equipment: Portable local exhaust system equipped with HEPA filtration. The system shall be capable of creating a negative pressure differential between the outside and inside of the Work Area.

48. NESHAPS: National Emission Standards for Hazardous Air Pollutants.

49. NIOSH: National Institute for Occupational Safety and Health.

50. NYSDOL: New York State Department of Labor.

51. Occupied Area: Area of the work site where abatement is not taking place and where personnel or occupants normally function or where workers are not required to use personal protective equipment.

52. OSHA: Occupational Safety and Health Administration.

53. Person: Individual, partnership, company, corporation, association, firm, organization, governmental agency, administration, or department, or any other group of individuals, or any officer or employee thereof.

54. Personal Air Monitoring: Method used to determine employees' exposure to airborne fibers. The sample is collected outside the respirator in the worker's breathing zone.

55. Personal Protective Equipment (PPE): Appropriate protective clothing, gloves, eye protection, footwear, and head gear.

56. Physician: Person licensed or otherwise authorized under Article 131 Section *65.22* of the New York State Education Law.

57. Plasticize: Cover floors and walls with polyethylene sheeting as herein specified or by using spray plastics as acceptable to the Department.

58. Professional Engineer (PE): Individual having, at a minimum, a bachelor's degree in engineering from an accredited college or university with four years acceptable experience as an engineer and who has successfully completed both levels of the professional engineers examination administered by the State of New York Department of Education, Division of Professional Licensing.

59. Qualitative Fit Test: Individual test subject's responding (either

voluntarily or involuntarily) to a chemical challenge outside the respirator face-piece. Three of the most popular methods include: 1) irritant smoke test; 2) odorous vapor test; and 3) taste test.

60. Quantitative Fit Test: Exposing the respiratory wearer to a test atmosphere containing an easily detectable, nontoxic aerosol, vapor or gas as the test agent. Instrumentation, which samples the test atmosphere and the air inside the face-piece of the respirator, is used to measure quantitatively the leakage into the respirator. There are a number of test atmospheres, test agents, and exercises to perform during the test.

61. Registered Architect (RA): Individual having, at a minimum, a bachelor's degree in architecture from an accredited college or university with three years acceptable experience as an architect and who has successfully completed both levels of the architects registration examination administered by the State of New York Department of Education, Division of Professional Licensing.

62. Removal: Stripping of any ACM from surfaces or components of a facility or taking out structural components in accordance with 40 CFR 61 Subparts A and M.

63. Shower Room: Room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold running water controllable at the tap and arranged for complete showering during decontamination.

64. Small Asbestos Project: asbestos project involving the disturbance (e.g. removal, enclosure, encapsulation) of more than 25 and less than 260 linear feet of ACM or more than ten and less than 160 square feet of ACM.

65. Staging Area: Work Area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the Work Area.

66. Structural Member: Load-supporting member of a facility, such as beams, floor slabs and load-supporting walls, or any non load-supporting member, such as ceiling and nonload- supporting walls.

67. Surfactant: Chemical wetting agent added to water to improve penetration.

68. Visible Emissions: Emissions containing particulate material that are visually detectable without the aid of instruments.

69. Washroom: Room between the Work Area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA-vacuumed prior to disposal.

70. Wet Cleaning: Removal of asbestos fibers from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water.

71. Work Area: Designated rooms, spaces, or areas of the building or structure where asbestos abatement activities take(s) place.

72. Worker Decontamination Enclosure System: Portion of a decontamination enclosure system designed for controlled passage of workers and authorized visitors, consisting of a clean room, a shower room, and an equipment room separated from each other and from the Work Area by airlocks and curtained doorways.

73. Work Site: Premises where abatement activity is being performed. May be composed of one or more Work Areas.

1.12 STANDARD OPERATING PROCEDURES

A. Develop and implement a written standard procedure as part of the Implementation planfor abatement work to ensure maximum protection and safeguard from asbestos and COPC exposure of the workers, visitors, employees, public, and environment.

B. The standard operating procedure shall ensure:

1. Restriction of Contractor's personnel to the immediate Work Area and access/egress routes.

2. Donning of proper protective clothing and respiratory protection prior to entering the Work Area.

3. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or in any way breaking the respiratory protection.

4. Proper exit practices from the work space to the outside through the showering and decontamination facilities.

5. Removing asbestos in ways that minimize release of fibers.

6. Packing, labeling, loading, transporting, and disposing of regulated and/or Hazardous Material in a way that minimizes exposure and contamination.

7. Emergency evacuation procedures, for medical or safety situations, to minimize the potential exposure to airborne asbestos fibers for emergency personnel, building occupants, and building environment.

8. Safety from accidents in the workspace, especially from electrical shocks, fall hazards associated with scaffolding, slippery surfaces, and entanglements in loose hoses and equipment.

9. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work.

10. Engineering systems that minimize exposure to fibers within the workspace.

C. Provide an Asbestos Handler Supervisor to provide continuous supervision of all work, and to be responsible for the following:

1. Ensure that individuals are using proper personal protective equipment and are trained in its use.

2. Maintain entry log records and ensure that they are recorded in accordance with the provisions of Title *15,* Chapter 1 of RCNY and ICR-56.

3. Surveillance of the Work Areas at a minimum of once per work shift or as required by Title *15,* Chapter 1 of RCNY and ICR-56.

4. to ensure that the workers personal protective equipment is not torn or ripped and that respiratory protection is worn at all times.

5. Ensure that sufficient personal protective equipment is stored in the clean room.

6. Take precautions to prevent heat stress. Precautions include, but are not limited to, selecting lightweight protective clothing, reducing the work rate, and providing adequate fluid breaks.

D. Engineering Controls:

1. The negative pressure ventilation equipment shall operate continuously, 24 hours a day, from the establishment of isolation barriers through successful clearance air monitoring. If such equipment shuts off, adjacent areas shall be monitored for asbestos fibers.

2. A static negative air pressure of 0.02 inches (minimum) water column shall be maintained at all times in the work place during abatement to ensure that contaminated air in the Work Area does not filter back to uncontaminated areas. In addition, increased air changes shall be required per the Variance Decision Conditions.

3. On loss of negative pressure or electric power to the negative pressure ventilating units, abatement shall stop immediately and shall not resume

until power is restored and negative pressure ventilation equipment is operating again.

a. All make up air inlets shall be sealed airtight.

b. All decontamination facilities shall be sealed airtight after evacuation of all personnel from the Work Area.

4. Negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas.

a. At no time shall the negative pressure ventilation unit exhaust within 50 feet of a receptor or adversely affect the intake ports, louvers, or entrances for the building or adjacent buildings.

b. Heavy duty ducting of equivalent, or larger, shape and dimension as that of the negative pressure ventilation exhaust port shall be used to exhaust to the structure.

c. All ducting shall be sealed and braced or supported to maintain airtight joints.

5. In the event that there is a failure of the containment system or a breech in the Isolation Barriers, all abatement work shall cease and the Contractor shall immediately correct the condition. Abatement work shall not resume until the Work Area has been smoke tested by Contractor and reviewed by the Owner.

1.13 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS, AND POSTERS

A. Erect bilingual (English-Spanish, and predominant language of work crew) warning signs around the work space and at every point of potential entry from the outside and at main entrance to building which can be viewed by the public without obstruction, in accordance with OSHA 29 CFR 1926.1101 (K) (Sign Specifications) and ICR 56. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than OSHA requirements.

B. Provide the required labels for all polyethylene bags and all drums utilized to transport contaminated material to the landfill in accordance with OSHA 29 CFR 1926.1101 (K)(2) and by 49 CFR Parts 171 and 172 of the Department of Transportation regulations.

C. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Post in a prominent and convenient place for the workers a copy of the latest applicable regulations from OSHA, EPA, NIOSH, State of New York and

New York City and any additional items mandated for posting by the aforementioned regulations.

D. Furnish all permits, variances and notices required to perform the Work.

1.14 EMERGENCY PRECAUTION/FIRE PROTECTION/EMERGENCY EGRESS AND 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 Contractor 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 Phase I 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 exclusive use by qualified emergency personnel in the clean room of the decontamination facility.

B. The Contractor shall provide a 24-hour fire watch throughout the entire term of the project, to protect against fire and unauthorized entry into the workspace. Fire watch shall be a certified asbestos handler by New York State Department of Labor (NYSDOL) 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' for emergency egress during Phase I Deconstruction activities. Refer to the Emergency Action Plan found within Section 3 of the Phase I Deconstruction Plan for more details.

E. Notify local medical emergency personnel, both ambulance crews and hospital emergency room staff prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workmen, and shall be advised on safe decontamination.

F. Prepare to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated immediately for decontamination. When an injury occurs, precautions shall be taken to reduce airborne fiber concentrations (i.e. misting of the air with water) until the injured person has been removed from the Work Area.

G. Notify, before actual abatement activities, the local police and fire departments to the danger of entering the Work Area. Contractor shall make every effort to help these agencies form plans of action should their personnel need to enter the contaminated area.

H. Emergency Response Team: The Contractor shall establish an Emergency Response Team made up of members of his work force. Team members shall be trained, organized, and capable of responding in the event of an accident, fire, or other emergency. The Contractor shall designate a site Safety Coordinator to train team members regarding the location and use of site-specific fire/life safety equipment. As a minimum requirement, members of the Emergency Response Team shall be knowledgeable in standard first aid and CPR techniques, fire extinguisher use, and evacuation procedures.

1.15 SUBMITTALS

A. Pre-Construction Submittals

The detailed Implementation Plan must be submitted and approved by the Owner and/or Owner's Authorized Representative prior to beginning Work. The Contractor shall present nine (9) copies, bound and indexed, of the following items for approval:

a. Contractor's scope of work, Implementation Plan and schedule.

b. Notifications to Government Agencies including NYSDOL, NYCDEP, USEPA, etc. Also proof of written notification to the local police department and fire department that abatement work is being conducted. As a minimum, the notification letter shall include the address of the Facility, dates work is to be performed, and drawings indicating the areas to undergo abatement.

c. Copies of Permits, clearance and licenses if required.

d. Schedules: the Contractor shall provide to the Owner a copy of the following schedules for approval. Once approved, schedules shall be maintained and updated as received. Contractor shall post a copy of all schedules at the site:

(1) A construction schedule showing sequencing of the work, floor by floor activities, total time of each activity, and critical dates including, but not limited to, mobilization, Work Area preparation, demolition, gross removal, fine cleaning, encapsulation (if performed), inspections, clearance monitoring, and phase of refinishing and final inspections. The schedule shall be updated biweekly, at a minimum.

(2) A schedule of staffing stating number of workers per shift per activity, name and number of supervisor(s) per shift, shifts per day, and total days to be worked.

(3) Submit all proposed changes in schedule or staffing to the Owner for its review and approval prior to implementation

(4) A schedule of equipment to be used including numbers and types of all major equipment such as HEPA Air Filtration Units, HEPA-vacuums, airless sprayers, Water Atomizing Devices and Type "C" compressors.

e. Provide a written Implementation plan and shop drawings for the preparation of work site and decontamination chambers that meet the requirements of the LMDC Deconstruction Plan, these Specifications and other Contract Documents, and all Legal Requirements including but not limited to approved NYSDOL Variance Decisions and Conditions. Provide a detailed description of the work area enclosure. Provide shop drawings (with dimensions and locations) of proposed decontamination facilities and work areas. These drawings shall indicate the following: 1) areas to be sealed off and work area boundaries; 2) proposed layout and location of the decontamination enclosure systems; 3) work area preparation procedures, including dust control and containment measures to prevent a release into the environment. Include a detailed description of any modifications or changes to be made to the specified negative pressure work area enclosure. Describe methods for sealing stairwells, shafts and other openings between floors. Provide a List of Subcontractors.

f. Health and Safety Plan: Provide a written Health and Safety Plan addressing procedures for work place safety. As a minimum, the HASP shall be compliant with the requirements of the HASP section of the LMDC Deconstruction Plan. The following additional topics shall be addressed in the plan:

Hazard Communication. Procedure on how physical and health hazards associated with the work are identified and communicated to employees, and name of the person responsible for implementation of the Hazard Communication Program. HAZWOPER and asbestos training shall be required per the LMDC Deconstruction Plan HASP.

a) Guidelines for assessment and prevention of heat stress.

b) Procedures for using ladders safely.

g. Electrical safety procedures.

h. Emergency Action Plan: The Contractor shall submit for review a written Emergency Action Plan. This Plan shall be compliant with the

requirements of the LMDC Deconstructions Plan EAP at a minimum and shall outline the contingency actions to be performed for emergencies including fire, accident, power failure, supplied air system failure, breach of work area containment, unexpected asbestos contamination in the site area and on the adjoining grounds, or spilling of asbestos material being hauled to storage and/or disposal. This Plan shall identify the manner in which emergencies are announced, emergency escape procedures and routes, and procedures to account for all employees after evacuation. The Plan shall identify those persons responsible for fire/life safety duties including the Site Safety Coordinator, persons responsible for fire prevention equipment and the control of fuel source hazards, and the members of the Emergency Response Team (see Paragraph "Emergency Response" of this Section). This Plan shall be readily available for review by all workers.

i. Fall Protection Plan: The Contractor shall submit for review a written Fall Protection Plan. This plan shall outline the actions to be performed to protect personnel when they are working at elevation. The plan shall detail specific fall protection devices to be utilized, training provided to personnel for same and training of designated competent person in charge of and responsible for the elevated work site.

j. Delineation of management structure (organizational chart) showing responsibility of work site supervision, including competent person, with names, titles, resumes, and home telephone numbers. List responsible personnel for each floor, loading dock, elevator, etc. Use titles defined in ICR 56-2.2.

k. Explanation of decontamination sequence and isolation techniques.

l. Description of specific equipment to be utilized, including make and model number of air filtration devices, vacuums, sprayers, etc supported by calculations for negative pressure ventilation equipment.

m. Description of any prepared methods, procedures, techniques, or equipment other than those specified in the Contract Documents.

n. Explanation of the handling of contaminated wastes including EPA and NYSDEC identification numbers of Waste Hauler.

o. Description of the final clean-up procedures to be used.

m. Name and qualifications of Contractor’s testing laboratory including AIHA accreditation, and proof of NIOSH PAT and NIST/NVLAP Bulk Quality Assurance Proficiency of OSHA samples for approval by Owner. Provide a list of analytes to be

tested with corresponding turn-around-time (24 hours or less), reporting schedule and frequency. Indicate how and when samples will be collected, frequency of calibrations, where filters will be stored and how they will be transported.

n. Written description of emergency procedures to be followed in case of injury or fire. This section must include evacuation procedures, source of medical assistance (name and telephone number) and procedures to be used for access by medical personnel (examples: first aid squad and physician). NOTE: Necessary Emergency Procedures Shall Take Priority Over All Other Requirements of These Specifications.

o. Material Safety Data Sheets (MSDS) for encapsulants, sealants, fire stopping foam, cleaners/disinfectants, spray adhesive, and any and all materials that may be employed on the project. No work involving the aforementioned will be allowed to proceed until MSDS are reviewed.

p. Worker Training and Medical Surveillance: Contractor shall submit a list of the persons who will be employed by it and its Subcontractors in the removal work. Present evidence that workers have received proper training required by the LMDC HASP and regulations and the medical examinations required by OSHA 29 CFR 1926.110 1.

q. Logs: Specimen copies of daily progress log, visitor's log, and disposal log.

(1) The Contractor shall provide a permanently bound logbook of minimum 8-1/2" x 11" size at the entrance to the Worker and Waste Decontamination enclosure system as hereinafter specified. Log book shall contain on title page the project name, name, address and phone number of Environmental Control Representative; name, address and phone number of Abatement Contractor; name, address and phone number of Contractor and Environmental Consultant Project Monitor; emergency numbers including, but not limited to local Fire/Rescue Department.

(2) All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted. Any significant events occurring during the abatement project shall be entered into the log. Upon completion of the job, the Contractor shall submit the logbook containing

a day-to-day record of personnel log entries.

r. Worker's Acknowledgments: Submit statements signed by each employee that the employee has reviewed and will comply with the Contractor's HASP, received training in the proper handling of ACM and COPCs and understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.

s. Air sampling plans listing type, schedule and location.

B. Submit copies of the following items to the Owner during the work:

1. Security and safety logs showing names of person entering workspace, date and time of entry and exit, record of any accident, emergency evacuation, and any other safety and/or health incident.

2. Progress logs showing the number of workers, supervisors, hours of work and tasks completed shall be submitted to the Owner.

3. Floor plans indicating Contractor's current work progress shall be submitted for review by the Owner at weekly progress meetings.

4. All Contractor's air monitoring and inspection results.

5. Resubmit any revised documents submitted prior to or during construction.

C. Project Closeout Submittals

Upon completion of the project and as a condition of acceptance, the Contractor shall present two copies of the following items, bound and indexed:

1. Lien Waivers from Contractor, Sub-Contractors and Suppliers. A notarized "Release of claims" in a form acceptable to the Owner. Such notarized release of all claims shall certify that all subcontractors, labor suppliers, etc., have been paid their pro rate share of all payments to date, that the contractor has no basis for further claim, and will not make further claim for payment in any account after the payment is made to him.

2. All air monitoring results in chronological order.

3. All Waste Manifests (Asbestos, Hazardous Materials, Regulated Waste and Construction Debris), seals and disposal logs.

4. Field Sign-In Sign-Out and Contractor Daily Project Logs for every shift.

5. Copies of all Building Department Forms and Permits.

6. A Letter of Compliance stating that all the work on this project was performed in accordance with the Specifications and all applicable Federal, State and Local regulations, including all Variance requirements,

7. All Warranties as stated in the Specifications,

   a. Fully executed disposal certificates and transportation manifest.

   b. Copies of notifications and checks to applicable agencies that the asbestos abatement project has been completed.

1.16 QUALITY ASSURANCE

A. All work required for the completion of this project or called for in this Specification must be executed in a workmanlike manner by using the appropriate methods established by regulatory requirements and/or industrial standards. All workmanship or work methods are subject to review and acceptance by the Owner. Throughout the Specification, reference is made to codes and standards that establish qualities, levels or types of workmanship that shall be considered acceptable. It is the Abatement Contractor's responsibility to comply with these and any other applicable codes and standards during the execution of this work.

B. All materials and equipment required or consumed during the work of this Contract must meet the minimum acceptable criteria established by codes and standards referenced elsewhere in this Specification. Materials and equipment must be submitted for prior approval as part of the Contractor's "Shop Drawings".

C. It is the Abatement Contractor's responsibility, when so required by the Specification or upon written request from the Owner to furnish all required proof that workmanship, materials and/or equipment meet or exceed the codes and standards referenced. Such proof shall be in the form requested, typically a certified report or test conducted by a testing entity approved for that purpose.

D. The Contractor shall furnish proof that employees working under his supervision have had instruction on the dangers of asbestos exposure, on respirator use, decontamination, and OSHA regulations. This proof shall be in the form of a notarized affidavit to the effect that the above requirements have been satisfied.

E. The Contractor shall have at all times in his possession and in view at the job site the OSHA regulations 29 CFR 1910.1001, and 1926.1101 Asbestos, and Environmental Protection Agency 40 CFR, Part 61, subpart B: National Emission Standard for asbestos, asbestos stripping, work practices and disposal of asbestos waste. He shall also have one copy of NYC Title *15,* Chapter 1 of RCNY and NYS DOL ICR 56 at the job site at all times.

F. Familiarity with Pertinent Codes and Standards: In procuring all items used in this work, it is the Contractor's responsibility to verify the detailed requirements of

the specifically named codes and standards and to verify that the items procured for use in this work meet or exceed the specified requirements, and are suitable for their intended use.

G. Rejection of Non Complying Items: Owner reserves the right to reject items incorporated into the work that fail to meet the specified minimum requirements. Owner further reserves the right, and without prejudice to other recourse that maybe taken, to accept non-complying items subject to an adjustment in the Contract amount.

H. Applicable Regulations, Codes and Standards: Applicable standards listed in these Specifications include, but are not necessarily limited to, standards promulgated by the following agencies and organizations:

1. United States Environmental Protection Agency (EPA or USEPA)
   Region II
   Asbestos NESHAPS Contact
   Air & Waste Management Division
   (Air Compliance Branch) - USEPA
   Federal Plaza, Room 500
   New York, New York 10278
   212-264-6770

2. New York State Department of Environmental Conservation (NYSDEC)
   Division of Solid and Hazardous materials
   625 Broadway
   Albany, New York 12233

3. Occupational Safety and Health Administration (OSHA)
   Region II - Regional Office
   Federal Plaza, Room 900
   New York, New York 10278
   212-264-2525

4. National Electrical Code (NEC) See NFPA

5. National Fire Protection Association (NFPA) Atlantic Avenue
   Boston, Massachusetts 02201

6. National Institute for Occupational Safety and Health (NIOSH)
   Robert A. Taft Laboratory
   Columbia Pkwy
   Cincinnati, Ohio 45226-1998
   800-3 5-NIOSH

7. Department of Health and Human Services (DHHS)
   Asbestos Removal
   Federal Plaza

New York, New York 10007
212-264-2560

8. Specifications Sales (3F21) Building 197, Washington Navy Yard, GS Washington, DC

9. American National Standards Institute (ANSI)
(Successor to USASI and ASA)
11 West 42nd Street
New York, New York 10036

10. American Society for Testing and Materials (ASTM)
100 Bar Harbor Drive
West Conshohocken, PA 19428-2959

11. New York City Department of Environmental Protection (NYCDEP)
Bureau of Air Resources
59-17 Junction Boulevard, 8th Floor
Corona, New York 11368
718-595-3682

12. New York City Department of Sanitation
125 Worth Street, Room 710
New York, New York 10013
212-566-1066

13. New York State Department of Labor (NYSDOL)
Division of Safety and Health
Engineering Services Unit
State Office Building Campus
Albany, New York 12240

I. Post all applicable regulations in a conspicuous place at the job site. Assure that the regulations are not altered, defaced or covered by other materials. One copy of each regulation must also be kept at Contractor's office.

1.17 OWNER/CONTRACTOR RESPONSIBILITIES

A. Contractor shall perform the work of this Contract in a manner that will be least disruptive to the normal use of the non-Work Areas in the building. Contractor shall be solely responsible for all means and methods used for the execution of the Work.

B. Contractor shall be responsible for cleaning and removal of items in the Work Areas.

C. Owner will not occupy the portions of the building, in which work is being

performed during the entire asbestos removal operation, including completion of clean up.

D. Contractor shall provide a plan for 24 hours job security both for prevention of theft and for barring entry of curious but unprotected personnel into Work Areas.

E. Should the failure of any utility occur, the Owner will not be responsible to the Contractor for loss of time or any other expense incurred.

1.18 USE OF BUILDING FACILITIES

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 Phase I Deconstruction Plan.

B. Fire Extinguishers - As per Section 3 of the Emergency Action Plan of the Deconstruction Plan for 130 Liberty Street, portable fire extinguishers shall 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 the Contractors EAP – with the list of emergency contacts and telephone numbers, location of nearest hospital and emergency response agencies.

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

during the asbestos project.

7. A copy of the Contractors HASP and Work Plan.

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.

D. Electric power to all Work Areas shall be shut down and locked out. Safe temporary power and lighting shall be provided by Contractor in accordance with applicable codes. All power to Work Areas shall be brought in from outside the area through ground-fault interrupter circuits installed at the source. Stationary electrical equipment within the Work Area, which must remain in service, shall be adequately protected, enclosed and ventilated. Contractor shall protect all lines.

E. Contractor shall provide, at its own expense, all electrical, water, and waste connections, tie-ins, extensions, and construction materials, supplies, etc. All water tie-ins shall be hard piped with polyethylene or copper piping. At the end of each shift, Contractor shall disconnect all hoses within the work zone and place in equipment room of the worker decontamination unit. Contractor shall ensure positive shutoff of all water to Work Area during non-working hours.

F. Utilities:

1. General:

All temporary utility work or adaptations to supply the needs of the Work Area shall be installed and removed by the Contractor and the cost thereof included in the Lump Sum price Bid for abatement work. All temporary facilities required to be installed, shall be subject to the approval of Owner. Prior to starting the work at any location, specify clearly the temporary locations of facilities preferably with sketches and submit the same to the Owner for approval. Any maintenance or repair of existing utilities required to keep the utilities operational and safe shall be the responsibility of the Contractor at no extra cost to Owner. Utility consumption costs (utility bills) shall be included in the Lump Sum price Bid for abatement work. It is the Contractor's responsibility to furnish and install a suitable distribution system to the Work Area. This system shall be provided at no cost to the Owner. When temporary service lines are no longer required, the Contractor shall remove them. The Contractor shall restore any parts of the permanent service lines, grounds and buildings, disturbed or damaged by the installation and/or removal of the temporary

service lines, to their original condition.

2. Water:

The water in the existing original domestic water system has been previously tested and the presence of *Legionella* bacteria has been identified. For the most part, this system has been drained however work that impacts residual water in the domestic water system shall follow appropriate precautions for protecting workers from exposure to *Legionella*.

Each floor contains a hose bib connection to a newly installed (not part of the original domestic water system) two inch (2") water riser that may be used to supply water. Provide all temporary plumbing or adaptations to supply the needs of the Work Area. Shower water for the decontamination unit shall be provided hot. Heating of water, if necessary, shall be provided by the Contractor.

a. Temporary Water Service Connection: All connections to the water system shall include back flow protection. Valves shall be temperature and pressure rated for operation of the temperature and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping, and equipment. Leaking or dripping fittings/valves shall be repaired and or replaced as required.

b. Water Hoses: Employ new heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each Work Area and to each Decontamination Enclosure Unit. Provide fittings as required for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers shut-off nozzles and equipment.

c. Water Heater: Provide UL rated 40-gallon electric water heaters to supply hot water for Personal Decontamination Enclosure System Shower. Activate from 30 Amp Circuit breakers located within the Decontamination Enclosure sub panel. Provide relief valve compatible with water heater operations, pipe relief valve down to drip pan at floor level with type 'L' copper piping. Drip pans shall be 6-inch deep and securely fastened to water heater. Wiring of the water heater shall comply with NEMA, NECA, and UL standards.

3. Electricity:

Contractor shall provide a separate temporary electric panel board to power Contractor's equipment. Each floor has available for contractor's use 400 amp service (contractor to field verify). Contractor's appropriately certified (NYSDOL) and licensed electrician shall provide temporary tie-

in via cable, outlet boxes, junction boxes, receptacles and lights, all with ground fault interruption. At no time shall extension cords greater than 50-feet in length be allowed. All temporary electrical installation shall be in accordance with OSHA regulations. Additional electrical equipment (i.e. transformers, etc.), which is necessary due to the lack of existing power on the floor, shall be at the Contractor's expense.

a. General: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

b. Temporary Power: Provide service to decontamination unit sub panel with minimum 60 AMP, two-pole circuit breaker or fused disconnect connected to the building's main distribution panel. Sub panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.

c. Voltage Differences: Provide warning signs at power outlets that are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.

d. Ground Fault Protection: Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate the GFCIs outside the Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in Work Area, decontamination units, exterior, or as otherwise required by NEC, OSHA or other authority.

e. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least subject to damage from operations.

f. Temporary Wiring: In the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Provide liquid tight enclosures or boxes for all wiring devices. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors.

g. Electrical Power Cords: Use only grounded extension cords; use hard service cords where exposed to traffic and abrasion. Use single lengths of cords only.

h. Temporary Lighting: All lighting within the Work Area shall be

liquid and moisture proof and designed for the use intended. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting. Provide lighting in the Decontamination Unit as required to supply a minimum 50-foot candle light level.

1.19 USE OF THE PREMISES

A. Contractor shall confine its apparatus, the storage of materials, and supplies, and the operation of its workmen to limits established by law, ordinances, and the directions of the Owner. All flammable or combustible materials shall be properly stored to obviate fire.

B. Contractor shall assure that no exits from the building are obstructed, that appropriate safety barriers are established to prevent access, and that Work Areas are kept neat, clean, and safe.

C. All surrounding work, fixtures, soil lines, drains, water lines, gas pipes, electrical conduit, wires, utilities, duct work railings, shrubbery, landscaping, etc. which are to remain in place shall be carefully protected and, if disturbed or damaged, shall be repaired or replaced as directed by the Owner, at no additional cost.

D. Attention is specifically drawn to the fact that other Contractors, performing the work of other Contracts, may be (or are) brought upon any of the work sites of this Contract. Therefore, the Contractor shall not have exclusive rights to any site of his work and shall fully cooperate and coordinate his work with the work of other Contractors who may be on (or are on) any site of the work of this Contract. Regulated area exempted.

E. Temporary toilet facilities must be provided by the Contractor on the site. Coordinate location of facilities with Owner. No toilet facilities will be allowed in the Work Area.

1.20 PROTECTION AND DAMAGE

A. No materials or debris shall be thrown from windows or doors of the building. Building waste system shall NOT be used to remove refuse.

B. Debris shall be removed from the work site daily. Premises shall be left neat and clean after each work shift, so that work may proceed the next regular workday without interruption. Limited properly packaged and labeled waste storage may take place within the Work Area if approved in advance and in writing by the Owner.

1.21 RESPIRATORY PROTECTION REQUIREMENTS

A. Respiratory protection shall be worn by all individuals from the initiation of the abatement project until a work area has successfully passed clearance air monitoring in accordance with Regulations and these Specifications.

B. Contractor shall develop and implement a written respiratory protection program with required site-specific procedures and elements. The program shall be administered by a properly trained individual. The written respiratory protection program shall include the requirements set forth in OSHA Standard 29 CFR 1910.134 and the Deconstruction Plan HASP, at a minimum.

C. The Contractor shall provide workers with individually issued and marked respiratory equipment. Respiratory equipment shall be suitable for the asbestos exposure level(s) in the Work Area(s), as specified in OSHA Standards 26 CFR 1910.134 and 29 CFR 1926.1101, NIOSH Standard 42 CFR 84, or as more stringently specified otherwise, herein. Respirators shall not be marked with any equipment that will alter the fit of the respirator in any way. Only waterproof identification markers shall be used.

D. Where respirators with disposable filter parts are employed, the Contractor will provide sufficient filter parts for replacement as necessary or as required by the applicable regulation and the Deconstruction Plan HASP.

E. All respiratory protection shall be NIOSH approved. All respiratory protection shall be provided by Contractor, and used by workers in conjunction with the written respiratory protection program.

F. Contractor shall provide respirators selected by an Industrial Hygienist that meet the requirements of the Deconstruction Plan HASP.

G. Selection of high efficiency filters:

1. All high efficiency filters shall have a nominal efficiency rating of 100 (99.97-percent effective) when tested against 0.3-micrometer monodisperse diethyl-hexyl phthalate (DOP) particles.

2. Choose N-, R-, or P-series filters based upon the presence or absence of oil particles.

    a. N- series filters shall only be used for non-oil solid and water based aerosols or fumes.

    b. R- and P-series filters shall be used when oil aerosols or fumes (i.e., lubricants, cutting fluids, glycerin, etc.) are present. The R-series filters are oil resistant and the P-series filters are oil proof.

    c. Follow filter manufacture recommendations.

3. If a vapor hazard exists, use an organic vapor cartridge in combination with the high efficiency filter.

H. Historical airborne fiber level data may serve as the basis for selection of the level of respiratory protection to be used for an abatement task. Historical data provided by the Contractor shall be based on personal air monitoring performed during work operations closely resembling the processes, type of material, control methods, work practices, and environmental conditions present at the site. The Owner and/or Testing Laboratory may request documentation of aforementioned results for review. This will not relieve the Contractor from providing personal air monitoring to determine the time-weighted average (TWA) for the work under contract. The TWA shall be determined in accordance with 29 CFR 1926.1101.

I. At no time during actual removal operations shall half-mask air purifying respirators be allowed unless a full 8-hour TWA and excursion limit have been conducted. Use of single use dust respirators is prohibited for the above respiratory protection.

J. Contractor shall ensure that the workers are qualitatively or quantitatively fit tested by an Industrial Hygienist initially and every 12 months thereafter with the type of respirator he/she will be using.

K. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.

L. No facial hairs (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask-to-face seal.

M. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by Contractor at Contractor's expense.

N. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:

1. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134 (b); and

2. High efficiency filters for negative pressure respirators shall be changed after each shower; and

3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated in Section 3.03 and/or 3.04.

4. Airline respirators with high efficiency filtered disconnect shall be

disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturers recommendations; and

5. Respirators shall be stored in a dry place and in such a manner that the face piece and exhalation valves are not distorted; and

6. Organic solvents shall not be used for washing of respirators.

O. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the Work Area. Qualitative fit test shall be done to ensure proper fit of respirator.

1.22 PROTECTIVE CLOTHING

A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. Provide to all workers, foremen, superintendents, authorized visitors and inspectors, protective disposable clothing consisting of full-body coveralls, head covers, gloves and 18-inch high boot type covers or reusable footwear.

B. In addition to personal protective equipment for workers, the Contractor shall make available at each worksite at least six (6) additional uniforms and required respiratory equipment each day for personnel who are authorized to inspect the work site. He/she shall also provide, for the duration of the work at any site involving a decontamination unit for worksite access, a lockable storage locker for use by the Owner. In addition to respiratory masks for workers, the Contractor must have on hand at the beginning of each workday, at least six (6) masks each with two sets of fresh filters, for use by personnel who are authorized to inspect the worksite. The Contractor shall document the qualifications of personnel authorized to enter the Work Area.

C. Asbestos handlers involved in remote tent procedures shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment and shall follow procedures defined in the Variance Decisions and conditions for the project.

D. Coveralls: provide disposable full-body coveralls and disposable head covers. Require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes for all workers in the Work Area.

E. Boots: provide work boots with non-skid soles and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Paint uppers of all boots yellow with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason after being contaminated.

F. Hard Hats: provide hard hats as required by OSHA for all workers, and provide a minimum of four spares for Inspectors, visitors, etc. Label all hats with same warning label as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may cause potential head injury. Provide hard hats of the type with polyethylene strap suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean and decontaminate and bag hard hats prior to removing them from the Work Area at the end of the work.

G. Goggles: provide eye protection (goggles) as required by OSHA for all workers involved in any activity that may potentially cause eye injury. Require them to be worn at all times during these activities. Thoroughly clean and decontaminate goggles before removing them from the Work Area.

H. Gloves: provide work gloves to all workers, of the type dictated by the Work and OSHA Standards. Do not remove gloves from the Work Area. Dispose of as contaminated waste at the end of the work. Gloves shall be worn at all times.

I. Reusable non-porous footwear, hard hats and eye protection devices shall be decontaminated or properly stored in the contaminated Equipment Room until the end of the Abatement Work.

J. Disposable protective clothing shall be discarded and disposed of every time the wearer exits from the workspace to the outside through the decontamination facility.

K. Respirators, disposable coveralls, headcovers and footcovers shall be provided by Contractor for Owner and any other authorized representative who may inspect the Work Area.

1.23 OSHA AIR MONITORING

A. Contractor shall employ an OSHA Competent Person to take and submit for Laboratory analysis air samples in accordance with OSHA Regulations per the Deconstruction Plan HASP. All costs for this work shall be included in the Bid Price.

B. The Laboratory shall be a current proficient participant in the American Industrial Hygiene Association (AIHA) PAT Program. The laboratory identification number shall be submitted and approved by the Owner. The laboratory shall be accredited by the AIHA and New York State Department of Health Environmental Laboratory Approval Program (ELAP).

C. The Laboratory shall also be a current proficient participant in the NIST/NVLAP Quality Assurance Program for the identification of bulk samples. Laboratory identification number shall be submitted to and approved by the Owner.

D. Contractor shall require a competent person to perform the following functions

and to be on-site continuously for the duration of the project:

1. Monitor the set up of the Work Area enclosure and ensure its integrity.

2. Control entry and exit into the work enclosure.

3. Ensure that employees are adequately trained in the use of engineering controls, proper work practices, proper personal protective equipment and in decontamination procedures.

4. Insure that employees use proper engineering controls, proper work practices, proper personal protective equipment and proper decontamination procedures.

5. Competent person shall check for rips and tears in work suits, and ensure that they are mended immediately or replaced.

E. Contractor shall submit to the Owner all credentials of the designated OSHA competent person and Laboratory for approval.

F. Continuous (daily or per shift) monitoring and inspection will include personnel samples from the breathing zone of workers to accurately determine the employees' occupational exposure to contaminants.

G. Sampling and analysis methods shall be per the HASP.

H. Test Reports:

1. Promptly process and distribute one copy of the test results to the Owner.

2. Prompt reports are necessary so that if required, modifications to work methods and/or practices may be implemented as soon as possible.

3. Contractor shall by facsimile or e-mail notify the Owner within 24 hours of the results of each test, followed by written notification within three days.

I. Competent person shall conduct inspections and provide written reports daily. Inspections will include checking the standard operating procedures, engineering control systems, respiratory protection and decontamination systems, packaging and disposal of asbestos waste, and any other aspects of the project that may affect the health and safety of the people and environment.

J. The Owner reserves the right to conduct air and surface dust sampling in conjunction with and separate from the Competent Person for the purposes of Quality Assurance.

K. All samples shall be accompanied by a Chain of Custody Record that shall be

submitted to the Owner upon completion of analysis.

1.24 TAMPERING WITH TEST EQUIPMENT

All parties to this Contract are hereby notified that any tampering with testing equipment will be considered an attempt at falsifying reports and records to federal and state agencies and each offense will be prosecuted under applicable state and federal criminal codes to the fullest extent possible.

1.25 GUARANTEE

A. Work performed in compliance with this Contract shall be guaranteed for a period of one year from the date the completed work is accepted by the Owner.

B. The Contractor shall not be held liable for the guarantee where the repair required under the guarantee is a result of obvious abuse or vandalism, as determined by the Owner.

C. The Owner will notify the Contractor in writing regarding defects in work under the guarantee.

PART 2 – PRODUCTS

2.1 MATERIAL HANDLING

A. Deliver all materials to the job site in their manufacturer's original container, with the manufacturer's label intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.

2. Store all materials on pallets, away from any damp and/or wet surface. Cover materials in order to prevent damage and/or contamination.

3. Promptly remove damaged materials and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Owner may reject as non-complying such material and products that do not bear identification satisfactory to the Owner as to manufacturer, grade, quality and other pertinent information.

2.2 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 Phase I 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 shall 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. 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.

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

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

H. 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.

I. 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.

J. 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).

K. 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 and as required by Legal Requirements. 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 Legal Requirements.

L. 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

M. Wetting agents: (Surfactant) 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 applied according to the manufacturer's written instructions.

N. Encapsulants (Sealants, Lockdown Encapsulants): Encapsulants shall consist of pigmented (non-transparent) liquid material which can be applied to asbestos containing materials or bare surfaces exposed after an abatement which temporarily controls the possible release of asbestos fibers from the material or surface either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant). If used, the encapsulant shall be installed according to the

manufacturer's written instructions. Sealing materials to be applied to structural members and decking assemblies scheduled to receive spray-applied fireproofing shall be approved by UL for use with the specified material. Encapsulants may only be used as permitted by Legal Requirements, including all Variances.

O. Framing Materials and Doors: As required to construct temporary decontamination facilities and isolation barriers. Lumber shall be high grade, new, finished one side.

P. Fire Retardant Reinforced Polyethylene Sheeting: For covering floor of decontamination units, provide translucent, nylon reinforced or woven polyethylene laminated, fire retardant polyethylene sheeting. Provide largest size possible to minimize seams, minimum uniform thickness 6-mil.

Q. Drums: Asbestos-transporting drums, sealable and clearly marked with warning labels as required by OSHA and EPA.

R. Polyethylene Disposal Bags: Asbestos disposal bags, minimum of 6-mil thick. Bags shall be clearly marked with warning labels as required by OSHA and EPA.

S. Waste Container Bag Liners and Flexible Trailer Trays: One piece leak-resistant flexible tray with absorbent pad.

T. Tape: Provide tape that is of high quality with an adhesive that is formulated to aggressively stick to sheet polyethylene.

U. Flexible Duct: Spiral reinforced flex duct for air filtration devices.

V. 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. Protective clothing shall conform to OSHA Standard 29 CFR 1926.1101.

2.3 TOOLS AND EQUIPMENT

All equipment provided shall conform to applicable federal and state regulations, local codes and the requirements specified herein.

A. Communication Equipment: Devices suitable for inter-room communications such as "walkie-talkies" or "radio band" communicators shall be provided.

B. 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.

C. 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.

D. 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.

E. Water Filtration System: A system capable of filtering and retaining particles larger than 5.0 microns in size shall be provided.

F. 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.

G. Air Filtration Device (AFD): AFDs shall be equipped with High Efficiency Particulate Air (HEPA) filtration systems and shall be approved by and listed with Underwriter's Laboratory.

H. Scaffolding: All scaffolding shall be designed and constructed in accordance with OSHA (29 CFR 1926/1910), New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable. All scaffolding and components shall be capable of supporting without failure a minimum of four times the maximum intended load, plus an allowance for impact. All scaffolding and staging must be certified in writing by a Professional Engineer licensed to practice in the State of New York.

1. Equip rungs of all metal ladders, etc., with an abrasive, non-slip surface.

2. Provide non-skid surface on all scaffold surfaces subject to foot traffic. Scaffold ends and joints shall be sealed with tape to prevent penetration of asbestos fibers.

I. Transportation Equipment: Transportation Equipment, as required, shall be suitable for loading, temporary storage, transit and unloading of contaminated waste without exposure to persons or property. Any temporary storage containers positioned outside the building for temporary storage shall be metal, closed and locked.

J. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems.

K. Vacuum Attachments: Soft Brush Attachment, Asbestos Scraper Tool, Drill Dust Control Kit.

L. Electric Sprayer: An electric airless sprayer suitable for application of encapsulating material and shall be approved by and listed with Underwriters Laboratory.

M. Water Sprayer: The water sprayer shall be an airless or other low-pressure sprayer for amended water application.

N. Water Atomizer: Powered air-misting device equipped with a ground fault interrupter and equipped to operate continuously.

O. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use due to their potential to shred asbestos fibers into small, fine fibers. Wire brushes maybe used for cleaning pipe joints within glove-bags upon written approval of the Owner.

P. Hand Power Tools: shall be equipped with HEPA-filtered local exhaust ventilation if used to drill, cut into or otherwise disturb ACM.

Q. Other Tools and Equipment: Contractor shall provide other suitable tools for the stripping, removal, encapsulation, and disposal activities including but not limited to: hand-held scrapers, sponges, rounded-edge shovels, brooms, and carts.

R. Fans and Leaf Blower: Provide Leaf Blower (one leaf blower per floor) and one 20-inch diameter fans for each 10,000 cubic feet of Work Area volume to be used for aggressive sampling technique for clearance air testing.

S. Fire Extinguishers: Provide type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other areas, provide type "ABC" dry chemical extinguishers of NFPA recommended types for the exposure in each case. All fire extinguishers shall comply with the applicable recommendations of NFPA Standard 10, "Standard For Portable Extinguishers." Provide a minimum of four fire extinguishers in each Work Area; one in the equipment room of the decontamination unit, one outside the Work Area in the clean room or directly outside same, and two fire extinguishers where they are most effective for their intended purpose. Do not exceed seventy-five feet between fire extinguishers within the Work Area.

T. First Aid Kits: Contractor shall maintain adequately stocked first aid kits in the clean rooms of the decontamination units and within Work Areas. The first aid kit shall be approved by a licensed physician for the work to be performed under this Contract.

2.4 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 Abatement Subcontractor shall be solely responsible for providing adequate respiratory protection for his workers at all times. 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 Abatement Subcontractor shall provide a level of respiratory protection that results in exposures below all applicable permissible exposure limits.

2.5 NEGATIVE PRESSURE FILTRATION SYSTEM

A. The Abatement Subcontractor shall 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 shall 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.

B. Preliminary calculations, based on four (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.

C. One (1) additional bank of five (5) negative exhaust air units shall 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 shall be shut down, the units and filters inspected, repaired/changed out as necessary, and then put back into service. Each of those five units shall 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) shall be taken out of service and removed from the work area for appropriate repair.

D. 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.

E. The HEPA filtration ventilation units shall 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 shall extend outside the window and window portal a distance of approximately one (1) foot or less.

a. Abatement Subcontractor shall 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:

4. Locate a continuous rubber gasket between the filter and the filter housing to form a tight seal.

5. 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.

6. 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.

c. 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.

d. 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 unit malfunction.

e. 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).

f. 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.

F. Use of System During Abatement Operations

a. Exhaust units shall be started before beginning commencing Phase I Abatement clean-up work. 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.

b. Do not shut down negative air system during abatement operations procedures unless authorized by the Environmental Consultant Project Monitor.

c. To the extent practical, start abatement work at a location furthest from the decontamination units and proceed toward them.

d. 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.

e. 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 shall be required to run after decontamination and during final air sampling until final air clearance testing and inspections are completed.

G. 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.

2.6 CLEANING

A. Throughout the construction period, the Contractor shall maintain the building as described in this Section.

a. The Contractor shall prevent building areas other than the Work Area from becoming contaminated. Should areas outside the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the Contractor's work practices, the Contractor shall be responsible for cleaning these areas in accordance with the procedures set forth in NYSDOL ICR56. All costs incurred in cleaning or otherwise decontaminating non-Work Areas and the contents thereof shall be borne by the Contractor at no additional cost to the Owner.

b. The Contractor shall provide to all personnel and laborers the required

equipment and materials needed to maintain the specified standard of cleanliness.

B. General

1. Waste water from asbestos removal operations, including shower water, may be discharged into the public sewer system only after approved filtration is in operation to remove asbestos fibers.

2. Asbestos wastes shall be double bagged in six mil (.006") polyethylene bags approved for ACM disposal and shall be properly labeled and handled before disposal.

3. The Contractor shall use corrugated cartons or drums for disposal of asbestos-containing waste having sharp edged components (e.g. nails, screws, metal lathe and tin sheeting) that may tear polyethylene bags and sheeting. The waste within the drums or cartons must be double bagged.

4. The Contractor shall transport all bags of waste to disposal site in thirty gallon capacity metal or fiber drums with tight lids, or in locked steel dumpster.

5. Dumping of debris, waste or bagged waste will not be permitted.

6. Cleanup of visible accumulations of loose ACM shall occur whenever there is a sufficient amount to fill a single asbestos bag.

7. ACM shall be collected utilizing rubber dust pans and rubber squeegees.

8. HEPA vacuums shall not be used on wet materials unless specifically designed for that purpose.

9. Metal shovels shall not be used within the work area.

10. Accumulations of dust shall be cleaned off all surfaces of the Work Area daily.

11. Mastic solvent when used will be applied in moderation (e.g. by airless sprayer). Saturation of the concrete floor with mastic solvent must be avoided.

12. The Contractor shall retain all items in the storage area in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of all materials.

13. The Contractor shall not allow accumulation of scrap, debris, waste material, and other items not required for use in this work. When asbestos contaminated waste must be kept on the work site overnight or longer, it

shall be double bagged and stored in accordance with New York City Department of Sanitation (NYCDOS) regulation Title 16 Chapter 8, and Federal, State and City laws.

14. Daily and more often, if necessary, the Contractor shall inspect the Work Areas and adjoining spaces, and pick up all scrap, debris, and waste material.

15. The Contractor shall maintain the site in a neat and orderly condition at all times.

PART 3 – EXECUTION

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 Legal Requirements including NYSDOL Variance Decision File Numbers 04-1432 and 05-0427 (attached) and associated conditions as well as Variance clarifications and Phase II Variance Petitions (attached). If conflicts exist between these Specifications and NYSDOL Site-specific Variance Decisions, Contractor shall promptly notify the LMDC and follow the requirements of the Site Specific Variance Decisions. In the event of any conflict in the requirements imposed by the Contract Documents and/or by any Legal Requirements, Contractor promptly shall notify LMDC of the conflict and LMDC shall determine, in its sole and exclusive discretion, which requirements are most stringent and Contractor shall comply with LMDC's determination.

A. Contractor shall be responsible for the proper removal of ACM from the Work Area using standard industry techniques allowed by codes and regulations. The Testing Laboratory representative shall observe the Work.

1. General Requirements

a) Removal of ACM shall be performed using wet methods. Dry removal of ACM is prohibited.

b) Spray ACM with amended water with sufficient frequency and quantity to enhance penetration. Sufficient time shall be allowed for amended water to penetrate the material to the substrate prior to removal. All ACM shall be thoroughly wetted on all sides while work is being conducted.

c) Accumulation of standing water on the floor of the Work Area is

prohibited.

d) Apply removal encapsulants, when used, in accordance with the manufacturer's recommendations and guidelines. Encapsulants may only be used as permitted by the Variances.

e) Containerize ACM immediately upon detachment from the substrate. Alternately, ACM may be dropped in to a flexible catch basin and promptly bagged. Excess air within the bag shall be removed before sealing. ACM shall not be dropped from a height of greater than 10 feet. Above 10 feet, dust free inclined chutes may be used. Maximum inclination from horizontal shall be 60-degrees for all chutes.

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

g) 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.

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

i) 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.

2. Pre-Removal Procedures:

a) Prior to commencement of abatement activities, the Contractor shall notify the Environmental Consultant Project Monitor and request a pre-removal inspection. Posting of warning signs, building of decontamination enclosure systems, and all other preparatory steps shall have been taken prior to notification of the Environmental Consultant Project Monitor.

b) Contractor shall correct any deficiencies observed by Environmental Consultant Project Monitor at no additional cost to Owner.

c) Following the Environmental Consultant Project Monitor approval of the Work Area preparations, abatement activities may commence.

d) Prior to commencement of work, all personnel who are to enter the work area shall be instructed in and shall be knowledgeable of the appropriate

procedures for personnel protection and abatement. On-site training in the use of equipment and facilities unique to this job site shall be performed. Emergency evacuation procedures from the work area shall also be included in worker training.

3. Final Barrier Removal

a) Upon receipt of acceptable clearance testing results Isolation Barriers shall be removed and disposed accordingly as asbestos waste, at a minimum.

b) The area surrounding the abatement work place shall be cleaned of any visible debris utilizing HEPA-vacuum and wet methods.

c) The Environmental Project Monitor will conduct final visual. Approval must be granted prior to break down of decontamination facility and contractor demobilization. Extra time required to clean Work Areas in order to achieve clearance criteria shall not be considered grounds for an extension of time for contract completion.

4. Maintenance of Contained Work Area and Decontamination Enclosure Systems

a) Ensure that barriers are installed in a manner appropriate to the expected weather conditions expected during the project and for its duration. Repair damaged barriers and remedy defects immediately upon their discovery. Visually inspect barriers at the beginning and end of each work period.

b) Visually inspect non-Work Areas and the decontamination enclosure system for water leakage. Check the floor below, ceiling and walls, and view beneath/or around the decontamination enclosure system, for signs of leakage. Perform the visual inspection a minimum of two times for each 8-hour work shift.

3.1 ESTABLISHING PERSONNEL DECONTAMINATION ENCLOSURE SYSTEMS

A**.** Remote Personnel Decontamination Enclosure System

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

a. Netting removal;
b. Exterior façade cleanup;
c. Exterior fireproofing removals;
d. Scaffold tie-ins, hoist tie-in installation, and crane tie-ins;

e. 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
f. Creating waste decon access openings.

B. 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.

C. Personnel shall don appropriate personal protective equipment ("PPE") in the remote decon.

3.2 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.

A. 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.

B. 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").

C. 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.

D. 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.

3.3 ATTACHED PERSONNEL DECONTAMINATION ENCLOSURE SYSTEM

1. 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 shall 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 shall be addressed using a remote decon as previously discussed.

3.4 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 shall be addressed using a remote decon. The following entry/exit procedures shall be used for removal using attached decon:

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

b. 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.

c. 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.

d. 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.

e. 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.

f. 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.

3.5 ESTABLISHING WASTE DECONTAMINATION ENCLOSURE SYSTEM

A. All ACM shall 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.

B. The interior 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.

C. All removed ACM and asbestos contaminated materials must be packaged at the time of removal. No removed ACM will remain unpackaged at the end of the work day.

D. 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).

E. 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).

F. 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.

G. 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 shall 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 3.16.

3.6 INSTALLATION OF ISOLATION BARRIERS

A. 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 shall 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 shall 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 shall be sealed from the Building interior using two layers of 6-mil poly and tape.

B. 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.

3.7 MAINTENANCE OF DECONTAMINATION ENCLOSURE FACILITIES AND BARRIERS

The following procedures shall be followed during the conduct of abatement activities.

A. All polyethylene barriers inside the work place and partitions constructed to isolate the Work Area from occupied areas shall be inspected by the asbestos handler supervisor at least twice per shift.

B. Smoke tubes shall be used to test the integrity of the Work Area barriers and the decontamination enclosure systems daily before abatement activity begins and at the end of each shift.

C. Damage and defects in the decontamination enclosure system shall be repaired immediately upon discovery.

D. At any time during the abatement activity, if visible emissions are observed, or elevated asbestos fiber counts outside the Work Area are measured, or if damage occurs to barriers, abatement within the affected Work Area shall stop. The source of the contamination shall be located, the integrity of the barriers shall be restored, and visible residue shall be cleaned up using appropriate HEPA-vacuuming and wet cleaning.

E. Inspections and observations shall be documented in the daily project log by the asbestos handler supervisor.

3.8 LOCKOUT OF HVAC SYSTEMS AND ELECTRIC POWER

Prior to the start of any prep work, the Contractor shall employ skilled tradesmen with appropriate asbestos licenses for the following work. All work shall comply with the OSHA Electrical Safety and Lock-out and Tag-out regulations.

A. Disable all ventilating systems or other systems bringing air into or exhausting air out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means to ensure against accidental re-starting of equipment.

B. Lockout power to the Work Area by switching off all breakers and removing them from panels or by switching and locking entire panel. Label panel with following notation: “DANGER CIRCUIT BEING WORKED ON”.

C. Lock out power to circuits running through Work Area whenever possible by switching off and removing breakers from panel. Protect all conduit and wires to remain and label all active circuits at intervals not to exceed 3 feet with tags having the following notation: “DANGER LIVE ELECTROCUTION HAZARD”. Label all circuits in all locations including hidden locations that may be affected by the work in a similar manner.

3.9 ESTABLISHING A NEGATIVE PRESSURE CONTAINMENT

A. 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.

B. 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.

C. 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 shall be shut down, the units and filters inspected, repaired/changed out as necessary, and then put back into service. Each of those five units shall 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) shall be taken out of service and removed from the work area for appropriate repair.

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

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

1. The window pane will be secured from the interior and cut along the interior framing.

2. The window will be angled and brought into the work area and either cleaned of settled dust or disposed of as an asbestos waste.

3. 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.

F. 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 shall occur prior to manifold installation activities. Visible gross debris, existing on interior and exterior window surfaces that will be impacted by installation of negative ventilation units/manifolds will be wetted and placed directly into a disposal container. All impacted 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.

G. Exhaust duct hose shall 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.

H. 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 manufacturer equipped with HEPA filtered local exhaust ventilation.

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

Non-contaminated make-up air shall 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' shall 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.

3.10 PRE-CLEANING

A. 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.

B. 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 shall 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.

C. 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 shall be performed within a HEPA-filtered negative pressure enclosure during subsequent Phase I abatement activities.

3.11 ESTABLISHING WORK AREAS

A. 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).

B. 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 shall be performed in conformance with ICR 56-11.1(e).

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

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

A. Interior Negative Pressure Tent Enclosures shall 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.

B. 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.

C. 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.

D. 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.

E. Personnel exiting the Negative Pressure Tent Enclosure shall proceed through the contaminated portion of the building to the remote personnel decon.

F. 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.

G. Clearance air sampling inside the tent, per 05-0427 Variance Decision, shall 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.

H. 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.

I. Personnel entering the interior tent enclosures from a contaminated area shall proceed as follows:

1. Upon entering the attached airlock, personnel shall remove the outer layer of protective clothing.

2. The exterior surface of the respirator shall be wet-wiped or HEPA vacuumed.

3. The opening to the exterior (if required) can then be established within the tent.

4. 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 (ACM-containing Column Covers and Fascia)

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.

3.13 MOVEMENT OF PERSONNEL

A. 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 shall enter the active abatement areas from the attached personnel decon established on the cleaned floor(s) above. Transport of workers shall be through the use of an exterior hoist or cleaned interior vertical shaft. Abatement personnel shall enter the personnel decon and shall don PPE prior to entering work area.

B. 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".

C. 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.

D. 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

1) 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 shall 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 shall be provided from non-contaminated areas above or below the vertical shaft, as practicable.

2) Upon successful completion of clearance air sampling, the cleaned vertical shafts shall 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' shall 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 shall 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.

3) 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.

4) Waste Movement via Contaminated Interior Shafts is described in Subsection 3.16 Movement of Material and Waste.

5) Disassembly of Clean and Contaminated Interior Vertical Shafts is described in 3.15 Work Procedures.

3.14 SEQUENCE OF WORK

A. Negative air systems and isolation barrier installation shall be completed prior to bulk debris removal. All interior non-structural building materials shall 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.

B. Building materials shall be removed using the following general sequencing within each designated work area, as applicable. Removal of multiple types of ACM 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).

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

D. Transite panels shall be removed intact, to the extent feasible. As transite panels are removed, louvers shall be HEPA vacuumed and/or wet-wiped and isolation barriers installed. At no time shall greater than 64 square feet be open at any one time prior to installation of isolation barriers. Removal of exterior wall transite panels shall be performed in compliance with additional requirements in NYSDOL Variance Decision File Number 05-0427 (page 6 of 14 item 24).

3.15 WORK PROCEDURES

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

B. 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.

C. 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 shall be utilized within the containment, as required, to control water during cleaning activities. Waste water shall be contained within the active work area during pressure washing activities. A pressure washer may be used to assist in detail work area cleaning.

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

E. Floor tile and mastic shall be removed via the following work practices:

1) Floor tiles and mastic shall be periodically misted with amended water prior to, during and subsequent to removal.
2) Floor tiles shall be removed using manual methods only, to the extent practical.
3) Floor tiles shall be directly containerized for disposal.

4) Chemical mastic remover using manual methods and or a mechanical buffer may be used to remove gross residual mastic from areas.
5) Concrete staining or discoloration caused by absorption of liquefied petroleum based mastics shall 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.

F. ACBM pipe insulation shall be removed within an existing negative pressure work area and shall 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.

G. SOFP shall be removed within an existing negative pressure containment as follows:

1) 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;

2) If a pressure wash system is used for final cleaning, waste water shall be collected, filtered through a system with at least 5.0 micron particle size capability prior to discharge in accordance with all applicable regulations.

H. Walker Duct and raceways shall 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 shall be conducted by the Owner's representative. This work shall be done during the Asbestos Abatement Project under negative pressure.

Work to be performed shall include the following:

1) Removal of raceway/duct access plates, as necessary.

2) Removal of all wires and cables from the ducts/raceways.

3) Isolation of ducts, as required, to prevent cross contamination.

4) Cleaning of all East to West Raceways (approx 2" x 6") on all floors.

5) Cleaning of all Walker Ducts (1" x 4") on all floors.

6) Cleaning of all terminal drops to floor ducts which are part of the systems.

7) Removal of all dirt, dust, lint, etc., caused by cleaning process in areas affected by cleaning process.

8) Representative photographs shall be taken after cleaning.

I. ***Cleaning, Visual Inspection and Clearance Air Sampling shall be performed as follows:***

1) Cleaning shall be performed in accordance with the National Air Duct Cleaners Association Standards (NADCA) ACR 2005. All access shall be through existing 6" floor openings.

2) 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.

3) All areas shall be air washed using Scand Tech USA High Volume Nozzles or equivalent.

4) Air washing shall 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.

5) High volume Tornado Nozzles, or equivalent, shall 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.

6) 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.

7) HEPA Air Scrubbers up to 2000 CFM shall be used for make up air entering the duct systems.

8) Dislodged contaminants shall be collected in a HEPA filtration system. All dirt, duct, lint and other accumulations shall 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.

9) Following initial air washing, a visual inspection of the cleaned duct area shall be performed. As the cleaning work progresses and prior to duct access plate closure, the cleaned duct work area shall be inspected.

10) Video inspection equipment will be used to inspect cleaned duct areas (see attached example equipment). The camera lens shall be capable of focusing to 1" from surfaces. Inspection equipment shall be capable of inspecting ducts of a minimum 1" x 4" dimension up to an approximate distance of 20 meters from one access port.

11) All inspected areas shall be identified and representative photographs taken.

12) 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.

13) 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 to 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..

J. 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 shall 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.

K. ***Netting Removal***

1) Existing building netting shall be removed as scaffold is erected.

2) Access to the active work area on the scaffold shall 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 shall 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 shall 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 shall 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.

L. 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 shall 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 shall 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 shall 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 shall be conducted inside the tent, prior to tent removal.

M. ***Roof, Façade and General Exterior Area Clean-up***

The roof, building façade and exterior areas requiring general clean-up shall 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.

N. ***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

O. ***Rooftop Cooling Tower Transite and Caulking Materials***

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.

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.

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.

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).

All openings (including, but not limited to windows, doors, ducts, and grilles) on the roof level within twenty five (25) feet of the active abatement area shall be sealed with two (2) layers of at least six mil poly.

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.

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 shall be transferred from the ground level staging area to the transport container.

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.

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.

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.

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.

Air sampling and analysis shall be conducted, in each work area, according to the requirements of Subpart 56-17. An area sample shall 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.

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.

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.

P. ***Non-Friable Exterior ACBM Waste Consolidation Area***

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.

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

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.

Prior to being removed from the waste consolidation area, all waste shall 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 shall be transported from the waste consolidation area directly to the disposal container.

3.16 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 shall 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, although permitted 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 shall 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 shall 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 shall be either cleaned or removed during the abatement phase (Phase I) of the project. Fixed objects within the negative pressure work area shall be either cleaned or removed during the abatement phase (Phase I) of the project.

The majority of the large sheet metal and steel components shall be washed and decontaminated for release as clean salvage. Porous materials shall 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 shall 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 shall 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 shall 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 wet-methods or other dust suppression techniques.

Material Transport

Waste materials from the abatement project shall be wetted with amended water and placed into lined and covered bulk material containers staged within the active work area. Inclined chutes shall not be utilized for transfer of asbestos-containing or asbestos-contaminated waste from the asbestos project work areas. The containers may 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 shall be disconnected from the chute and sealed air and dust tight utilizing 6-mil poly and tape. The asbestos waste shall 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 shall be disconnected from the chute and sealed air and dust tight utilizing 6-mil poly and tape. The asbestos waste shall 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.

3.17 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:

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:

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.

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 staging area applicable to the specific waste stream or loaded directly onto a transport vehicle.

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.

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

3.18 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

a. 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.

b. 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.

c. 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.

d. 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.

e. 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 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 shall 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 shall be submitted to the Contractor for information verification.

2 The Abatement Subcontractor shall 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 shall 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 shall 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) shall be permitted.

4 At the completion of the Phase I deconstruction activities the Abatement Subcontractor shall 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 shall approve the project close out.

3.19 ON-GOING AIR MONITORING

1. The Environmental Consultant Project Monitor is responsible for the project area Air Monitoring. Daily reports shall 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 Legal Requirements.

2. 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).

3. During deconstruction, air monitoring outside of the Building shall 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

4. All pre-abatement, progress, and final clearance air monitoring shall be done in accordance with NYSDOL ICR 56 requirements, this plan, and any site specific variances.

5. 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.

6. 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.

7. 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 shall be stopped immediately within the impacted area and barriers inspected and repaired as necessary. Abatement methods shall be altered to reduce airborne fiber concentration(s) to the aforementioned level and work shall 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 shall 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 shall 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 shall 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, shall 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 shall also be used to access the air sampling port to facilitate negative air exhaust air sampling exterior to the building. The interior tent enclosure shall 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 shall be shut down, the units and filters inspected, repaired/changed out as necessary, and then put back into service. Each of those five units shall 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) shall be taken out of service and removed from the work area for appropriate repair.

3.20 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 shall 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' shall 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 shall apply:

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

2. All standing water shall be collected by HEPA vacuuming or mopping the area. All standing water shall be removed.

3. 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 1) the work area is visually clean of all dust and 2) satisfactory results of clearance air sampling are obtained for samples collected and analyzed in conformance with EPA-AHERA TEM protocols. Clearance air sampling shall be performed utilizing "aggressive" air sampling techniques as per ICR 56 17.2 (f). A minimum of five (5) air samples shall be collected and analyzed inside each work area. A minimum of five (5) asbestos air samples per floor shall be collected. The asbestos abatement clearance air sampling criteria will be deemed to have been met in a work area when all samples, collected and analyzed in accordance with AHERA TEM protocols, are less than 70 structures/mm^2. The work area must be re-cleaned and re-tested at no additional cost to the Owner until successful TEM 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 shall be deemed complete following receipt of successful TEM clearance air sample results, containments shall remain and the area shall 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 4 – ASBESTOS WASTE MANAGEMENT

4.01 ACM WASTE REQUIREMENTS

A. The Contractor shall comply with the requirements of this Specification, all provisions of Section 1 - Waste Management and Sampling Plan, and applicable Legal Requirements. The Contractor and all sub-Contractors are specifically alerted to the illegal practice of combining asbestos-containing waste (ACW) from one project with the ACW of other projects without using the services of a permitted waste transfer station as defined by 6 NYCRR Part 360 and 364. As part of the shop drawing submittals, the Contractor must submit for approval the proposed method of transportation and disposal that will be utilized to manage the ACW of this Contract. If a permitted transfer station is to be used, the cost shall be included in the Bid price. The Contractor must submit a waste manifest consistent with whatever approved method is utilized as part of the invoicing and payment procedures. The names/addresses/copies of licenses for transporters, transfer stations and landfills are to be submitted a minimum of 10 days prior to first use.

The Contractor shall maintain compliance with the strictest set of Legal Requirements of Title *15,* Chapter 1 of RCNY, NYC LL 70/85, NYS DOL ICR *56,* USEPA, Asbestos Regulation 40 CFR Section 61.152, 29 CFR 1926.1101, 29 CFR 1910.1200 (F) of OSHA's Hazard Communication Standards, and other applicable standards.

NOTE: Any penalties incurred for failure to comply with any of the above regulations shall be the sole responsibility of the Contractor.

B. When presenting ACW for storage at the generation site, the Contractor shall:

1. Wet down ACW in a manner sufficient to prevent all visible emissions of dust into the air.

2. Seal material in a leak tight container while wet.

3. Keep ACW separate from any other waste.

C. When presenting ACW for storage away from the site of generation, the Contractor shall:

1. Ensure that ACW has been properly packaged as per requirements above.

2. Examine the containers of ACW to ensure that there are no breaks in the containers and that no visible dust is being released into the air.

3. If examination reveals damage to a container of ACW the Contractor or person accepting the waste shall immediately wet down the ACW and repackage it into a clean leak tight container. The subsequent repackaging shall be the financial responsibility of the Contractor and occur at no extra cost to the Owner.

4. Keep ACW separate from any other waste.

D. When storing ACW — The Contractor shall:

1. Ensure that the ACW has been sufficiently wetted down in a tight container.

2. Re-wet and repackage any damaged containers.

3. Maintain at storage site an adequate supply of spare leak tight containers.

4. Maintain at storage site an adequate supply of amended water.

5. Keep ACW separate from any other waste.

6. Keep ACW in a secured, enclosed, and locked container.

7. If the Contractor has intention of storing a quantity of ACW greater than or equal to 50 cubic yards, the Contractor shall submit a written request and receive written approval from the Owner.

E. When presenting for transport, the Contractor shall:

1. Ensure that ACW has been sufficiently wetted down.

2. Examine the integrity of the container's airtight seal.

3. Re-wet and repackage any damaged containers.

4. Keep ACW separate from all other waste.

5. Ensure that a person transporting asbestos waste holds a valid permit issued pursuant to law.

6. Frequency of Waste Removal:

Properly packaged and labeled asbestos waste shall be removed from the site on a daily basis. Under no circumstance shall asbestos waste be stored on site without written approval from the Owner. The Waste Hauler and landfill shall be as indicated on the notifications to regulatory agencies.

F. Waste Load-out Through Equipment Decontamination Enclosure (Full Decontamination Facility): Place asbestos waste in disposal bags. Large items not able to fit into disposal bags shall be wrapped in one layer of 6-mil thick polyethylene sheeting. Clean outer covering of asbestos waste package by wet cleaning and/or HEPA-vacuuming in a designated part of the Work Area. Move wrapped asbestos waste to the equipment washroom, wet clean each bag or object and place it inside a second disposal bag, or a second layer of 6-mil polyethylene sheeting, as the item's physical characteristics demand. Air volume shall be minimized, and the bags or sheeting shall be sealed airtight with tape.

1. The clean containerized items shall be moved to the equipment decontamination enclosure holding area pending load-out to storage or disposal facilities.

2. Workers who have entered the equipment decontamination enclosure system from the uncontaminated non-Work Area shall perform load-out of containers from the decontamination enclosure holding area. Dress workers moving asbestos waste to storage or disposal facilities in clean overalls of a color different than from that of coveralls used in the Work Area. Ensure that workers do not enter from uncontaminated areas into the equipment washroom or the Work Area. Ensure that contaminated workers do not exit the Work Area through the equipment decontamination enclosure system.

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

4. Labeled ACM waste containers or bags shall not be used for non-ACM debris or trash. Any materials placed in labeled containers or bags, including those turned "inside-out", shall be handled and disposed of as ACM waste.

G. All asbestos materials, wastes, shower water, polyethylene, disposable equipment and supplies shall be disposed of as contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York Department of Environmental Conservation and New York City Department of Sanitation.

H. All asbestos materials shall be prepared for transportation in accordance with this specification and all applicable Federal, State, County and City Regulations. Contractor shall submit the following documentation:

1. EPA Generator's identification numbers which has been obtained from the EPA for all asbestos waste generated from the project.

2. Applicable State Waste Hauler license and registration numbers.

3. Federal Hazardous Materials Waste Hauler number.

4. Designated landfill EPA Permit numbers.

I. Prior to loading asbestos waste, the enclosed cargo areas (dumpster) shall be prepared as follows:

1. Clean via HEPA-vacuum and wet wipe techniques the enclosed cargo areas of all visible debris prior to preparing with polyethylene.

2. Line the cargo area with two layers of 6-mil polyethylene sheeting to prevent contamination from damaged or leaking containers. Floor sheeting shall be installed first and extend up the walls a minimum of 24-inches. Wall sheeting shall be overlapped and taped securely into place.

J. Asbestos-containing waste shall be placed on level surfaces in the cargo area of the dumpster and shall be packed tightly to prevent any shifting or tipping of the waste during transportation.

K. Asbestos-containing waste shall not be thrown into or dropped from the dumpster. All material shall be handled carefully to prevent rupture of the containers.

L. All personnel engaged in handling and loading of contaminated waste outside of the Work Area shall wear protective clothing. The disposable clothing shall include head, body and foot protection and color of clothing shall be different from abatement personnel in the Work Area. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters.

M. Contractor shall immediately clean debris or residue observed on containers or surfaces outside of the Work Area. Cleaning shall be via HEPA equipped wet/dry vacuums only.

N. All asbestos-containing waste shall be transported from the abatement site to the landfill by a registered Waste Hauler. When transporting ACW:

1. Ensure that the ACW has been sufficiently wetted down in a leak tight container.

2. Re-wet and repackage any damaged containers.

3. Maintain at storage site an adequate supply of spare leak tight containers.

4. Maintain at storage site an adequate supply of amended water.

5. Keep ACW separate from any other waste.

O. Keep ACW in a secured, enclosed, and locked container.

P. Waste transport documents shall conform to the requirements of the U.S.

Department of Transportation, Hazardous Materials Transportation Regulation, 49 CFR Part 173 and EPA 40 CFR 61.150 (d)(1)(2). Shipping documents shall be clearly marked with the required designation "RQ Asbestos". Contractor shall provide a copy of this document to the Owner.

Q. A uniform hazardous waste manifest shall be prepared by the Contractor and signed by the Contractor each time the Contractor ships a dumpster load of Asbestos-Containing Waste Material. The uniform hazardous waste manifest shall include the site of waste generation, the names and addresses of the Transporter, the Contractor, and the landfill operator with information on the type and number of asbestos-waste containers, time and date. Contractor shall provide the Owner with signed copies of the waste manifest before each departure.

R. The registered hazardous Waste Hauler shall transport asbestos-containing waste material from the abatement site directly to the specified disposal site. Waste Hauler shall not accept material from any other site when transporting asbestos-containing waste material from the abatement site. The Owner reserves the right to travel with Waste Hauler to the waste disposal site. No intermediate storage of waste material (i.e. warehouse) shall be permitted.

S. Application for payments shall not be processed unless all hazardous waste manifests generated to date have been received and reviewed by the Owner. At a minimum all executed waste manifests shall be received within 30 days of shipment off-site.

T. All asbestos materials, wastes, shower water, polyethylene, disposable equipment and supplies shall be disposed of as contaminated waste, in accordance with the EPA regulation (40 CFR, Section 61.150) and those requirements of the New York State Department of Environmental Conservation and the New York Department of Sanitation.

U. Contractor shall transport all sealed drums to a landfill disposal site approved by the Department of Environmental Conservation and the EPA. Transportation shall be performed by a New York State registered Waste Hauler. When presenting the ACW for disposal, the Contractor shall:

1. Ensure that waste container is properly labeled according to the National Emission Standard for Hazardous Air Pollutants (NESHAP); Asbestos Revision, 40 CFR, Part 61, Subpart M. The labels shall include the name of the waste generator and the location where the waste was generated.

2. Comply with all applicable orders issued pursuant to asbestos disposal.

3. Ensure that ACW has been sufficiently wetted down.

4. Re-wet and repackage any damaged containers.

5. Keep ACW separate from all other wastes.

V. Contractor shall notify the waste disposal site, at least 24 hours prior to transportation of contaminated waste to be delivered. Contractor shall determine if a larger notification period is required.

W. At the disposal site, Waste Hauler trucks shall approach the dump location as close as possible for unloading asbestos waste. Containers shall be carefully placed in the ground. Do not throw containers from truck.

X. Waste Hauler shall inspect containers as they are unloaded at the disposal site. Material in damaged containers shall be repacked in empty containers, as necessary.

Y. Waste Hauler shall not remove ACW from drums unless required to do so by the disposal site. Used drums shall be disposed of as asbestos-contaminated waste.

Z. Contractor shall ensure that personnel engaged in unloading of the containers at the waste site wear proper protective clothing. The disposable clothing shall include head, body and foot protection. Minimum respiratory protection shall be half face, dual cartridge, air purifying respirators with HEPA-filters. Workers shall remove their protective clothing at the disposal site, place it in labeled disposal bags and leave them with the deposited waste shipment.

AA. For the compaction operation, the Contractor shall ensure that disposal sites personnel have been provided with personal protective equipment by the disposal operator. If the disposal site has not provided this protective equipment, the Contractor shall supply protective clothing and respiratory protection for the duration of this operation (PAPR respirators are mandatory).

BB. If containers are broken or damaged, the Contractor or Waste Hauler shall, using personnel who are properly trained and wearing proper protective equipment, shall repackage the waste in properly labeled containers. Contractor shall then clean the entire truck and its contents using HEPA-vacuums and wet cleaning techniques until no visible residue is observed.

CC. Following the removal of all containerized waste, the Contractor shall decontaminate the truck cargo area using HEPA-vacuums and/or wet cleaning techniques until no residue is observed. All 6-mil polyethylene sheeting shall be removed and discarded as asbestos-containing waste material along with contaminated cleaning material and protective clothing, in containers at the disposal site.

DD. The Waste Hauler shall not back-haul any items on his return from landfill/disposal site.

EE. All asbestos waste shall be disposed of in an approved Asbestos Landfill site only.

FF. NO PERSON UNDER ANY CIRCUMSTANCES SHALL ABANDON ACW. Only certified persons in approved landfills shall dispose of ACW.

GG. A manifest form shall be signed by the Landfill documenting receipt and acceptance of the asbestos-containing waste. This manifest shall be furnished to Owner.

HH. It is the responsibility of the Asbestos Contractor to determine current waste handling, transportation and disposal regulations for the work site and for each waste disposal landfill. The Asbestos Contractor must comply fully with these regulations and all appropriate U.S. Department of Transportation, EPA and other Federal, State and Local entities' regulations and all other current legal requirements.

II. The Asbestos Contractor shall obtain an agreement from the Waste Hauler that the practice of "Back-Hauling" shall not be engaged in, with respect to any and all waste loads taken from this site during the work.

JJ. The Asbestos Contractor shall document actual disposal of the waste at the designated landfill by having completed a Disposal Certificate and shall provide a copy of the same to the Owner within 30 days of shipment.

END OF SECTION 02080