

130 Liberty Street Contractor's Implementation Plan for Decontamination and Deconstruction



Bovis
Lend Lease



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Revision 1.10

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Preface

This Contractor's Implementation Plan sets forth the decontamination and deconstruction procedures for the building located at 130 Liberty Street, New York, New York (the "Building"). The implementation plan was developed and is intended to meet the spirit and intent of the law by protecting workers and the general public from exposure to asbestos fibers and other contaminants of potential concern, both inside and outside the Building and in the vicinity of 130 Liberty Street in compliance with Contract Documents including the accepted Deconstruction Plan dated September 7, 2005 and the accepted February 6, 2008 Addendum thereto (the "Deconstruction Plan"). This implementation plan includes all the work necessary to completely decontaminate and deconstruct the Building.

The work described in this implementation plan has been designed to comply with the requirements of:

- The New York City Department of Buildings (NYCDOB or DOB) and all permits issued by NYCDOB
- The United States Environmental Protection Agency (USEPA)
- The New York City Department of Environmental Protection (NYCDEP)
- The New York State Department of Labor (NYSDOL), including Approved Variance Decision Files under File № 05-0427 including all approved re-opening requests, decision amendments, and clarifications of same.
- The Occupational Safety and Health Administration (OSHA)
- The Fire Department of New York (FDNY)
- The New York Police Department (NYPD)
- Citywide Office of Safety and Health (COSH)
- The Deconstruction Plan
- The Contract between the LMDC and Bovis, dated as of October 20, 2005, and
- Regulatory requirements and directives from various City Agencies.

The decontamination portion of the project is divided into two (2) components:

- a. Interior asbestos/environmental abatement
- b. Exterior asbestos/environmental abatement

Decontamination issues addressed within this implementation plan include:

1. Removal of ACM, friable and non friable, and porous materials, impacted by WTC dust, at a minimum, as asbestos waste, including, but not limited to:
 - a. Gypsum wallboard (except for Stairwell enclosures, as described in Section III.AB below).
 - b. Ceiling tiles.
 - c. Insulation materials.
 - d. Carpets.
 - e. Fireproofing (except for Stairwell fireproofing, as described in Section III.AB below).
 - f. Wood (except for remnant wood, as described in section III.AC below)
 - g. ACM existing in the Building *prior* to September 11, 2001.
 - h. All waste material shall be characterized and handled in accordance with the results of the September 7, 2005 Waste Sampling and Management Plan.
2. Removal of decontaminated nonporous material as conventional waste including, but not limited to:
 - a. Ducts.
 - b. Metal ceiling components.
 - c. Pipes, subject to the procedures and assumptions set forth in Sections III.L.3. and III.Q.
 - d. Raised floor systems.
 - e. Convection units and enclosures.

- f. Metal hardware cloth (wire mesh).
3. Abatement of mechanical shafts, including pipes (except those associated with the standpipe), ducts, risers and main trunk lines, as well as all associated HVAC equipment in mechanical rooms.
4. Cleaning and or removal of concrete slab floor cell systems.
5. Wipe down of exterior facade.
6. Removal of exterior aluminum column enclosures and associated aluminum fascia panels.
7. Removal of hazardous waste, universal waste and regulated waste identified within the Building.

I. Project Overview

A. General Building Information

1. The building, located at 130 Liberty Street, previously was a 40-level, steel frame curtain-wall office building that has been deconstructed down to the 26th floor (partial). As of the date hereof, floors 5 and below are considered contaminated, with the exception of certain areas of cellar A and all of cellar B.
2. Structural damage was sustained on the North face of the building as a result of the collapse of the World Trade Center on September 11, 2001. The damaged portion of the structure was repaired which included installing the necessary structural components required for the stability of the building.
3. The site is bounded by Liberty, Albany, Washington and Greenwich Streets.
4. Approximate building dimensions remaining are 182' x 182' x 365' in overall height, from grade elevation.
5. The approximate gross building floor area remaining is 890,000 square feet.
6. The building's exterior "skin" is a glass and aluminum curtain-wall, mechanically attached to the building's structure at each floor slab elevation.
7. Floor slabs are constructed with poured concrete slab over corrugated metal decking.
8. There is a full floor Mechanical Room that provided necessary HVAC, plumbing, electrical and other support services to the building during its operation partially decontaminated on the 5th floor.
9. Vertical transportation was configured with twenty-nine (29) existing building elevators divided into low, mid and high-rise banks now secured and out of service. The mid and high-rise elevator cars have been removed from the building.
10. Building floor designations used in this document and on the job site, shall represent structural floor designations. (The architectural "elevator button" floors did not have a 6th or 13th floor.)
11. Scaffolding installation has been completed by others around the building perimeter and includes a black mesh enclosure on the outboard side of the scaffold.
12. A dual car, personnel/material construction hoist is located on the North face of the building. This hoist provides access to a clean vestibule area on each unabated floor. Vestibule dimensions are approximately 26'x26'. The South Hoist is out of service.
13. Hardware cloth (1/4" spacing, wire nonporous metal mesh/screen) has been installed on the exterior side of some existing glass windows.
14. The fire of August 18th 2007 extensively damaged a large portion of the South facade of the building. Damage caused by the fire and/or incidental damage incurred in response to the fire include:
 - a. Damage to Aluminum Column covers on the South Side from floors 14 – 20.

- b. Damage to south side decons, vestibules, floor slabs and structural members in the south vestibule column bay from floors 14 - 20.
- c. Damage to the South Hoist tower, connection points and scaffolding components above the 14th floor.
- d. Removal of various windows by the FDNY to vent heat and smoke.

B. In order to allow decontamination work to resume in a safe manner, the following items were completed:

1. Removal of Aluminum Mullions which were irreparable from floors 14 - 20 as approved by the NYCDOB, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427.
2. Installation of shoring for the Compromised South Hoist Vestibule column bay slabs on floors 10 – 19; supporting floors 11 – 20 as approved by the NYCDOB, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427.
3. Repair of any scaffolding needed for exterior decontamination; and South Hoist components to the 14th floor, servicing as high as the 9th floor, as approved by the NYCDOB.
4. Enclosing of building consisting of metal studs and poly where windows and the south hoist doors were removed on floors 14 - 20 as approved by the NYCDOB, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427.
5. Restore the dry standpipe system including Siamese connections as per the Building Code. Additionally, a pressurized alarm has been installed on the dry standpipe system at ground level.
6. Construct new decontamination units out of fire resistant materials, as approved by the USEPA, NYSDOL, NYCDEP, NYCDOB and FDNY.
7. Conditions at existing decontamination units were addressed for fire safety, as approved by the NYCDOB and FDNY.
8. Fire loads in the building were reduced prior to the start of abatement, in accordance with variance 05-0427 Reopening and Deconstruction Plan Amendment Request as approved by the NYCDOB, NYSDOL, USEPA, NYCDEP.
9. The North façade of the building perimeter (“the gash”) was enclosed to facilitate the plywood interior gash removal to reduce the fire load in the building, in accordance with variance 05-0427 Reopening and Deconstruction Plan Amendment Request as approved by the NYCDOB, NYSDOL, USEPA, NYCDEP.
10. Removal of deconstruction debris from floors 25 and 26 using the tower crane as approved by NYCDOB.
11. Installation/repair of stair enclosures from Stairwells A and B to the 20th floor slab prior to the start of decontamination, as approved by the NYCDOB, FDNY, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427.
12. Installation of emergency egress to the exterior scaffolding, on the East and West elevations, on floors 2 – 25, for the use of emergency response personnel, as approved by the FDNY, NYCDOB, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427 Reopening and Deconstruction Plan Amendment Request.
13. Installation of negative air cutoff switches at a single location on the ground floor outside the building, capable of shutting down negative air units in an independent work area as approved by the FDNY, NYCDOB, NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427.
14. Floor layouts are provided to FDNY and NYCDOB, kept on site in a designated FDNY lockbox and updated as floor layouts change. In addition, these floor layouts and updates (as available) are provided to LMDC/LMCCC and URS.
15. A fire watch and fire guard in compliance with 3RCNY 11-01(c)(14)-(15) of the Rules of the City of New York for the duration of the project on a 24 hour, seven days per week basis, including when no work is being performed.

16. Smoking is strictly prohibited anywhere on the site and in the Building. The Contractor (Bovis) established and strictly enforces a non-smoking policy.
 17. Qualified on-site personnel who are familiar with the specifics of all building systems 24 hours per day, seven days per week. This representative has qualifications meeting those for Site Safety Managers or as approved by NYCDOB and FDNY.
 18. All Building electrical systems and equipment, including temporary wiring previously installed as well as new wiring, were inspected and certified per NYCDOB requirements by the licensed electrical subcontractor.
 19. Combustible materials which are not staged for immediate use in the Building are stored and secured in the "coin vault", which has a fire rated enclosure, with access available to FDNY, in accordance with FDNY requirements.
 20. The Contractor (Bovis) has total site safety responsibility and has a Site Safety Manager designated to oversee enforcement of all site safety requirements, including maintaining appropriate safety documentation. Site Safety Manager performs all required Building Code inspections during the abatement operation.
 21. The Contractor (Bovis) obtained NYCDOB permit allowing for a non-operational sprinkler system.
 22. The Contractor (Bovis) erected sidewalk sheds as required by NYCDOB.
 23. The written building Emergency Action Plan required under OSHA 29 CFR 1926.35 shall pertain to all conditions under the approved Deconstruction Plan, and shall make provisions both for employees and visitors. A copy of the approved Emergency Action Plan and any revisions, amendments or modifications shall be forwarded to NYPD, attention Commanding Officer, Operations Division. Free and unobstructed means of egress pursuant to 29 CFR 1926.34 are visible, marked and maintained free of obstructions.
 24. The independent environmental monitor performed visual inspections of all vestibule areas prior to re-establishment of decon units in these areas to confirm lack of dust, debris, or residue, and notified USEPA, NYSDOL, and NYCDEP of their findings and recommended actions.
- C. Environmental controls and procedures, identified in this plan shall, at a minimum, conform to the requirements of:
1. NYSDOL.
 2. NYCDEP.
 3. USEPA.
 4. OSHA
 5. The New York State Department of Environmental Conservation (NYSDEC).
 6. All Contract Documents, including the Deconstruction Plan.

Additionally, standard construction/deconstruction procedures shall be adhered to as required by NYCDOB, OSHA, NYCDOS, FDNY, etc.

D. Site Specific Variance 05-0427, approved by NYSDOL, shall be followed where those methods and procedures are used.

E. Necessary permits shall be obtained and notifications shall be filed with the appropriate agencies prior to starting those activities at the site.

Permits and Notifications required for this project shall include, *but not be limited to*, the following:

1. NYSDOL Asbestos Notification (DOS483).
2. NYCDEP Asbestos Project Notification (ACP7).

3. USEPA Asbestos Notification.
 4. NYCDOB Permits.
 5. NYCDOB Site Safety Plan.
 6. NYCDOB Cranes and Derricks permit to install and use tower crane.
 7. FDNY Permit to store air and gas at the site.
 8. FDNY Certificate of Fitness for Burners and Fire Guard for torch work operations.
 9. NYCDEP waste water discharge permit.
 10. NYCDOT Permits.
 11. Coordination with World Trade Center Site construction activities
- F. Utilities shall be disconnected and capped prior to decontamination, with the exception of temporary water, sewer and electric, which shall be maintained by the General Contractor (Bovis) during the decontamination process.
1. Existing vertical electric power riser shall be maintained within the building core to provide electricity for power within abatement work areas, emergency access lighting, etc. Power to the work areas shall comply with ICR 56, pertinent variance decisions, OSHA lockout tagout (LOTO) requirements and NYCDOB electrical codes. Live lines through abatement floors will be appropriately protected and marked.
 2. Each transformer will be framed out by wood studs, sheeted with nonflammable materials, protected by three (3) layers of 6mm fire-retardant polyethylene sheeting, and vented by continuously blowing an adequate volume of filtered makeup air into the enclosure for cooling purposes while energized. The enclosure will be inspected daily for enclosure integrity and functioning of the filtered makeup air. The transformers will be properly packaged and disposed of as asbestos waste following abatement at the appropriate time.
 3. Water risers and sanitary lines located within the core area shall be maintained for decon units. All drains will be sealed. The dry standpipe system shall not be used for abatement or demolition activities.
- G. Abatement of the Compromised South Hoist Vestibule column bay slabs from floors 15 - 20 as approved by the NYSDOL, USEPA, NYCDEP, in accordance with variance 05-0427, and removal of same per approval of NYCDOB has been completed.

II. Site Logistics

- A. A tower crane has been erected on the north side of the Building to assist the deconstruction phase of the project and for vertical transportation of material, equipment and waste. The tower crane will be maintained and inspected during decontamination as per the crane manufacturer's requirements and NYCDOB.
- B. A dual car exterior construction hoist shall be used to provide vertical transportation for material and personnel access. Existing building elevators have been secured and weights and cables have been removed.
- C. Waste shall be managed at the site in accordance with the Waste Storage and Management Plan and all required amendments incorporated in the Deconstruction Plan. We do not intend to store asbestos waste at the site. PCB waste, in addition to Hazardous and universal waste shall be staged at a location and in a manner approved by USEPA, NYSDOL, NYCDEP, NYCDOB and FDNY.

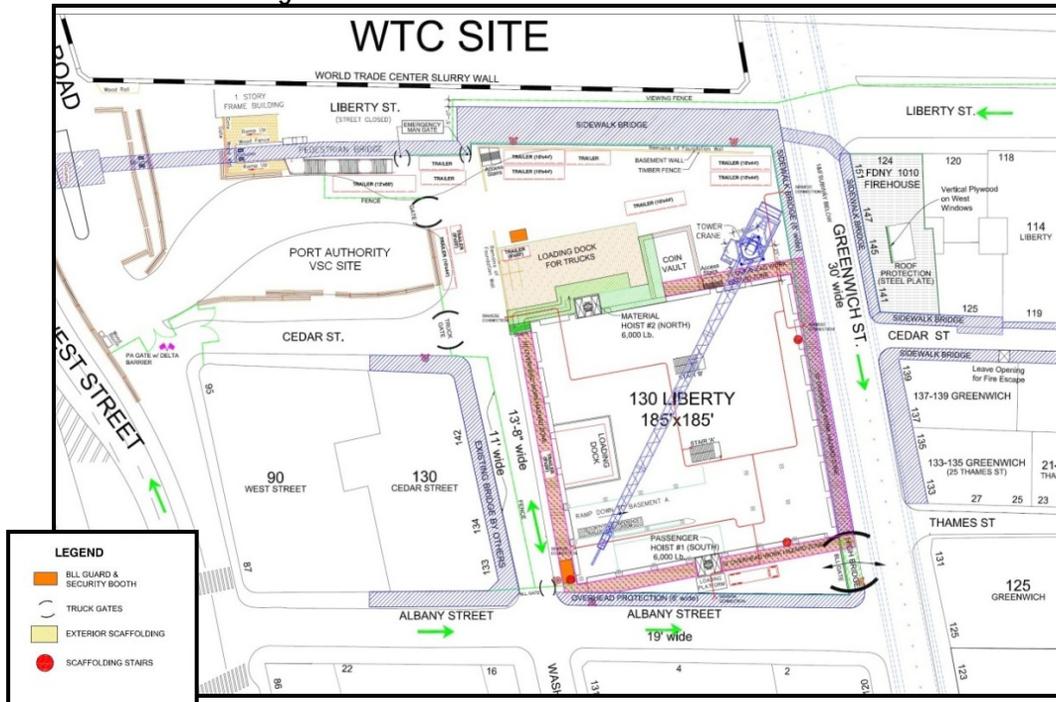
Asbestos waste may be temporarily staged within containment areas, in anticipation of daily loadout to transport vehicles. The magnitude of the temporary staging of Asbestos waste shall be determined by the materials and activities being performed at that location and shall vary significantly from one area to the next. Asbestos waste will not be stored in the building overnight. In the event that all asbestos waste cannot be loaded out, Bovis/LVI will notify FDNY. All waste generated within containment areas shall be removed from those areas prior to the commencement

of project monitor visual inspection and clearance air monitoring. At no time shall temporary waste storage containers obstruct work area exits or routes of egress, both routine and emergency. Waste storage shall comply with applicable regulatory requirements, including those restricting the duration of storage at the site.

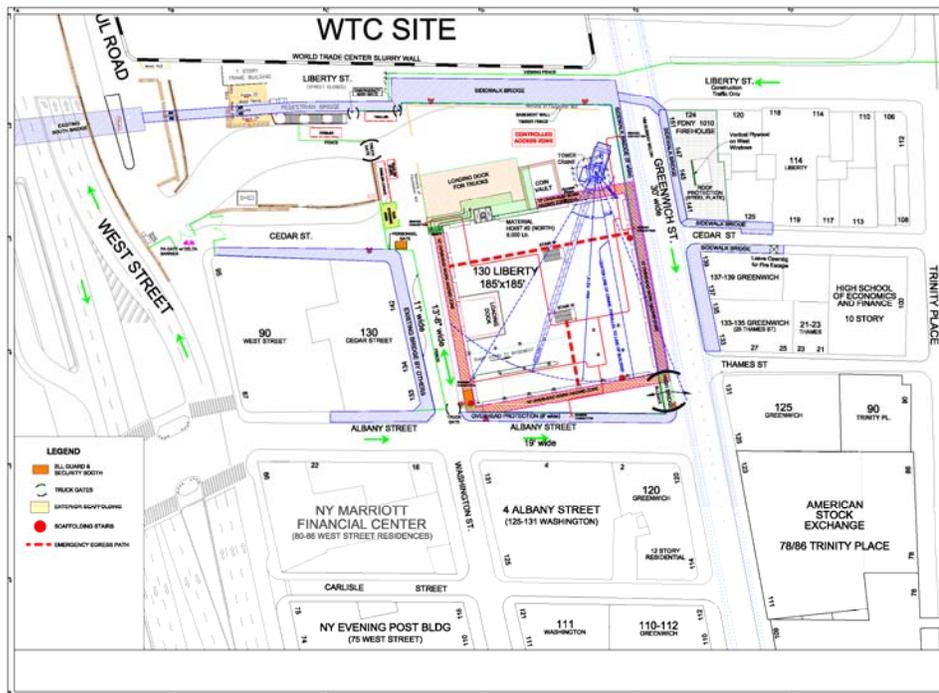
- D. A wheel wash station shall be used as necessary at the exit from the site.
1. The wheel wash shall be used to clean truck tires in the event that the truck passes over non-paved/protected areas. i.e.: dirt, gravel, sand, etc.
 2. The majority of asbestos waste generated at the site shall be transported from the building using 100-130cy trailers. The use of trailers will reduce vehicular traffic over the project duration, where smaller containers would require more trips through the surrounding neighborhoods.

E. Site logistics for decontamination and deconstruction may be adjusted from time to time based on site logistics plans of adjacent projects. Such adjustments shall be submitted to the appropriate agencies for review and acceptance.

Decontamination Site Logistics



Deconstruction Site Logistics



III. Environmental Abatement - Interior

A. General Procedures and Assumptions

1. Any disturbance of ACM or WTC debris/dust/residue shall be performed in a manner consistent with the requirements of Industrial Code Rule 56 (ICR 56), relevant site-specific variance decisions and relevant regulatory requirements.
2. Asbestos abatement and WTC dust removal work shall precede deconstruction, proceeding downward from the 19th floor.
3. Notwithstanding Section 2 above, the following activities may be performed out of sequence:
 - a. Façade removal, though it will not begin on a given floor until interior abatement is complete on that floor.
 - b. Abatement of Stairwells A and B enclosures.
 - c. 5th floor mechanical equipment room (MER)
 - d. 4th floor.
 - e. 3rd, 2nd and 1st floors, including entrance lobbies and loading dock.
 - f. Basement level A, to the extent not already decontaminated and cleared.

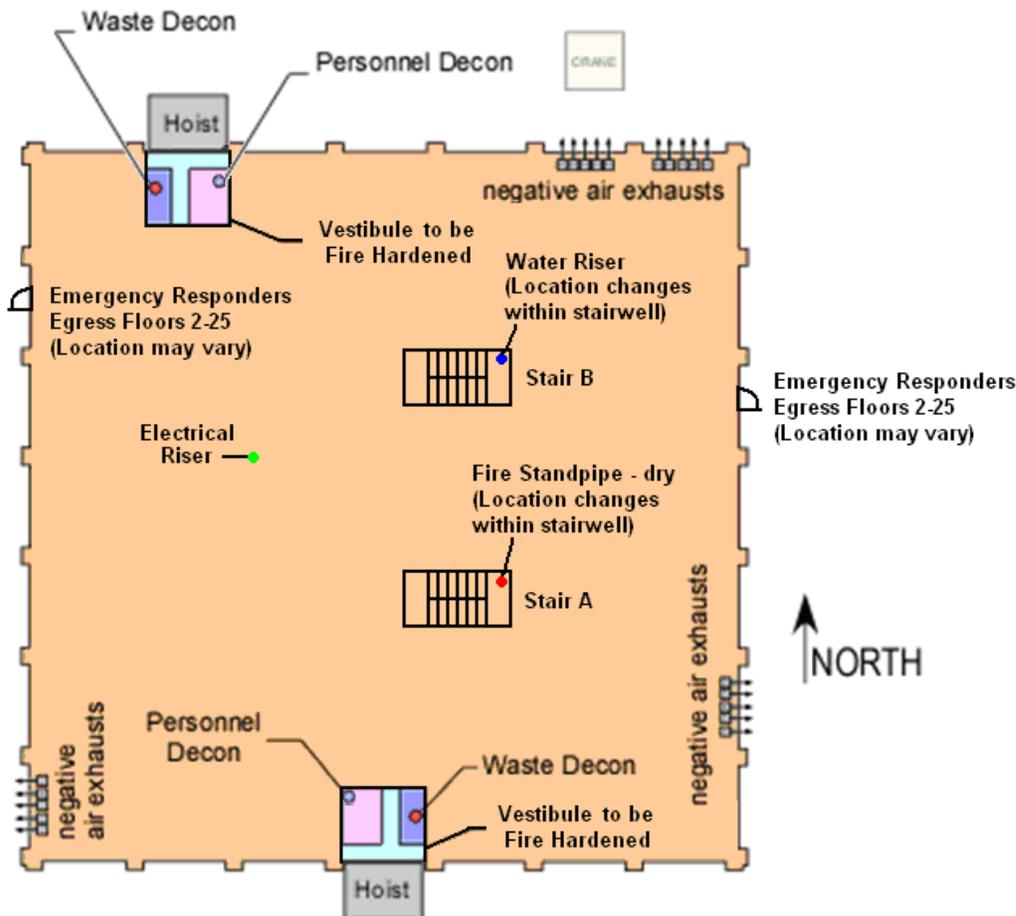
B. Abatement work areas have been established in the following floor groupings:

- a. Fine Cleaning Grouping 18-19
- b. Gross Removal Grouping 14-17
- c. Fine Cleaning Grouping 16-17
- d. Fine Cleaning Grouping 14-15
- e. Gross Removal Grouping 6-13
- f. Fine Cleaning Grouping 12-13
- g. Fine Cleaning Grouping 10-11
- h. Fine Cleaning Grouping 8-9
- i. Fine Cleaning Grouping 6-7
- j. Gross Removal Grouping 5
- k. Fine Cleaning Grouping 5
- l. Gross Removal Grouping 4
- m. Fine Cleaning Grouping 4
- n. Gross Removal Grouping 3-1
- o. Fine Cleaning Grouping 3-1
- p. Gross Removal Grouping Basement A
- q. Fine Cleaning Grouping Basement A

Following completion of gross removal each of the above Gross Removal Groupings will transition into a Fine Cleaning Grouping to complete the decontamination and clearance of each floor grouping.

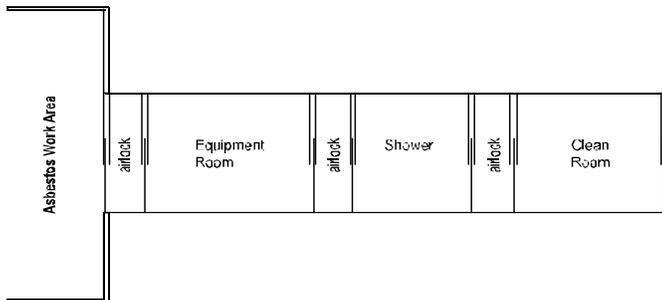
Deviations to this sequencing, as may be dictated by existing site conditions and established boundaries within the building shall be submitted to the LMDC, their consultants and the regulatory agencies, for review and acceptance.

- C. PCB and Asbestos waste, in addition to hazardous and universal wastes, will be handled in accordance with the approved Deconstruction Plan, including amendments.
 - a. Where PCB containing material, i.e., PCB caulking in the Cellar 'A' area has been identified, that material shall be demarcated by LVI Environmental Services personnel, with barrier tape, spray painting, or other means, to ensure that PCB and non-PCB waste streams are kept separate. This material shall be removed, as a separate activity, during abatement, within the containment. These materials shall be managed, handled, marked, stored and disposed of as PCB waste.
 - b. All other waste materials shall be handled in accordance with the Waste Storage and Transportation Plan.
- D. Decon units shall be located as needed on typical contained floors, as shown below.



Typical abatement floor layout

1. Personnel Decontamination Unit



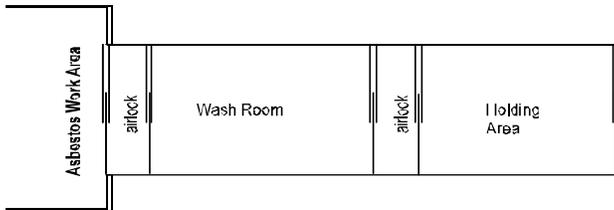
Schematic Drawing for reference only (Not to Scale)

- a. Personnel decontamination facilities to be constructed in accordance with NYCDOB, NY State ICR 56 regulatory and additional FDNY requirements consistent with the schematic above and submitted sketches on all abatement floors. Floors 1 – 19 North Vestibules, Floors 2 – 9 South Vestibules, Loading Dock West side.
- b. Decons shall be hardened to contain fire in a manner approved by the FDNY and NYCDOB.
- c. 1.5-hour fire rated self closing doors on each decon entrance and exit equipped with magnetic holds connected to heat detectors in the decon.
- d. Vestibules shall have a separate, clearly labeled FDNY Emergency bypass that provides direct access to the contained Work Area without going through the decon.
- e. A hard-wired heat detector, as reviewed by a licensed fire safety engineer and approved by NYCDOB, shall be installed in the clean room of the personnel decon areas.
- f. Proposed design of the decons will be reviewed and approved by USEPA, NYSDOL, NYCDEP, OSHA, NYCDOB, and FDNY prior to commencement of abatement work.
- g. Personnel decontamination facilities shall be built within hoist vestibules (except on the first floor and Basement A, where the facility will be built in the ground floor loading dock), not less than one per floor.

2. Waste & Equipment Decons

- a. Waste and Equipment Decon units to be constructed in accordance with NYCDOB, NY State ICR 56 regulatory and additional FDNY requirements consistent with the schematic below and submitted sketches on every floor.
- b. Decons shall be hardened to contain fire in a manner approved by the FDNY and NYCDOB.
- c. 1.5-hour fire rated self closing doors on each decon entrance and exit equipped with magnetic holds connected to heat detectors in the decon.
- d. Vestibules shall have a separate, clearly labeled FDNY Emergency bypass that provides direct access to the contained Work Area without going through the decon.

- e. Proposed design of the decons will be reviewed and approved by USEPA, NYSDOL, NYCDEP, OSHA, NYCDOB, and FDNY prior to commencement of abatement work.
- f. Waste and Equipment Decon units shall be constructed on *every* floor, within the established north vestibule areas to provide access for the removal of waste from each floor.
- g. While south vestibules shall be used primarily for Personnel Decons, Waste & Equipment Decons may be constructed within the south vestibules, as dictated by site conditions.



Schematic Drawing for reference only (Not to Scale)

- h. After passing through the Waste & Equipment Decon, sealed waste containers containing asbestos, PCB, hazardous and universal waste shall be transported down the construction hoist to the hoist loading platforms, to be loaded into an approved waste transport vehicle.

E. The gash area on the north side of the Building from the 6th floor to the 19th floor was included within abatement work areas on each of those floors. These areas have been cleaned of remaining materials and contamination, including cleaning or removal of the floor cell systems.

F. The two (2) existing building stairwells, connecting hallways and ground floor access, shall be maintained free of obstructions below the highest abatement activity, except for the vertical polyethylene barrier at the top of the contaminated portion of Stairwell B, as approved by FDNY. One code compliant internal means of access/egress shall be maintained at all times using a combination of Stairwells A and B and transfer corridor(s) to the 20th floor. All interior stairs shall be accessible in the event of an emergency. Stairwells A and B shall be isolated from work areas with two layers of polyethylene sheeting and by sealing the door frames using low-adhesive tape (without any polyethylene covering the door itself) as part of the work area preparatory activities on each floor.

G. Where no building curtain wall exists (North Side gash), or where windows are missing, barriers have been installed to complete the building perimeter. Wall construction conforms to requirements identified in NYSDOL ICR 56, building enclosure requirements of the site specific variance reopening request and proposed plan modification as well as NYCDOB requirements.

H. The non-porous metal ventilation louvers, on the 5th floor machine rooms, were enclosed with a minimum 3/8" fire retardant plywood and sealed, bringing the louvers into the environmental containment work area. Mounting surfaces on the building, where barriers were attached, were precleaned prior to barrier installation.

Within the 5th floor containment, the non-porous metal louvers were removed, by pulling the louvers into the containment, where they were cleaned and disposed of as conventional waste, or wrapped in two (2) layers of polyethylene to be disposed of as asbestos.

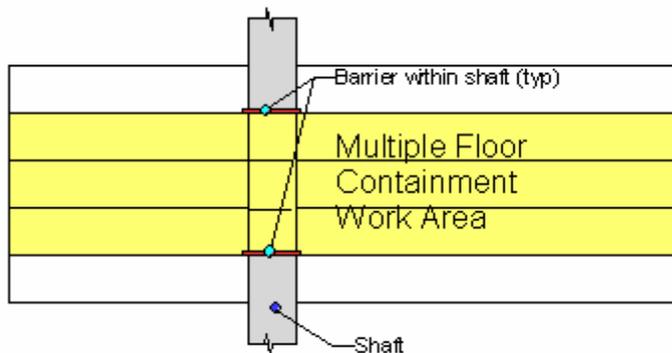
I. To provide effective environmental containment, the top and bottom floors of each contained floor grouping shall be sealed between the curtain wall and the concrete floor slab. To access these areas the perimeter convection enclosures and the perimeter convection units shall be removed to provide access to the space between the curtain wall and the floor slab. On other floors where the removal of the perimeter convection enclosures and the perimeter convection units is not required to install a barrier around the perimeter, the perimeter convection enclosures and the perimeter convection units shall be removed with the remainder of the floor, after the containment is established.

J. Perimeter column enclosures shall be sealed

1. Negative air system must be installed and operational.
2. The lower portions of each of the twenty eight perimeter gypsum wallboard column enclosures, on the interior of the building, shall be removed to provide access to the interiors of those enclosures.
3. Fireproofing shall be removed at the base of the columns to allow barrier installation, proximate to the slab.
4. A barrier, constructed in accordance with ICR56 requirements and relevant regulatory requirements, shall be installed within the enclosures, outboard of the slab, to seal that floor from adjacent, non work area, floors.
5. This procedure shall not be required on each floor, but only the bottom floor of each multiple floor containment.
6. After work is underway, the bottom floor barrier shall become the upper boundary barrier for the next group below.

K. Elevator Shafts

1. The two exterior dual car construction hoists shall be maintained as clean cars and used to provide vertical transportation during the course of the project.
2. Existing interior elevator cars have been taken out of service and decommissioned and designated and marked "OUT OF SERVICE".
3. Interior elevator cars have been secured and weights and cables have been removed and designated and marked "OUT OF SERVICE".
4. Interior elevator doors shall be removed from work area floors. Fall protection barriers shall be placed at door openings, in accordance with OSHA requirements and door openings shall be designated and marked "OUT OF SERVICE".



Shaft Barrier Schematic

5. Elevator shafts shall be isolated at the bottom floor of each containment, and from the previously abated floors above, with a deck constructed of structural beams, planking and fire-retardant plywood and sealed with two (2) layers of 6-mil polyethylene at a minimum on the top side of the barrier. Barriers within shafts shall be constructed and hardened in accordance with NYCDOB and FDNY requirements and approved by a NY State Professional Engineer and NYCDOB.
6. With the aforementioned barriers in place, the shaft is included within the contained work area.
7. Decontaminating the area of these shafts with the floors shall prevent ACM, and other nonporous materials, from being left behind within otherwise inaccessible locations. This procedure shall expedite the schedule by not requiring a separate phase to clean the Building's remaining elevator shafts.

L. Building Core Areas and Mechanical Shafts

1. Negative air system must be installed and operational.
2. Portions of masonry walls shall be removed, as necessary, to provide access for the removal of fireproofing materials. Masonry walls that remain in place shall be cleaned and cleared with the work area.

Note: Selective demolition of some interior masonry walls will be required to gain access to areas to install critical barriers or to allow access for abatement. Otherwise, all interior masonry walls in the building will remain in place to be removed, along with concrete and steel, during structural deconstruction.

3. Selected piping will be removed but only where necessary to permit barrier installation (i.e. piping within shafts shall be removed to below that floor slab) and to achieve visual clearance acceptance prior to clearance air monitoring. Prior to removal of vertical piping, the floor above will be examined to ascertain if the pipe continues. Piping continuing above will be removed or appropriately anchored prior to removal below. In any event, pipes shall be adequately supported vertically and horizontally prior to cutting and the piping that is left in place must be appropriately anchored to ensure safe conditions in accordance with Bovis/LVI pre-task plan and risk assessment. Ductwork shall be cleaned, on the interior and exterior, and removed from the work area, as conventional waste. Where large sections of ductwork can be accessed and cleaned inside and outside, those sections may stay within the work area to be cleaned and cleared with the floor, at the discretion of the onsite supervisor. The dry standpipe system shall not be removed nor shall paint be removed from any system component during abatement operations.
4. The exposed elevator/mechanical shaft openings shall be covered, at the bottom floor of each containment and from the previously abated floors above, with a barrier constructed of structural beams, planking and fire rated plywood using a similar decking method employed within the elevator shafts. The underside of the barriers will be hardened as per FDNY requirements, except on floors 4-6 where the topside of the barriers will be hardened. Barrier construction within shafts shall be constructed in accordance with NYCDOB requirements and approved by a NY State Professional Engineer and NYCDOB.
5. Decks, identified above, constructed within the elevator/mechanical shafts, shall be caulked and sealed with two (2) layers of 6 mil polyethylene, forming a barrier, meeting the requirements of NYS ICR 56 and relevant regulatory requirements.
6. With decks in place, the interior of the mechanical shafts are effectively within the containment work area, sealed at the top and bottom of the shaft.
7. No burning (i.e. torch cutting) operations shall be allowed within containment during abatement. Burning operations outside of containment shall require the approval of FDNY.

- M. Negative air units, required to establish negative pressure and a minimum air exchange of 4 air changes per hour, shall be located, in banks of 5, as identified in the approved variance and powered through master disconnect switches at a single location approved by FDNY at grade outside of the building. These units shall be placed to provide a laminar air flow, across the work area, eliminating dead spots. The number of negative air units, assuming the exclusive use of 2,000 cfm units, rated at a more conservative flow rate of 1,500 cfm per unit, shall be as shown in the following example, for a typical floor.

$$[182' \times 182' \times 13' \text{ (average deck ht)}] \times [1/1,500\text{cfm}] \times [60 \text{ min/hr}] \times [4 \text{ air changes}] = 19.14 \text{ units} = 20 \text{ units}$$

An additional five negative air units shall be installed as "back up".

While we do not intend to proceed with work requiring air exchanges greater than four/hour, we shall follow variance requirements, if methods and procedures are used that dictate a higher rate of air exchange.

- N. After all engineering controls are in place and negative pressure is established removal activities shall commence. In general, work shall proceed from the top down.

O. All ACM, friable and non friable, and porous materials shall be handled as asbestos *at a minimum unless alternate approach is approved by regulators*. No attempt shall be made to clean porous materials. All ACM, friable and non friable, and porous materials shall be properly packaged and disposed of as asbestos waste. Where PCB, hazardous and universal wastes are encountered, more stringent handling, disposal, etc. requirements shall apply.

Typical porous materials identified on this project shall include but not be limited to:

1. Fireproofing (except as described in Paragraph T below).
2. Carpets.
3. Ceiling tiles.
4. Insulation materials (e.g., fiberglass and paper jacket covering).
5. Gypsum wallboard.
6. Paper, etc.

P. Non-porous items within the prescribed work areas shall be:

1. cleaned of all surface contaminants, to a visual cleanliness standard, as mandated by ICR 56, and relevant regulatory requirements and disposed of as conventional construction waste, recycled, salvaged, or
2. not cleaned, double bagged, boxed or wrapped for disposal as asbestos waste, or
3. cleaned, with the work area, and left in place to be cleared with the floor.

The option of cleaning nonporous materials or disposing of them as asbestos shall be at the discretion of the on-site abatement supervisor.

Determining factors for material disposal as asbestos or C&D shall be:

1. Ease of cleaning.
2. Required time to clean.
3. Ability to completely clean.

In accordance with regulations and site specific issues, cleaning of non-porous materials shall require that visible contamination be removed from all surfaces prior to the removal of that material from the containment work area. These non-porous materials shall be disposed of as conventional construction waste or recycled. The non-porous materials identified at this site include, but are not limited to:

1. Raised flooring components.
2. Metal ceiling suspension systems, including black-iron, "T"-Grid, hangers.
3. Conduit.
4. Metal studs.
5. Ductwork.
6. Piping, excluding dry standpipe system.
7. Light units.
8. Perimeter convactor units, including metal convactor enclosures and covers.

9. MEP equipment from mechanical rooms, including pumps, motors and fan units.

10. Formica desks and cabinets

Q. Pipes, conduits, hangers and other non-porous 'immovable objects' may be left in place to be cleaned and cleared with the work area.

R. In Mechanical Equipment Rooms

1. Motors and other immovable equipment shall be power washed, after an effective water collection system is in place, vacuumed and/or wet wiped to remove surface contamination. Motor interiors shall be cleaned by accessing all areas to ensure that equipment is clean.
2. Hand tools, e.g., wrenches, screwdrivers, etc., shall be used to mechanically disassemble equipment. Where required, this work shall be supplemented with the use of reciprocating saws and other cutting tools, which shall be used to cut only non-asbestos metal equipment components where other hand tools are not effective. As identified in the NYSDOL Variance 05-0427, open flame cutting shall not be permitted. All power tools used to drill, cut, or otherwise potentially disturb WTC dust/debris/residue during equipment dismantlement in regulated abatement work areas shall be manufacturer equipped with HEPA-filtered local exhaust ventilation.
3. Where interior cleaning cannot be guaranteed for items such as small motors, those objects shall be double wrapped in 6 mil polyethylene for disposal, as Asbestos containing material.
4. Large sealed equipment with no open exposure to the atmosphere, i.e., chillers, heat exchangers, etc. shall be cleaned of all exterior surface contamination and left in place.
5. The area shall be cleared with large immovable equipment left in place. After the floor slab above is removed during the deconstruction phase, the cleaned equipment shall be removed. That equipment shall be rendered inoperable and recycled.

S. Abatement work, including demolition and handling of materials within the containment areas, shall be performed manually. Waste materials shall be packaged on the floor of origin and "double bagged" at the waste decon in accordance with regulatory requirements. The majority of waste shall be removed from the Building using the exterior construction hoist on the north side of the building, supplemented with removal of material using the south hoist.

T. Fireproofing shall be removed in accordance with an approved variance.

U. Removal of multiple types of materials within a single containment shall follow the sequential order from the ceiling down and/or from the most friable to the least friable in each active abatement area, as identified in the project variances. All ACM, friable and non friable, and porous materials shall be handled, and disposed of as an asbestos containing material.

V. Floor Cell Systems

Specified floor slabs within the building contain an electric floor cell network, comprised of an upper system, within the concrete slab (Walker Ducts) and a lower system, as an extension of the corrugated metal deck (raceways). These systems, existing between the 6th and 17th floor slabs, run perpendicular to one another. The work of this section shall conform to requirements addressed in the Site Specific Variances 05-0427, as applicable, or in accordance with ICR 56. All floor cell work shall be performed, within a negative pressure containment, per the approved variance.

1. HEPA vacuums shall be used to remove accessible gross contaminants from openings into floor cell systems.
2. Wire will be pulled from the raceways and Walker ducts and disposed of as ACM, or cleaned and disposed of / recycled as conventional waste.
3. Where the electric floor cell system is a boundary floor between containments, the existing access holes, *between* the Walker Duct system on top and the raceway system on the bottom, shall be sealed as they become exposed. This isolation barrier shall be sealed using caulk, expandable foam or duct tape to form an airtight seal. Where the floor slab is not a part of a containment boundary, e.g. the 19th floor slab within the 18/19 containment area, barriers shall not be required.

4. Work on floor cells shall be performed when all areas being accessed are under negative pressure containment, in accordance with approved variances. Work shall be performed by workers possessing NY State and NYC Asbestos Handler Certificates.
5. Floor cell systems will be cut open and cleaned of visual contaminants in accordance with requirements identified in ICR56, as follows:
 - a. Access to the system of raceways, beneath the structural Q-deck, shall be achieved by saw cutting and removing the metal plates, using electric shears, nibblers, or other similar means. These metal plates shall be cleaned for disposal / recycling as conventional waste, or packaged and disposed of as Asbestos waste.
 - b. Walker ducts, present within the slab, shall be exposed using wet methods by removing the concrete topping above the duct using HEPA filtered saws, chipping hammers, other similar tools or any combination thereof, to expose the metal duct. Concrete debris, generated during this activity, shall be disposed of as Asbestos waste. With the metal duct exposed, the duct shall be cut open with a HEPA filtered electric saw, nibbler, shear, or similar means to expose the *interior* of the duct, for cleaning and visual inspection.
6. Visual inspections shall be performed to insure that cell systems are free of visual contaminants by a NYS/NYC Certified Asbestos Supervisor, followed by satisfactory Project Monitor (TRC) visual inspection.
7. If the area is determined to be adequately clean by TRC, no further work is necessary. If visible debris is identified, additional cleaning will be performed.
8. Cell system under decontamination chambers shall be removed via full containment with an attached decontamination chamber per variance 05-0427 following clearance of floor.

W. Work shall proceed, within each negative pressure enclosure area, until all ACM, WTC Dust and porous materials have been removed unless alternate approach is approved by regulators and the area is visually clean. Items remaining shall include, but not be limited to, dry standpipe system, stairwell enclosures, the cleaned concrete floor slab, interior masonry walls, metal door bucks, corrugated steel deck, structural steel columns beams, curtain wall components and large, cleaned equipment to be recycled.

All interior masonry walls in the building will remain in place and shall be removed along with the concrete and steel during structural deconstruction activities, though selective demolition of some interior masonry walls shall be required to gain access to areas to install critical barriers, or to allow access for abatement.

X. In accordance with ICR 56, the Contractor will notify TRC, the Project Monitor, when the area is ready for visual inspection. Following this notification, Bovis, LVI, ATC and TRC will perform a joint visual inspection of the work area. Upon successful completion of the joint inspection TRC will request a final visual inspection by the appropriate regulatory agencies.

Y. After successful completion of the visual inspection by the regulatory agencies, final clearance air tests shall be performed by the owner's third party air monitoring consultant (TRC).

Z. After confirmation of satisfactory visual inspection and clearance air sample results the work area shall be stripped of abatement protection, decons and all equipment used during abatement. Barriers within the shafts and between slab and spandrel around the floor in place on the lowest floor within multiple floor groups shall be maintained to serve as the upper barrier of the containment immediately below it. Perimeter enclosure barriers shall remain in place to protect work areas below from water intrusion. Except for the vertical polyethylene barrier at the top of the contaminated portion of Stairwell B, no structural barriers shall be constructed within Stairwells A and B and the enclosures around the stairwells shall remain in place on all floors.

AA. All combustible material with the exception of the perimeter enclosure shall be removed in their entirety after a work area grouping is cleared except for materials related to the stairwell enclosures.

AB. Based on the TRC Porous Materials Sampling Summary Results – Stairwell A & B Enclosures – Floor 19-8 including Joint Compound Evaluation, dated January 30, 2009, and the TRC Porous Materials Sampling Summary Results – Stairwell A & B Enclosures – Floor 7-2, dated February 2, 2009, Stairwell A and B enclosures have been deemed non-contaminated and will be handled and disposed of as C&D waste. Based on the TRC Interstitial Space Fireproofing Sampling Summary Results – Stairwell A & B Enclosures – Floors 15-6, dated March 4, 2009, and the TRC Interstitial Space Fireproofing Sampling Summary Results – Stairwell A & B Enclosures – Floors 3-1, the Mezzanine and Basement A, dated March 25, 2009, the fireproofing inside the Stairwell A and B enclosures has been deemed non-contaminated for asbestos and will be handled and disposed of as C&D waste, provided certain alternate deconstruction methods, as described in Section V.D.5 below, and ambient air monitoring, as described below, are implemented during removal to address other USEPA contaminants of potential concern specific to the fireproofing removal.

The September 7, 2005 Ambient Air Monitoring Plan (AAMP) currently in place for this project will be amended to revise those portions dealing with deconstruction and other non-abatement work activities. Until such an amendment has been reviewed and accepted by USEPA, NYSDOL and NYCDEP, work activities on or above the 11th floor will not occur unless the scaffold monitors located on the 15th floor are active and fully functional for all target parameters identified in the AAMP before such activities commence. Deconstruction while the 15th floor monitors are fully operational will not proceed below the 18th floor until such an amendment has been reviewed and accepted by USEPA, NYSDOL and NYCDEP. The 15th floor scaffold monitors may be turned off subsequent to the successful regulatory inspection of the completion of facade and column cover removal abatement activities on the 11th floor and the cleaning and clearing of Stairwell B if no work activities are occurring on or above the 11th floor.

AC. Plywood and dimensional lumber comprising either barriers or shaft covers will be handled and disposed of as asbestos unless otherwise determined to be not contaminated in accordance with an approved sampling protocol.

IV. Environmental Abatement – Exterior

The exterior abatement phase of the project includes:

A. Cleaning of exterior surfaces of the curtain wall

1. Building wipe-down including any installed hardware cloth shall be performed from the existing scaffold system, within the protected area of the scaffold enclosure.
2. Cleaning protocol shall be in accordance with the NYC DEP's WTC Dust/Residue Roof & Façade Cleaning Procedures.
3. Any foreign materials found on façade ledges shall be bagged and turned over to the Office of Chief Medical Examiner (OCME).
4. Broken glass, found in remaining sections of the curtain wall, shall be double bagged for disposal as asbestos, at a minimum.
5. Hardware cloth (1/4" hardware cloth (1/4" spacing), wire nonporous metal mesh/screen) has been installed on the exterior side of existing glass windows. This material will be cleaned, properly packaged and disposed of as asbestos waste.

B. Removal of non-friable asbestos caulking materials

1. Non-friable asbestos caulking mastic materials were used in the assembly of the building's exterior aluminum column enclosures and associated façade curtain-wall panels. These seams run vertically and are located approximately every 8" across the three (3) faces of each aluminum column enclosure and on the connection seams of the aluminum fascia.
2. After environmental cleanup of the curtain wall, including cleaning of exterior surfaces, and abatement of interior containment areas within a multiple floor grouping has been completed, the removal of column enclosures, with asbestos containing caulking material, shall be able to commence. To ensure complete removal of the asbestos caulk, the entire aluminum column enclosure shall be removed and handled as asbestos waste. Although it is not our intent, in the unlikely event that the interior, or exterior, surface of a column enclosure is unable to be cleaned, the abatement of that column enclosure shall be performed within a tent enclosure in accordance with variance 05-0427, variance amendment #3 and cleaned prior to disposal, as asbestos waste.
3. As a result of the successful implementation of a pilot program to monitor fiber release during the removal of the aluminum column enclosures, work with approved equipment and without tents or other negative pressure enclosures has been approved by the NYSDOL for work under the approved variance.
4. Removal of column enclosures and fascia shall be performed by shearing the aluminum into manageable sections, using methods and equipment approved for use by the NYSDOL.
5. Column sections shall be pulled into the floor of the building and wrapped, individually or in groups of multiple sections, in two (2) layers of 6-mil polyethylene, in preparation for transport and disposal, as asbestos waste.

C. Removal of cleaned glass from the curtain wall

1. Removal of cleaned glass from the curtain wall shall be performed while planking and protection are in place on the exterior scaffold for façade wipe down and column enclosure removal at each floor elevation and flagpersons are in position on street level below (should no sidewalk shed exist).

2. Glass removal shall be kept separate from column enclosure abatement and shall not commence until the façade wipe down is complete at that location. A minimum distance of two column bays, or approximately 50', shall be maintained between column enclosure abatement and glass removal.
3. Glass shall be removed into the Building in large sections and downsized on the floor, in a controlled manner, with hammers, etc. and put in a mini-container. Personnel shall be provided with appropriate protective equipment, e.g., hardhats, safety glasses, Kevlar gloves, etc. during this process.

V. Structural Deconstruction

A. Preamble

1. All operations shall be conducted in a manner which provides utmost consideration for the health & safety of all project personnel, visitors, first responders, other contractors working on the site and the community.
2. Building safety shall be maintained at the highest standard with the project Engineer of Record as the final authority on all matters of structural integrity.
3. The project shall implement Best Practice with regard to fire prevention and protection, to include a strict zero tolerance policy against smoking.
4. All operations will conform or exceed the requirements of the Building Code 2008 or otherwise satisfy the requirements of the NYCDOB.
5. Given the commitment to project safety excellence, project safety requirements may exceed current Federal, State, and local codes & standards. Where conflicts exist, the more stringent requirement shall apply.

B. Safety

1. *This is a no smoking, no drinking project with zero tolerance for violators.*
2. *Decontamination/deconstruction subcontractor will enforce strict standards for worker safety and all work must be conducted in full compliance with the approved Environment, Health & Safety Plan and Emergency Action Plan ("EHSP") for the 130 Liberty Street Building Abatement & Deconstruction Project.*
3. *Non essential personnel and unauthorized individuals will not be authorized access to active work areas.*
4. *All crane operations will comply with Building Code section 28-404 and NYCDOB rule #9. As such, all rigging procedures will be reviewed and approved by a licensed Master Rigger and a foreman designated by the Master Rigger will be present for all picks, except for critical picks, as defined by the Building Code, for which the presence of the licensed Master Rigger will be required.*
5. *Building egress points will be maintained clear at all times, in accordance with DOB and FDNY requirements.*

C. Overview

1. Prior to the commencement of deconstruction activities, all issues associated with the tower crane, scaffolding, permits, submittals, along with other necessary approvals, must be addressed by Bovis Lend Lease and other responsible parties prior to the deconstruction subcontractor commencing with its work. Additionally all outstanding violations on this project that will impact the progress of this work must be satisfied prior to the commencement of deconstruction. Bovis will satisfy all financial and paperwork requirements on them to satisfy all other uncontested violations issued prior to December 1, 2008 prior to the commencement of deconstruction and will expeditiously remedy all other violations issued after December 1, 2008.
2. This plan assumes that prior to initiating Structural Deconstruction activities, including removal of structural steel columns and beams, concrete floor slabs and corrugated decking, all abatement activities will have been completed in their entirety.
3. Prior to deconstruction, all glass will have been removed from the building.
4. One code compliant internal means of access/egress shall be maintained at all times using a combination of Stairwells A and B and transfer corridor(s) to one floor below the lowest deconstruction floor.
5. Exterior scaffold stairs can be used as a means for access to and egress from the building during the deconstruction process.

6. The Engineer of Record, Thornton Tomasetti (TT) retained by Bovis Lend Lease, the General Contractor, shall have a PE on site at the area of structural deconstruction to monitor compliance with the Deconstruction Plan and this Implementation Plan. Additionally the owner's representative (URS) will have a PE on site at the area of structural deconstruction during deconstruction for monitoring purposes. Bovis Lend Lease and URS shall each have a full time safety representative on site at the area of structural deconstruction during deconstruction.
7. Remaining components left for deconstruction include:
 - a. structural steel columns and beams,
 - b. corrugated decking,
 - c. concrete floor slabs,
 - d. non ACM portions of the curtain wall,
 - e. large cleaned equipment, rendered inoperable, to be recycled,
 - f. other nonporous materials which have been left clean and in place, e.g., masonry walls, pipe, conduit, metal doors, etc.
 - g. Wrapped ACM equipment (elevator motors, etc.) will remain and will be removed by the decontamination subcontractor in concert with deconstruction activities. In the event of a rupture, deconstruction activities in the immediate vicinity will cease and the decontamination subcontractor will isolate the area at a distance of twenty-five (25) feet from the outermost limit of the disturbance with barrier tape. TRC and ATC shall be notified and shall inspect the equipment for visible debris. If no visible debris are observed, TRC and ATC shall observe the rewinding of the ACM equipment by the decontamination subcontractor and deconstruction in the area shall resume. If visible debris is observed and the affected area does not exceed 10sf, the decontamination subcontractor shall HEPA-vac and wet-wipe the affected area and rewrap the contaminated item within a negative pressure tent enclosure, as per the requirements of section 56-11.2(f) of the current ICR 56. TRC and ATC will be present to monitor the clean-up activities and collect PCM air samples. Once final cleaning is complete, a visual inspection shall be completed by TRC and ATC to confirm that no visible debris/residue, pools of liquid or condensation remain and that the ruptured item has been adequately rewrapped. If visible debris is observed and the affected area exceeds 10sf, a variance petition will be submitted to address the necessary debris clean-up and the rewinding of the contaminated item. Following the final visual inspection and acceptable clearance air sample results, deconstruction in that area will resume.
 - h. Shaft protection, stairwell enclosures and other remnant porous material deemed non-contaminated by testing will be removed as part of deconstruction. Fireproofing remaining in the stairwells has been deemed non-contaminated for asbestos by testing and will be handled and disposed of as C&D waste as part of deconstruction, as described in Section III.AB above.
 - i. Additional shaft protection necessary for the deconstruction, designed by LVI, approved by the Engineer of Record and ultimately approved by DOB will be installed in appropriate areas prior to start of deconstruction in these areas.
8. The noise mitigation plan currently in place for this project will be updated as needed to address these activities.
9. All temporary structures within the building will be removed by decontamination crews and signed off by DOB prior to the commencement of deconstruction activities, except for the interior foundation wall bracing in cellars A and B (DOB #104634120), Stairwell A and B fire rated enclosures (DOB #104905783), perimeter enclosures (DOB #110108945), shaft barriers (DOB #110108945), cellar A temporary offices (DOB #110136825), standpipe alarm (DOB #110100578) and sprinkler removal (DOB #110100587).
10. The temporary roof on the 20th floor will be removed prior to the commencement of structural deconstruction.
11. Deconstruction work shall be performed in accordance with all Federal, State and City regulatory requirements, as well as project-specific requirements dictated by construction documents and permits. Construction documents refer to Thornton Tomasetti drawings T-000, G-101 and A-101 through A-109. In

certain cases due to the nature of the project, regulatory agencies, FDNY, DOB, the Owner, etc. may require certain reasonable safety measures that exceed current codes and regulations.

D. Deconstruction Process

1. This plan and its operation shall be under the oversight of the Engineer of Record for the project to ensure compliance with the NYCDOB approved deconstruction drawings. For the purposes of closing out NYCDOB deconstruction permits, the Engineer of Record will serve as the control inspector.
2. Prior to the commencement of deconstruction, engineered scaffolding and decking will be installed on the south side of the building on floors 15 – 20 at the area of compromised bay removal. This system will serve as a work platform to assist in the deconstruction of these floors.
3. Deconstruction will be occurring on two floors at a time in a stepped sequence and will continue downward during deconstruction of the structure.
4. Deconstruction activities will be coordinated with activities below, including but not limited to: crushing and backfill operations, basement bracing, scaffold removal, installation of and moving of plywood protection enclosures as deconstruction proceeds down the structure, equipment maintenance, storage, administrative operations, worker lay down areas, installation or maintenance of fall protection, and remaining MEP deconstruction. The deconstruction subcontractor will prepare a pre-task safety plan for these activities for review and approval by Bovis and the owner's representative. Approved pre-task plans will be maintained on site. All activities will be performed in accordance with the approved EHSP. Work will be coordinated daily during the morning deconstruction subcontractor safety briefings.
5. Supplemental Removal Precautions: Stairwell A and B Enclosures with Fireproofing (Floors 15-6 & 3-Basement A)
 - a. As described in Section III.AB above, the fireproofing inside the Stairwell A and B enclosures has been deemed non-contaminated for asbestos. During removal, the immediate area of enclosure will be treated as an area of special concern to address other USEPA contaminants of potential concern specific to the fireproofing.
 - b. Only those personnel directly involved in the removal or monitoring of the stairwell enclosure and fireproofing removal will be permitted within the immediate area.
 - c. Removal of the enclosure and underlying fireproofing will be performed by a dedicated stairwell enclosure removal crew trained in the precautions described herein.
 - d. Prior to each removal event, a toolbox safety talk reiterating these precautions will be held for all involved deconstruction and monitoring personnel.
 - e. A charged water hose to be used for the wetting of materials will be maintained in the immediate area throughout the enclosure removal activity. Water will be applied in a judicious manner so as not to damage stairwell enclosure materials below so that the fire-rated stairwell below the enclosure removal is maintained.
 - f. For a given stairwell enclosure with interstitial fireproofing:
 - i. Exposed surfaces of the porous materials comprising the stairwell enclosure will be thoroughly wetted prior to removal.
 - ii. Porous materials comprising the stairwell enclosure and interstitial fireproofing exposed by removal activities will be thoroughly wetted and maintained wet throughout removal.
 - iii. Porous materials comprising the stairwell enclosure and interstitial fireproofing removed will be placed in an appropriate C&D container (e.g. hamper, mini, etc.) for transport to grade.

- iv. Non-porous materials (i.e. metal studs and handrails) will be bundled and/or loaded in/on an appropriate C&D container (e.g. A-frame, hamper, mini, etc.) for transport to grade.
 - v. At grade all porous materials comprising the stairwell enclosure, fireproofing and non-porous materials will be placed in a C&D container or packer truck for disposal as C&D waste.
 - g. In accordance with OSHA regulations, representative exposure air monitoring of personnel performing removal activities will be performed from which an exposure assessment may be generated. Potential contaminants to be monitored for include:
 - i. Crystalline Silica
 - ii. Metals (antimony, barium, beryllium, cadmium, chromium, copper, lead, mercury (particulate bound), manganese, nickel and zinc)
 - h. Ambient air monitoring during the enclosure removal activity will be performed by the Owner's environmental consultant (TRC) as described in Section III.AB above.
6. While corrugated decking and concrete is being removed, structural steel, beams and columns shall be torch cut (all torch cutting operations to comply with references to fire guard during burning operations in compliance with FDNY and NYC DOB requirements set forth in paragraph 12 below) and moved to a load out area on the floor where the steel sections shall be cut into manageable sections. Steel shall be removed from the building with the tower crane, either in bundles, secured with chokers, or in a skip bucket. Downsizing of steel will be done at grade to the extent practical.
7. Calculations, showing allowable equipment floor loading, will be submitted, by the Engineer of Record, to the New York City Department of Buildings in advance of the commencement of deconstruction activities.
8. Vibration monitoring will be performed in the building itself. Should cracking attributable to the deconstruction of 130 Liberty Street be identified in buildings or sites within 90 feet of the project site, monitors will be installed over each crack and monitored weekly until they are deemed to be stable.
9. Remaining pipes, hangers, ducts, etc. shall be removed from the floor by torch cutting and mechanical means. All perimeter piping within one column bay of the exterior of the building (excluding the MER room and the horizontal portions of the 18th floor expansion loop) shall be removed prior to structural deconstruction activities. The Engineer of Record and the deconstruction subcontractor shall inspect the perimeter column bays with the FDNY to ensure that all such piping has been removed prior the restart of deconstruction. Interior piping will be secured at all floor levels and an inspection will be performed prior to removal. All piping must be removed from the top down. Special precautions shall be taken for any existing piping that remains. A pre-task plan shall be prepared for this task and reviewed by DOB and FDNY.
10. The perimeter columns and spandrel beams shall be removed as follows:
 - a. The deconstruction subcontractor will create holes above and below the cut location either by torch cutting or drilling. Shackles will be inserted in the holes and cabled together to prevent columns from falling outboard of the building during cutting (see Figure 1).
 - b. Points of attachment shall be made with steel cable chokers around the columns at one end and a CAT 226 loader (or equivalent) at the other end of the cabling chokers. Alternatively, the deconstruction subcontractor may opt to use the crane to rig in place sections of assembled steel (joined vertical and horizontal members) prior to cutting them free from the remaining structure. If lifts of sections rigged in place are determined to be critical lifts, as defined by the Building Code, they will be performed under the supervision of the Master Rigger.
 - c. The CAT 226 loaders (or similar equipment) shall assist in the removal of perimeter columns. These machines shall be used to pull the columns and spandrel beams inward onto the floor during this process.

- d. After the CAT 226 is in place and secured to the perimeter column, the remaining procedures for this work shall be permitted to proceed.
 - e. Structural steel perimeter columns shall be removed by pre-cutting the steel columns above the concrete floor slab. OSHA compliant fall protection, per 29CFR1926 – Subpart M – Fall Protection, shall be maintained during this and other deconstruction activities with the scaffolding enclosure system surrounding the building to manage fall exposures. Scaffold deconstruction levels shall be planked and protected with plywood, as required, during the course of that work.
 - f. Prior to cutting operations, an exclusion zone shall be established to delineate the drop area of column sections. No personnel shall be allowed to enter the area except designated pre-burn workers.
 - g. Prior to cutting operations, a spark shield made of non-combustible materials such as metal shall be inserted between the cut and the perimeter plywood protection to divert sparks and slag away from the plywood.
 - h. During cutting operations, the operator of the CAT 226, with the assistance of a laborer, shall monitor cable tension and remove slack in cables, maintaining a constant pull on the section being brought inward. All cables will be inspected daily by a competent person to confirm compliance with design tag and to ensure that wire ropes are not placed directly against edges.
 - i. Plywood protection will be thoroughly and continually wetted in the immediate vicinity of each cutting operation immediately prior to and during that operation.
 - j. Columns shall be cut, leaving 'tabs' that will ensure that the columns remain vertical until they are pulled inward with positive control (see Figure 2). All cuts will be continued to completion once they have started prior to the conclusion of the shift.
 - k. Operators shall remain in the cab of the CAT 226 at all times during the operation.
 - l. After columns have been prepared, the CAT 226 shall move away from the curtain wall, pulling the columns inward on to the floor slab (see Figure 2). After the columns have been pulled inward and onto the floor slab, the bent over 'tabs' shall be torch cut to sever the columns from the column stub below.
 - m. The steel columns and beams shall be downsized as necessary for handling and lowering to grade; steel braided cables will be utilized to secure steel to the crane. Any further downsizing of steel will be done at grade to the extent practical.
11. Structural steel shall be individually picked, collected into bundles, or placed in metal containers or 'skip buckets' to be lifted and placed in the North Plaza lay down area (see Figure 3). The Deconstruction subcontractor may opt to rig sections of assembled steel (joined vertical and horizontal members) off the building to be placed in the North Plaza lay down area for sizing and processing prior to removal from the site. Deconstruction subcontractor will utilize softeners constructed of fire hoses and rubber to keep the load from slipping during rigging operations.
 12. All burning operations will comply with the Fire Prevention Code and Building Code. During burning operations and in accordance with Section F. Fire Protection below, a fire watch (one per torch operator on the deconstruction floor, one per torch operator on the floor below and one on each of the four floors below that) and burner (with FDNY certificates of fitness) shall be present. After burning operations are completed, a fire guard will be stationed at the point of burning operations and conduct a first inspection for at least 30 minutes and a fireguard will remain on the floors below for an additional 30 minutes after the completion of the first inspection. Oxygen and acetylene bottles will be removed from the building at the end of the shift. Prominently located fire extinguishers will be placed on every floor in the building during deconstruction activities. All fire watch personnel shall wear hi-visibility vests labeled "FIRE WATCH" while performing fire watch duties.
 13. Any fire that ignites material irrespective of the cause or size must be immediately called into 911. If the fire can be extinguished locally it is acceptable to do so by appropriately trained individuals. A designated Bovis

representative will meet first responders at the Albany Street entrance and escort them to the location of the fire.

14. The tower crane, constructed in the north plaza area, shall be used to hoist structural steel and/or containerized debris off of the building, as well as to place equipment within the building (see Figure 3).
15. Structural steel, light iron and other materials shall be rigged or downsized as required and lowered to the ground level using the tower crane. Downsizing of steel will be done at grade to the extent practical. Below the 10th floor, the deconstruction subcontractor may opt to use alternate hoisting methods, such as a mobile crane or other equipment approved on the DOB Mechanical Means Permit. Any packaged ACM (elevator motors, MEP equipment) remaining after abatement will be placed, at the deconstruction subcontractor's option, in steel containers and hoisted off of the building using the tower crane or loaded into appropriately labeled, lined and covered carts and lowered via the exterior hoist, where practical.
16. Floor slabs shall be deconstructed using manual methods, small excavators and rubber tire loaders equipped with hydraulic breakers and sent to the floor slab below as follows:
 - a. A chase of suitable width shall be chopped through the slab and metal decking around the perimeter of each bay. Spotters and supplemental protection in the form of barricades, shaft covers, railing, caution tape, spray paint demarcation, and curbing will be utilized to keep personnel and equipment away from working edge. At a minimum, floor openings shall have curbs or stop-logs to prevent equipment from running over the edge. Likewise, no personnel shall be allowed within 6 feet of an unprotected edge unless fall protection is utilized. In all instances, the hierarchy of fall protection shall be employed (i.e., prior to the use of personal fall arrest systems, fall hazards shall be controlled through engineering controls such as covers, guards, and full protected work platforms).
 - b. The structural steel supporting the metal decking and slab, or each bay, shall be cut with oxygen/acetylene torches, and shall be lowered to the deck in accordance with the approved NYCDOB deconstruction drawings.
 - c. The metal decking shall be separated from the concrete through the means of a hammer attachment or manual means. Nevertheless, some concrete will remain attached to the metal decking and this combination of metal deck and concrete shall be disposed of as typical construction debris.
 - d. Decking material shall be placed in containers, to be lifted from the building and placed in the North Plaza lay down area (see Figure 3).
17. Cleaned and cleared concrete and masonry debris shall be downsized on the floors and loaded, for transport to the basement or loaded into "skip boxes" to be lowered to grade elevation with the tower crane and placed in the North Plaza lay down area (see Figure 3). The downsized materials shall then be placed as backfill in basement areas, in accordance with Section H below.
18. Steel debris chutes, designed by LVI, approved by the Engineer of Record and ultimately approved by DOB, may be constructed inside the building, in locations which will allow for unimpeded vertical transportation.
 - a. Only downsized clean concrete from floor slabs and masonry walls (maximum allowable material not to exceed 6" cube, or 25 lbs. in weight), cleaned during the environmental abatement, shall be deposited within these chutes.
 - b. If utilized, the top of the chutes shall be screened, reduced or similarly restricted to eliminate the potential of the chute clogging with concrete masonry material.
 - c. If utilized, debris chutes shall be 30" diameter and constructed out of minimum ¼" steel.
 - d. If utilized, the debris chutes shall be supported, on each floor slab elevation, with pre-engineered attachments, connected to the cylindrical debris chute and resting on each floor slab, as approved by the Engineer of Record and the DOB.

- e. If utilized, chutes sections shall be welded and sealed in a manner approved by the Engineer of Record and DOB.
 - f. If utilized, debris chutes shall open into the cellar "B" within an area protected with minimum ½" thick steel street plates, where downsized concrete slabs and masonry walls shall be deposited for use as backfill. This area shall be off-limits for all personnel except for machine operators and laborers designated specifically for debris clearance and shall be isolated using concrete barriers or equivalent. The chute receiving area and surrounding exclusion zone shall be designed by LVI, approved by the Engineer of Record and ultimately approved by DOB prior to use.
 - g. The entrance to the drop zone area shall be protected with a suitable barrier moved with the help of approved mechanized equipment to provide access into that area. The deconstruction subcontractor shall assign a competent person to control the operation of the barrier and control access to personnel during the operation.
 - h. Further access to clean out receiving areas shall be controlled with workers using two way radios at the top and bottom of the chutes.
 - i. Concrete receiving areas shall be constantly wet down with a water misting system while concrete is deposited within the basements to minimize dust during this operation.
 - j. Due to the small size of the concrete and masonry material being sent into the chutes and its vertical orientation, minimal horizontal loads will be applied to chute systems during the work.
 - k. In the event that an obstruction becomes lodged within a chute, causing the chute to jam, the chute shall be repaired with a welded steel patch. Note: Protective barriers, e.g., fire blanket, fire watch (with appropriate certificates of fitness) will be in place prior to commencement of repair activities. The repair activities will be conducted in accordance with the requirements in Section V.D.12 herein.
 - l. Material requiring downsizing using the concrete crushing machine shall be transported from the basement receiving area beneath the chutes to the concrete crushing machine using a front end loader.
 - m. Adequate dust suppression and water misting systems shall be employed in order to keep fugitive dust to a minimum.
 - n. Chute openings, into which workers dump debris, shall be protected by a substantial guardrail approximately 42 inches above the floor or other surface on which the personnel stand to dump the material. Any space between the chute and the edge of openings in the floors through which it passes shall be solidly covered over.
19. Throughout the work day, the work area shall be inspected and maintained to ensure that no light or loose materials are left out in the open. All material and equipment that could potentially become airborne due to high winds (plywood, scaffolding, and metal decking) will be strapped and screwed down at the end of each shift. No material or equipment will be stored within one column bay from the perimeter of the building.
20. Deconstruction subcontractor will reuse existing perimeter plywood protection on floors 23-26 for deconstruction activities on those floors. Prior to deconstruction, the deconstruction subcontractor will repair the plywood, as required, and apply a pyrolitic fire-retardant penetrant to all existing plywood on floors 23-26. Deconstruction subcontractor will install new perimeter protection constructed of fire-retardant plywood as deconstruction proceeds down the building.
21. A flagperson will be positioned at the intersection of Greenwich and Albany Streets where there is no sidewalk protection at the southeast corner of the intersection to manage pedestrian flow when scaffolding or plywood is being removed or deconstruction is underway on the southeast corner of the building.
22. A fire-retardant plywood perimeter to protect the site and surrounding streets will be maintained around the deconstruction decks and four floors below the lowest deconstruction deck. Perimeter scaffolding and plywood will remain one scaffold frame above the highest deconstruction point (slab or column) and will be

lowered concurrent with deconstruction activities. All plywood protection will be screwed to the mullions and continually jumped after the slab for the floor above has been deconstructed and before the steel columns on that floor are removed. All tradesmen removing the scaffolding or plywood shall have applicable training and will use appropriate fall protection. 100% fall protection shall be utilized during the disassembly of the perimeter scaffold system.

23. Concrete exhibiting stains shall be segregated and sampled, analyzed and disposed of based upon the characterization results or reused as basement fill in accordance with procedures described in Section V.H.5 below.
24. Materials lowered with the tower crane shall be placed onto trucks or on the ground for removal from the site. Waste shall be taken to the appropriate disposal site, transfer station, or recycling facility, as dictated by that material, pursuant to the approved Waste Storage and Transportation Plan.
25. In the unlikely event that unanticipated contaminated items are discovered, the deconstruction subcontractor's procedures for cleanup shall comply with ICR 56 and NYC DEP requirements as well as any pertinent site-specific variance decision. All necessary cleanups shall be completed by a licensed asbestos abatement subcontractor using appropriately certified asbestos handlers within negative pressure containment enclosure regulated abatement work areas. Deconstruction activities will stop in the immediate area of discovery until the abatement is complete. A site-specific variance reopening request shall be submitted to address appropriate procedures for this potential cleanup scenario, including the scope and extent of any necessary work stoppage. Any such contamination shall be tested and disposed of pursuant to the approved Deconstruction Plan.

E. Major Equipment

1. The major equipment more fully described in this Section E is contemplated for use at various stages during the deconstruction process.
2. All equipment requiring permitting shall be approved by the Engineer of Record and DOB prior to mobilizing the equipment for work on any floor within the building. Accordingly, all equipment must be inspected and deemed safe for use on site by the deconstruction subcontractor's competent person and equipment operator prior to mobilizing the equipment.
3. Appropriate physical barriers and/or flagpersons shall be used to form pedestrian routes around the site as a means to separate where vehicles operate in close proximity. Pedestrian crossing points shall be provided across vehicle routes to access main entry ways to the building.
4. All operators must be competent to operate equipment (e.g., aerial lifts, scissor lifts, etc.). The deconstruction subcontractor shall provide Bovis proof of training prior to authorizing employees to operate said equipment.
5. Tower Crane
 - a. The Tower Crane, currently installed on the north face of the Building shall be used to:
 - i. Move machinery, equipment and supplies to various working levels in the building.
 - ii. Lower structural steel (individual, bundled or assembled) elements, containers and equipment to be recycled to ground level for transport off site.
 - b. Peter Stroh, PE is the Engineer of Record for the Tower Crane and will continue to perform all Engineer of Record duties under direction of LVI. Crane maintenance and other professional duties related to the crane are the responsibility of LVI for deconstruction activities.
 - c. Refer to the Site Logistics Plan (attached hereto as Exhibit 1) including defined exclusion zone, the use of radios, and Sidewalk Bridge and pedestrian traffic on the north side of the site.

- d. All tower crane jumps shall be performed in accordance with the Bovis Lend Lease Global Alert on Crane Erection, Climbing and Dismantling (attached as Exhibit 2) and the most recent NYC DOB requirements for the same.
- e. Bovis will submit a plan to NYCDOB identifying measures to ensure that sufficient spotters are in place to watch hoisting operations and communicate with hoisting crew and flag persons.
- f. Deconstruction subcontractor may opt to eliminate the use of the tower crane below the 10th floor, and replace the tower crane with a mobile crane to be used on an as needed basis for movement of material and equipment. If the tower crane is eliminated below the 10th floor, deconstruction subcontractor intends to expand the use, size, and location of interior chutes, if used, for debris load out.
- g. LVI is responsible for scaffold jumps and dismantling and loading onto Regional scaffolding trucks.
- h. All cranes shall be shown on the NYCDOB Site Safety Plan.

6. Man and Material Hoists

- a. The existing construction hoist on the north side of the building shall be used for the vertical transportation of workers, materials, waste and equipment to all levels of the building during the deconstruction process.
- b. Bovis Lend Lease will maintain the hoist during the deconstruction process inclusive of jumps as the building comes down. Greg Blinn PE is the Engineer of Record for the hoist and his maintenance and other professional duties are managed by Bovis Lend Lease and monitored by URS.

7. Deconstruction Equipment

- a. All equipment shall be operated in accordance with applicable NYCDOB Mechanical Means permits.
- b. Mini-excavators and rubber-tired loaders, equipped with hydraulic breakers and grapple buckets, shall be used to complete the interior deconstruction at each floor level.
- c. The following is a summary of the deconstruction equipment to be used for deconstruction.
 - i. Concrete Crushing Machine - To crush concrete and masonry
 - ii. Excavators - For the systematic removal of floors slabs and walls
 - iii. Front End Loaders - To handle material on each elevation
 - iv. Hydraulic Breaker Attachments - To break concrete slabs and walls and downsize and break apart concrete and masonry prior to crushing
 - v. Grapple Bucket Attachments - To move irregularly shaped deconstruction debris
 - vi. Containers, "Skip Buckets" or Steel Cable Chokes – To be used during deconstruction to transport steel, concrete and other material to grade level. Containers and "skip buckets" will not be overloaded and will not be loaded above 1 foot below the top of the container or "skip bucket". Containers and "skip buckets" will not be tarped or netted because the Master Rigger has determined that either could cause wind related hazards. Misting will be used to mitigate dust. The Master Rigger foreman will monitor the loading of each container or "skip bucket" and perform a final inspection before each lift to ensure compliance with the above conditions.
- d. Diesel powered equipment with engine horsepower rating of 50 HP and above used on the project shall use only ultra low sulfur diesel fuel (ULSD). Diesel fuel will be stored in the approved 500 gallon fuel storage vessel currently utilized to fuel the tower crane. The fuel storage vessel will be lifted to the floor, equipment will be fueled, and the fuel storage vessel will be lowered to the ground outside of the building. No overnight storage of the fuel storage vessel will be permitted in the building.

- e. Unless otherwise compliant, the deconstruction subcontractor must use diesel engine retrofit technology in off-road equipment to further reduce emissions. Such technology will include Diesel Particulate Filters, engine upgrades, engine replacements, or combination of these strategies.

F. Fire Protection

1. All work must be in full compliance with the Fire Prevention and Protection measures of the approved EHSP.
2. A dry standpipe system shall be maintained within the building from Siamese connections up to one floor below the lowest deconstruction floor, pressurized with air and alarmed to identify any damage throughout the duration of the deconstruction process. The dry fire standpipe will be monitored daily by a Bovis Lend Lease site safety manager. All work performed on the standpipe will be performed by a licensed plumber/licensed electrician retained by Bovis Lend Lease in accordance with FDNY requirements.
3. A permit for the disassembly of portions of the standpipe in preparation for the commencement of deconstruction on a given floor will be obtained for the entire building. The licensed plumber will not disassemble any components of the existing standpipe without prior written approval from and under the supervision of Bovis. Bovis will notify FDNY, NYCDOB and URS prior to any such disassembly. Upon notice, URS shall monitor such disassembly. Following pipe disassembly on a given floor, the licensed plumber will perform a joint inspection with Bovis, LVI, URS, FDNY and NYCDOB of the entire pipe and of the air pressure system to ensure integrity has been maintained. Following successful completion of the inspection, the licensed plumber shall file with NYCDOB a certification that the work has been completed and that the standpipe is fit for use.
4. Water used by the deconstruction subcontractor (dust suppression and fire watch) will be independent of the dry fire stand pipe.
5. Hoses utilized during fire watch operations will have adequate length to reach the farthest distance on a given floor.
6. An adequate supply of fire extinguishers shall be provided and maintained in fixed locations within the building. Specifically, a fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected floor area. Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet. Fire extinguishers must be maintained in a fully charged and operable condition and be visually inspected each month. The deconstruction subcontractor shall provide inspection documentation to Bovis Lend Lease. Bovis Lend Lease shall ensure that such inspections are done and documentation is maintained.

G. Dust and Noise Control

1. During this phase, as with all phases of the deconstruction process, dust palliation shall be a primary goal. Water shall be used at all potential sources of dust generation, throughout all phases of the project, to ensure low levels of dust during the deconstruction process. Laborers, with water hoses equipped with fogging nozzles, shall be situated at potential sources of dust generation to wet down materials.
2. Water shall be provided from a dedicated 2" (or larger) pipe installed in Stairwell B, through a series of pumps to be distributed throughout the work areas of the building, for dust control during deconstruction. Care shall be taken with water usage throughout the deconstruction process using only amounts of water required to insure effective dust control.
3. Dust control shall be maintained at the site throughout the deconstruction process:
 - a. on each level where the deconstruction of concrete slabs is ongoing,
 - b. proximate to concrete crushing operations
 - c. within basement levels where debris is deposited at the base of concrete debris chutes, if utilized.

4. Water supplied to these areas shall be distributed using water hoses, equipped with fogging nozzles, to ensure that airborne particulates are kept to an absolute minimum during this process.
5. A water misting system will be installed within the concrete receiving areas in the basement and shall consist of rubber hoses with fogging nozzles attached to the building structure, structural steel or underside of metal decking. Several fogging nozzles shall be installed at the base of the chute, as deemed appropriate by dust levels generated during deconstruction operations. Dust control for the movement of the crushed concrete and masonry debris shall be maintained using laborers with water hoses equipped with fogging nozzles to ensure that airborne particles are kept to an absolute minimum during the process.
6. During winter operations, environmentally friendly anti-freezing agents will be utilized to ensure unabated water use.
7. All equipment shall be evaluated for conformance with the site NYCDEP Noise Mitigation Plan. Controls measures shall be incorporated as required.
8. Noise levels (dBA) shall be periodically monitored to assess compliance with OSHA requirements for worker exposure.

H. Basement Backfill

1. The Cellar B slab shall not be removed or damaged during the deconstruction of the building. Only the top portion of the foundation walls, protruding above the elevation of the surrounding streets, shall be removed during the deconstruction of the building. At the end of the deconstruction, the 1st Floor and Cellar A slabs will be systematically removed in their entirety, except for those steel members required to remain in place to provide bracing for the foundation walls, to facilitate backfilling the basement.
2. Sump pumps in the basement will be maintained during the deconstruction process and modified to account for backfill operations.
3. During the deconstruction process, a concrete crushing machine will be used in the basement and at-grade elevation to downsize material for use as backfill within the basement areas. The at-grade concrete crushing machine will be located within the North Plaza area, bounded by Liberty, Greenwich and Washington Streets. Units shall not be located on sidewalks or streets. Hoses with fogging nozzles and other misting apparatus will be utilized to minimize airborne dust particulate resulting from crushing operations. An exposure assessment will be performed for crushing operations.
4. Basement areas shall be systematically backfilled and compacted with uncontaminated and recognizable crushed concrete or masonry generated from the deconstruction operations on the floors above, as allowed by NYSDEC regulations. Concrete and masonry backfill material shall conform to specifications identified in the contract documents (1 ½" minus). If additional material backfill is required, cleaned suitable fill, approved by the Engineer of Record, will be brought to the site by the deconstruction subcontractor. The cleaned suitable fill must be exclusively uncontaminated and recognizable crushed concrete, masonry or rock. Use of any other materials for cleaned suitable fill must be approved by NYSDEC.
5. Should the deconstruction subcontractor opt to use painted or stained concrete from the building as fill, it will submit a testing protocol to NYSDEC for its review and approval, conduct sampling in accordance with the approved protocol and submit sampling results to NYSDEC for approval before any such concrete is used as fill.
6. Concrete, structural steel, welded wire reinforcing steel and corrugated metal decking shall be separated, to the maximum extent practicable, on the floor where it is generated. There is also a magnetic attachment on the concrete crushing machine which will pull out reinforcing steel after the concrete slabs and reinforcing steel have been crushed and segregated. Although there is potential for residual steel to still be commingled with the crushed concrete and masonry after the segregation process, NYSDEC has indicated that the

regulations would not preclude its use as on-site backfill. Reinforcing Steel (Rebar), welded reinforcing mesh and other deleterious materials shall be removed from backfill material, as practical. Material piles shall not exceed OSHA criteria for maximum allowable slope angles.

7. Foundation walls shall be braced in accordance with requirements identified by the Engineer of Record.
8. The deconstruction subcontractor shall notify OCME prior to excavation in the north plaza area. OCME shall monitor such excavation and any material of interest identified by OCME shall be turned over to OCME.
9. At the completion of the deconstruction and backfilling operations, the Engineer of Record will file drawings with NYCDOB to request a waiver for the demolition sign-off, including drawings indicating the foundation elements (piles, concrete footings and pile caps, concrete foundation walls, concrete slab-on-grade, etc) to remain intact until such time as the removal of these foundation elements either no longer impacts the stability of the neighboring structures and sidewalks or are utilized within the design of a yet to be determined new structure on the site of 130 Liberty Street. The drawings will include a plan for the drainage/pumping that will remain intact on the Cellar B Level at the completion of the deconstruction and backfilling operations. Bovis/LVI will implement and maintain the drainage/pumping plan until the completion of all contractual obligations, at which point the owner will arrange for continued operations and maintenance of the drainage/pumping system.

Figure 1

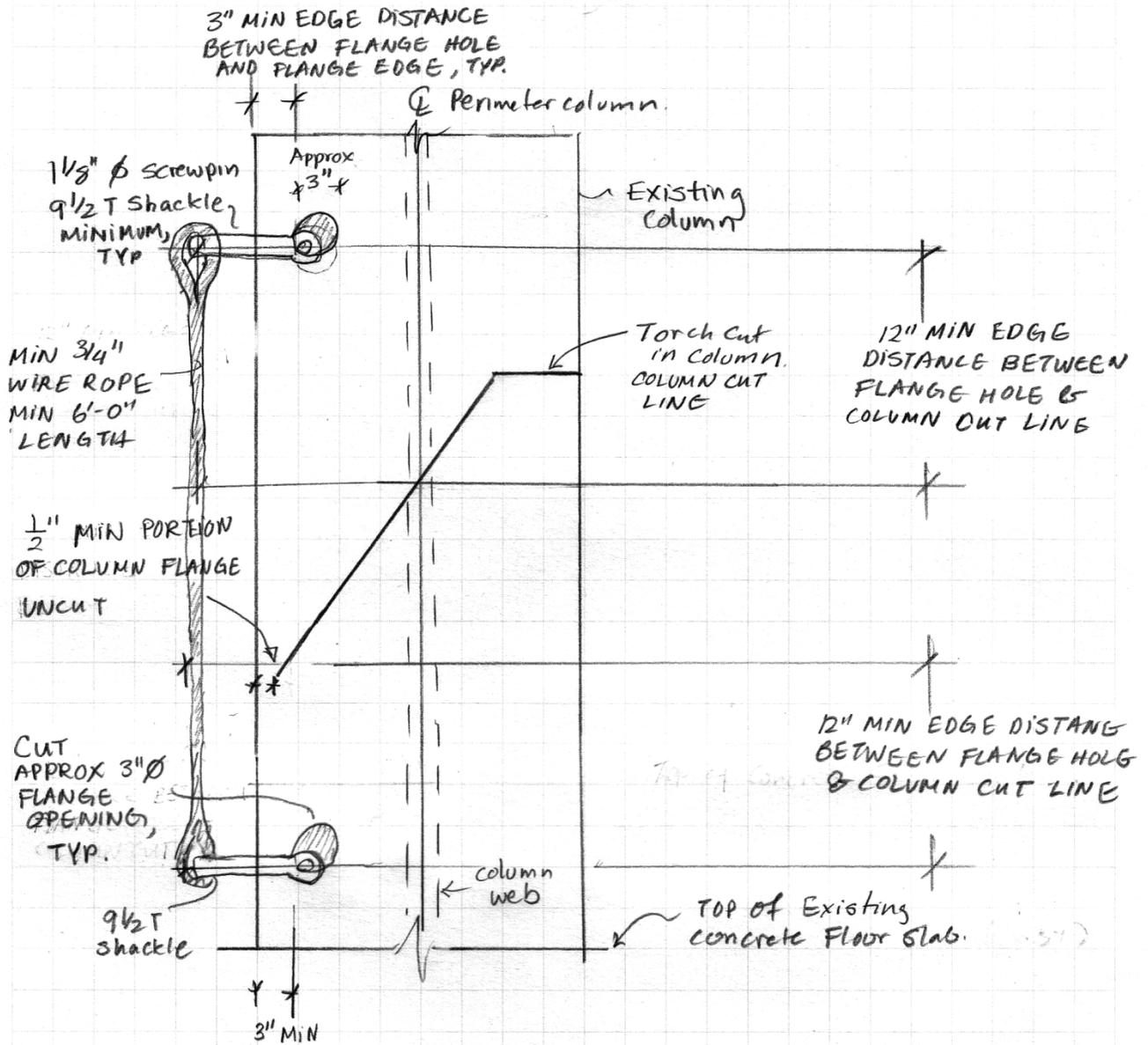
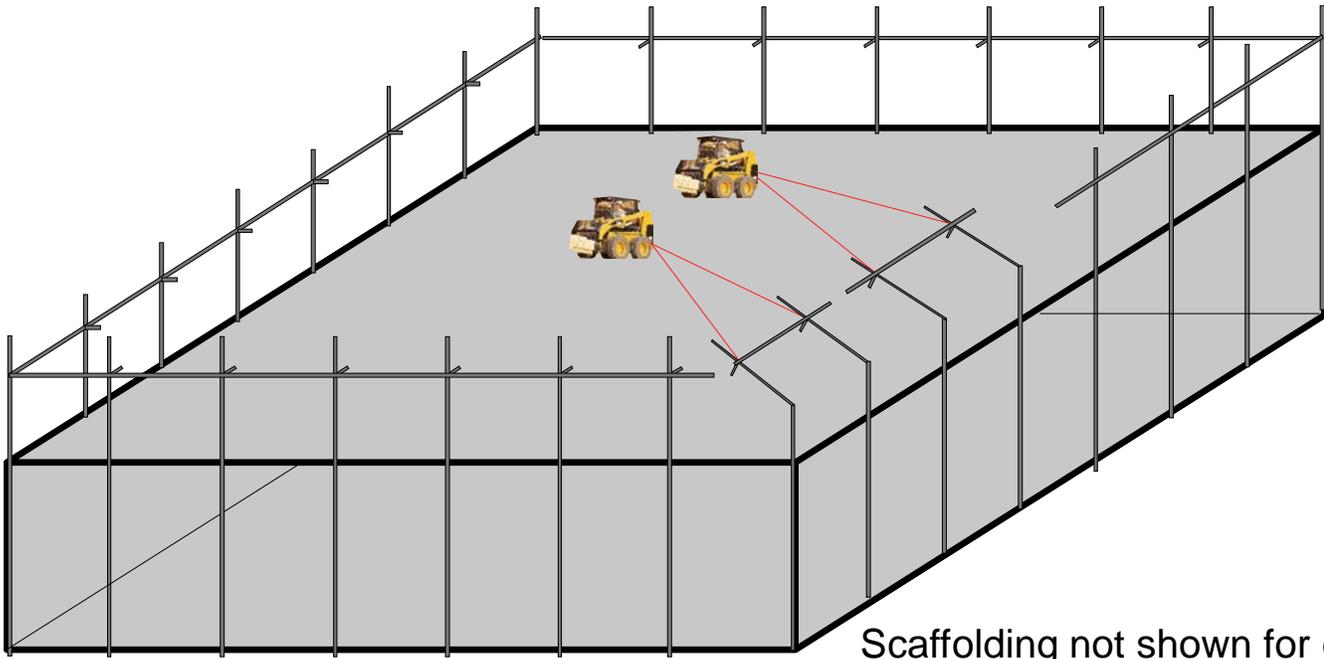
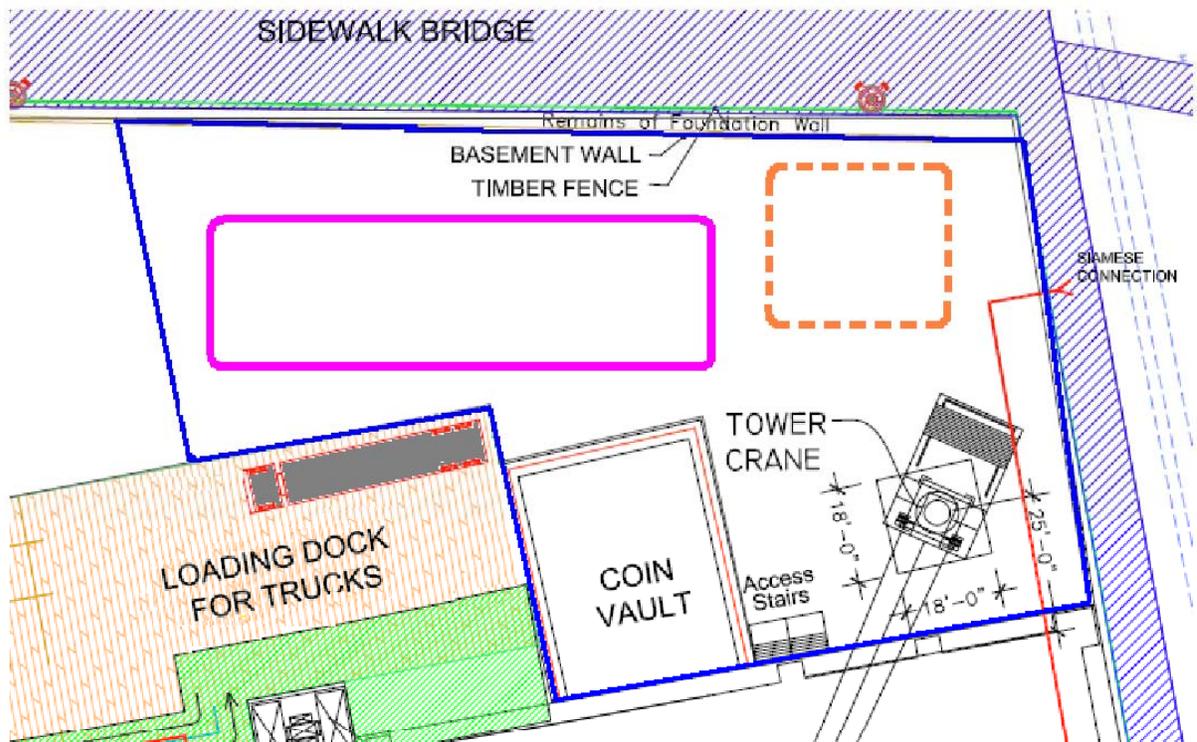


Figure 2



Scaffolding not shown for clarity.

Figure 3



-  EXCLUSION ZONE
-  RECEIVING/SORTING ZONE
-  LOCATION OF EXCAVATOR

Exhibit 2



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Safe Management of Crane Erection, Climbing and Dismantling

From: Bovis Lend Lease Global EHS

Issued by: Stephen Peckitt

Ref. No: GSA 07/02

Issue:

The use of cranes and lifting operations carry significant risks for the business and for those who work on or may be in the vicinity of our construction operations. We, like the general construction industry, have experienced crane collapses, rigging failures and falling loads with frightening regularity and often fatal consequences. This document sets out the Bovis Lend Lease policy for controlling the risks associated with the erection, climbing/jumping and dismantling of cranes. All parts of the Bovis Lend Lease business must ensure that they comply with this policy.

Background:

Crane failures in the construction industry, while relatively rare, are a significant risk and can result in catastrophic results to people and property. Recent crane failures highlight the risks they present:

- Two workers killed when a new tower crane collapsed during crane climbing operation on a Bovis Lend Lease project in Shanghai on 26/12/06.
- Two people killed (the crane driver and a member of the public) and 100 people evacuated from damaged residences when a tower crane collapsed on 26/09/06 in London.
- Five people died in two unrelated fatal crane accidents at bridge sites that occurred within 24 hours of each other in the USA in February 2004.

We have experienced a number of serious crane incidents over recent years, including the tower crane collapses in Shanghai and Washington DC, and the death of a crane driver in New York. The majority of crane failures occur during setup, climbing and dismantling. However, operating outside the crane's safe working limits and metal fatigue in older cranes are also major contributory factors in crane failures.

Bovis Lend Lease Global Policy:

All lifting operations will be managed and conducted in a way that prevents injuries to people and damage to property by ensuring the integrity and stability of all lifting equipment and security of all loads. To achieve this:

1. All lifting machines and equipment procured and used on Bovis Lend Lease jobs will meet the highest appropriate technical standards, comply with all relevant legislation and good practice, and be operated only by certified competent persons.
2. All lifting gear and tackle used to rig/sling loads on Bovis Lend Lease sites will meet the highest appropriate technical standards, comply with all relevant legislation and good practice, and be used only by certified competent persons.
3. All sites with crane operations will appoint a competent Lifting Coordinator to manage crane and lifting operations in accordance with this policy.



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Action Required:

I) Performance Standards

Each business must immediately implement the following performance standards:

1. All cranes procured for use on Bovis Lend Lease projects must be suitable for the tasks they are required to perform, be in sound condition, and thoroughly inspected (with appropriate certificates). Cranes that have key parts (cab, slewing ring, and winch) that are more than 10 years old must be supplied with written confirmation that these parts (and connections) have been thoroughly examined and meet the manufacturer's specifications and all current safety requirements.
2. All cranes must be sourced through reputable suppliers with good track records and rigorous maintenance systems via a formal prequalification process as outlined below in Section II Management Systems, Item #1 Procurement.
3. All crane operations must be carefully planned by competent persons and detailed in project-specific Safe Work Method Statements which address all crane operations per Section II, Item #2 below.
4. All crane erection, climbing and dismantling operations must be controlled using the attached permit system (appendix A) to ensure that competent crews are given sufficient time and resources to complete their tasks safely.
5. Static cranes should only be erected, climbed or dismantled outside of working hours. Effective exclusion zones must be established to prevent danger to construction operatives and members of the public (ie all persons are kept a safe distance away from these operations equivalent to the combined length of the mast and jib).
6. All cranes must be thoroughly inspected by an independent, certified 3rd party before use, after any significant alteration and at regular intervals (at least every 12 months) in compliance with manufacturer's and legal requirements. Cranes with key parts (cab, slewing ring, and winch) that are more than ten years old must be subject to 3rd party inspections every six months (immediate 3rd party inspections are required for such cranes in current use, unless they have had such inspection within the last six months). All 3rd party visual inspections should be inclusive of both the crane as assembled and the integrity of the crane's parts (weld integrity, section and bolt compatibility, cable soundness, pulleys, controls, etc). Where any potential serious defect is noted during visual inspections, the crane must be taken out of service and a full examination of the part(s) must be conducted (eg using Non Destructive Testing).
7. All cranes must be fitted with operational Automatic Safe Load Indicators (ASLIs) and have clear visual indicators of their rated capacity at given radii.
8. All cranes must be operated by competent drivers (certificates must be provided), be used within their safe working limits and conduct daily and weekly safety checks.
9. All cranes must be properly maintained according to the manufacturer's instructions. Maintenance logs must be kept in the cab or on site.
10. Wind speed meters shall be provided and used and weather conditions monitored to ensure the safe working limits of cranes are not exceeded.



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II) Management Systems

Each business must immediately adopt the above performance standards, ensure the following actions are implemented and use the attached permit system to control crane erection, climbing and dismantling operations. These actions should be regarded as the organization's minimum performance measures and businesses are free to expand upon them to improve the control of risks associated with crane operations.

1. **Procurement** – all suppliers of cranes and crane related equipment and services (inc installation and operations) must be pre-qualified to ensure they have a good safety record, sound equipment, formal and effective health and safety management systems and processes and can meet our requirements. Evidence should be provided to demonstrate that all equipment supplied is maintained in good condition and all operatives are competent to safely fulfill their designated roles. The Bovis Lend Lease Prequalification process extends to all (inc. lower tier) crane suppliers.
2. **Pre-start** – all crane operations must be covered by Safe Work Method Statements (SWMS), which should be developed and agreed prior to commencement on site. Each safety critical operation should be covered by a site-specific SWMS that addresses site-specific risks such as the location of electrical services. A competent crane coordinator must be appointed to develop the site specific Lifting Plan, and to coordinate and manage crane operations on site. All certificates of integrity, inspection and competence should be provided before the start of crane operations on site. Proof of competence (training certificates) for crane operators and slingers should be provided and recorded (see appendix B - example of an operator training log). Where there is any doubt that the competence of operators, slingers or supervisors or the validity of certification provided - a Bovis Lend Lease manager should assess or make arrangements for that person's competence to be assessed to validate their competence and understanding of the SWMS and crane manufacturer's safe operating instructions.
3. **Installation, Use and Dismantling** – the crane coordinator should control crane operations on site by ensuring that all permit requirements are satisfied, daily coordination and task hazard briefing meetings are held with subcontractors and operatives, all operators, slingers and signalers are competent, safe slinging practices are followed, and exclusion zones are established. The attached new global permit system for crane installation, climbing and dismantling operations must be adopted and expanded as necessary to cover site-specific risks. Minimize the need for crane climbing operations by erecting cranes to the highest safest point possible during installation. Implement processes (e.g. existing or new permits) to control the use of mobile cranes and lifting operations on site.
4. **Performance review** – the performance of suppliers of crane-related services should be regularly reviewed during their time on site. Any safety violations should be recorded and Just Culture procedures invoked. At the end of their time on site their performance should be summarised and fed back into the prequalification process.

Appendix A: Bovis Lend Lease Permit Approval to Erect, Climb or Dismantle Crane(s)

Appendix B: Lifting Operations Operator Training Log



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A - BOVIS LEND LEASE PERMIT APPROVAL TO ERECT, CLIMB OR DISMANTLE CRANE(S)						
PROJECT DETAILS						
PROJECT			BOVIS LEND LEASE PACKAGE MANAGER			
CONTRACTOR	TEL:		CRANE COORDINATOR			
CONTRACTOR'S MANAGER	TEL:		CRANE LOCATION and ID (number or mark)			
DESCRIPTION OF CRANE OPERATION	Installation <input type="checkbox"/> Climbing <input type="checkbox"/> Dismantling <input type="checkbox"/> Tick box ✓					
STAGE 1 – PRE-START PLANNING						
All elements of the following procedure must be satisfied and signed off before the work is allowed to proceed.						
Safe work method statement for specific crane activity must include:						
1	i. Specific reference made to manufacturer's safety guidelines for activities, including a step by step process description	Yes <input type="checkbox"/>	No <input type="checkbox"/>	ii. Specification of crew roles, responsibilities, competencies and supervisory arrangements	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	iii. Methods of compliance with all relevant legal and contractual requirements	Yes <input type="checkbox"/>	No <input type="checkbox"/>	iv. Limits set on working hours, wind speeds and other weather conditions	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	v. Safety checklists provided for all safety critical operations. (E.g. ensuring check made before any securing bolts or pins are released, bolts are torqued to correct tension, etc.)	Yes <input type="checkbox"/>	No <input type="checkbox"/>	vi. Emergency procedures – including rescue of incapacitated persons from height.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	vii. Safe access to, and fall protection measures for, all work at height.	Yes <input type="checkbox"/>	No <input type="checkbox"/>	viii. Methods of pre-start briefings and tool box talks for the crew.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	ix. Identification of adequate exclusion zones and methods for implementation	Yes <input type="checkbox"/>	No <input type="checkbox"/>	x. Methods and arrangements for crew communications.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	xi. Arrangements for lifting equipment / gear examinations (certificates on site).	Yes <input type="checkbox"/>	No <input type="checkbox"/>	xii. Arrangements for 3 rd party crane examinations (certificates on site).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
	2	Competent engineers have checked the designs and installation of all permanent and temporary works including, crane bases, ties, hard standings and imposed loads on the permanent structure, floor slabs or ground.				Yes <input type="checkbox"/>
3	The impact of the operation on other activities both on the site and adjacent the site have been assessed and adequate controls are in place. I.e. other cranes, other site activities, activities on neighbouring premises, public activities, including transport, electrical (etc) services, and members of the public have been adequately assessed and controlled.				Yes <input type="checkbox"/>	No <input type="checkbox"/>
4	Potential risks from/ to installations and services in the area, have been assessed and precautions put in place (i.e. services overhead and below ground)				Yes <input type="checkbox"/>	No <input type="checkbox"/>
5	Other site-specific items to be completed prior to start on site – (e.g. testing tower crane base unit welds using the magnetic or dye methods before crane erection).				Yes <input type="checkbox"/>	No <input type="checkbox"/>
I confirm that the above requirements planning arrangements have been satisfied and that day-to-day operations may proceed. (This process need only be repeated for operations not included in the SWMS or if circumstances change).						
Package/Safety Manager's name		Signature		Date		
Construction Manager's name		Signature		Date		



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STAGE 2 – CHECKS PRIOR TO PERMIT APPROVAL & COMMENCEMENT OF OPERATIONS

1.	The Safe Work Method Statement from Stage 1 is available on site and the crew has been briefed on it.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2.	The potential risks to other operations on site and activities adjacent the site are understood and precautions in place.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
3.	Weather conditions have been checked and conditions are acceptable to proceed. Water or ice accumulations have been removed from tower crane base.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
4.	Manufacturers' guidance/operation manual and crane log book available with the crane.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
5.	All 3 rd party inspection certificates and other required documents (eg permits or check lists) required to ensure the safety of cranes (including mobile cranes) and lifting equipment to be used during the operation are available and valid (check dates and serial numbers).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
6.	Tower crane driver's training certification has been checked and is in order	Yes <input type="checkbox"/>	No <input type="checkbox"/>
7.	Exclusion zone established by barricades or other effective means to prevent danger to workers and public	Yes <input type="checkbox"/>	No <input type="checkbox"/>
8.	Competent operators, riggers, slingers and signallers assigned to task with good understanding of the safe system of work to follow and methods of communication (inc understanding of fall prevention measures).	Yes <input type="checkbox"/>	No <input type="checkbox"/>
9.	All working platforms on the crane are in good condition and protected with guardrails.	Yes <input type="checkbox"/>	No <input type="checkbox"/>
10	Physical observations – tower crane parts to be erected/climbed appear free from obvious defects, crane hook fitted with safety catch, all chains and slings in good condition etc.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

Competent Persons:	
i. Name of competent person conducting pre-start inspections of crane and lifting gear:	Name:
ii. Name of crane coordinator/person supervising operations	Name:
iii. Name of 3 rd party competent person/organisation conducting thorough examination of the crane after erection or alteration works:	Name:
iv. Name of competent person conducting weekly crane inspections:	Name:
v. Name of competent person conducting weekly lifting gear inspections:	Name:

BOVIS LEND LEASE PERMIT APPROVAL TO ERECT, CLIMB OR DISMANTLE CRANE(S)
 PERMIT IN TRIPLICATE - CRANE CONTRACTOR'S COPY ON GREEN PAPER TO BE DISPLAYED ON CRANE
(Permits are valid for a shift or up to a maximum of 24 hours)

START DATE & TIME:	COMPLETION DATE & TIME:
NOTE: Any violation to the conditions of the permit or other Bovis Lend Lease requirements will lead to the immediate cancellation of the permit and possible penalty.	
Construction/Package/Safety Manager Name	Signature Date
Crane Coordinator Name	Signature Date
Contractors Representative Name	Signature Date

Dr Stephen Peckitt, Global EHS

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