SECTION 02080

HAZARDOUS MATERIALS ABATEMENT REQUIREMENTS SITE SPECIFIC NOTATIONS

PART 1 GENERAL

1.01 INTRODUCTION

The demolition of the facility located at 401 South Tustin Street in Orange will require abatement of certain materials considered to be hazardous (refer to Appendix B). The abatement work will be conducted within the general contract.

A. All removals required by the contract are depicted in the following table.

B. This Site-Specific Specification covers identification of the materials to be removed from the buildings, their general locations, and in some instances estimates of quantities to be removed.

C. Later Sections address abatement procedures for certain of the hazardous materials identified.

D. The recommendations regarding methodology are intended to indicate the Project Environmental Consultant's opinion as to an effective means of ensuring thorough removal of the hazardous materials, compliance with applicable regulations, and protection of the County of Orange from liability for perceived or actual exposure of unprotected personnel to hazardous materials. They are not intended to refute or replace other procedures contained in the General Specification for Asbestos (See Section 02085), or to override applicable laws or regulations. The contractor is responsible for adherence to all applicable laws and regulations, regardless of the Environmental Consultant's recommendations or the Specification's requirements.

E. The contractor is responsible for determining all quantities and for removing all hazardous materials, regardless of the itemization and quantity estimates contained in this document.

F. The demolition firm shall be the same company providing work under Sections 02080, 02085, 02097, 02098, 02099 and 02225.

PART 2 MATERIALS

2.01 MATERIALS TO BE REMOVED

A. An indication of the work to be done is represented in the following table.

Material	Building	Locations	Quantity
Fire Door Insulation (asbestos)	**Main**	**North east-west hall (2) and west north-south hall (1)**	**3 Double Doors**
Insulating Paper on Old Register Boots (asbestos)	**Main**	**North east-west hall and west north-south hall (above ceilings)**	**Approximately 50**
Insulation on Pipe Fittings (asbestos)	**Main**	**Above ceiling in "Conference Room"**	**Approximately 4**
Floor Tile and Mastic (asbestos)	**Central Court Building**	**Under carpet and possibly under new 12x12 floor tile**	**Approximately 1300 square feet.**
HVAC Refrigerant	**All**	**Roofs**	**Approximately 16 units**
Fluorescent Light Ballasts (PCB's)	**All**	**Throughout**	**To be evaluated one at a time**
Fluorescent Light Tubes	**All**	**Throughout**	**n.a.**
Batteries	**Main**	**Storeroom (outside access)**	**2 seen; allow for 5**
Mercury Switches	**Main**	**Where found**	**n.a.**

PART 3 EXECUTION

3.01 CONTAINMENT SETUP

A. The heating register boots can be removed intact after encapsulating the asbestos paper wrapping. The fire doors can be removed intact. The pipe elbow insulation will require the use of glove bags. A containment will be required for the floor tile and mastic. The contractor will be required to maintain the containment until the building is cleared. Critical barriers must be installed on all openings to the area. The negative air machines will be placed in such a way to draw air through the rooms. A three-stage decontamination unit is required. Water must be provided to the shower. Negative pressure must be maintained in the work area until final air clearance has been achieved.

3.02 REMOVAL PROCEDURES

A. The floor tile must be scraped up manually or broken up with a chipper. Mastic must be removed with low-odor solvent. The contractor must provide an airless sprayer to supply the abatement area with the required moisture necessary. Post abatement encapsulation must be accomplished using an airless sprayer. Hand pump "Hudson" sprayers cannot be used as a substitute for the airless sprayer.

B. Disposal Procedures: All floor mastic and miscellaneous waste from the abatement of floor mastic will be hazardous asbestos-containing waste. Friable waste will be double bagged with a generator label prior to "bag-out". All floor tile and window putty will be non-hazardous asbestos-containing waste. Non-hazardous waste will be double bagged

with the OSHA warning label and generator label prior to "bag-out". All asbestos waste will be manifested with the appropriate hazardous or non-hazardous manifest and delivered to a legal landfill. Disposal procedures for PCB Ballasts and Fluorescent Light Tubes are described in Sections 02097 and 02098. Other materials are discussed in Section 02099. A District representative must sign all manifests.

C. Clearance Procedures: Phase Contrast Microscopy will be required for clearance of the floor tile containment. The Project Environmental Consultant will conduct the sampling and analysis. Samples will not be collected until the Project Environmental Consultant judges that the work area is visually clean and any encapsulant used has adequately dried. All other clearances will conducted by the Project Environmental Consultant on a visual basis.

PART 4 OTHER CONSIDERATIONS

4.01 WASTE TRANSPORT ON SITE

A. No waste may be transported between the work areas and the storage containers while other contractor personnel are present.

4.02 WARNING TAPE AND SIGNS

A. Work areas must be clearly identified at all doors with asbestos warning signs in Spanish and English. Areas where equipment and workers are present outside the work areas must be separated from other personnel by warning tape.

4.03 FAILED CLEARANCE

A. The County is paying for the clearance sampling, however if the clearance fails the contractor will be responsible for any subsequent testing. The amount of $300.00 will be deducted from the contract for each set of additional clearance tests conducted.

4.04 PROJECT ENVIRONMENTAL CONSULTANT

A. A certified consultant or site surveillance technician will be engaged by the County through its architect to act as its representative on technical issues relating to abatement, as well as air monitoring. The consultant, who must be present during all on-site abatement activities, must approve all work practices by the abatement contractor. A major responsibility of the consultant will be to minimize the chance of exposure or perceived exposure to asbestos by site occupants.

END OF SECTION

SECTION 02085

GENERAL SPECIFICATION FOR ASBESTOS ABATEMENT

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

This section covers the furnishing of all labor, materials, facilities, equipment, services, employee training and testing, permits and agreements, and waste transport and disposal necessary to perform the work required for asbestos removal in accordance with these specifications, the drawings and notations, EPA, SCAQMD, OSHA, NIOSH, State of California regulations, and any other applicable federal, state, and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.

A. The abatement Contractor shall perform the work and provide the services listed below:
   1. Perform abatement of identified asbestos-containing materials.
   2. Asbestos removal work shall be performed using full and modified containments and protection with HEPA-filtered exhaust ventilation and decontamination facilities.
   3. Perform asbestos decontamination by wet wiping, HEPA vacuuming of all visible debris and dust in affected areas.
   4. Install all necessary scaffolding and planking to keep work areas safe at all times.
   5. Remove, transport, and dispose of as contaminated waste any asbestos-containing building materials as indicated in these specifications and/or as directed by the Certified Asbestos Consultant (CAC).
   6. Thoroughly clean the work areas and obtain a final clearance approval from the Consultant.

B. Section 02080 contains a summary of the materials to be removed in this project. Bidders must confirm and verify all quantities prior to submitting their proposal and start of any work. Quantity information provided in Section 02080 is approximate.

1.02 RELATED WORK

This General Specification does not reference the specific materials present or the unique requirements of a specific project. It is intended as a reference document in the event the Site Specific Notations contain insufficient detail.

1.03 AUTHORITY TO STOP WORK

The Consultant, acting as agent for the Owner, has the authority to stop the abatement work at any time he determines that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of the Consultant. Standby time required to resolve violations shall be at the Contractor's expense. Stop Work Orders may be issued for, but shall not be limited to the following:

A. Excessive airborne fibers inside and outside the work area.

B. Breaks in barriers

C. Loss of negative air (0.02 inches of water is the minimum negative pressure to be maintained.)

D. Any other situation (outside the work area) where the Consultant establishes that the following limits have been exceeded:

Non-Work Area Limits 0.05 f/cc Action level
8-hour TWA PEL 0.1 f/cc

1.04 QUALIFICATIONS

Approval of the experience and qualifications of the contractor by the Owner is required and shall be based on submission by the Contractor of the following:

A. Be a firm specializing in the removal of asbestos, have been successfully engaged in such work for not less than the past three years, and be capable of demonstrating its ability to perform asbestos abatement activities by submitting the following in writing:
   1. Evidence that principals of the firm and all employees involved in asbestos abatement operations are familiar with:
      a. US EPA regulations, 40 CFR Part 61, Subparts A and M
      b. US EPA regulations, 40 CFR 763
      c. SCAQMD Rule 1403
      d. OSHA regulations 29 CFR Part 1926, Subpart C
   2. Evidence of possession of written standard and emergency operating procedures and employee protection plans which include specific reference to OSHA medical monitoring and respirator training programs.
   3. Description of all previous asbestos abatement contracts that have been terminated, including the circumstances surrounding the termination.
   4. Evidence that the firm is licensed by the State of California to perform such work.
   5. Description of violations and citations received by Contractor by any regulatory agency and final determination made by said regulatory agency.

B. Contractor's workers for this project:
   1. Proof that every employee performing the functions of enclosure, removal, or encapsulation of asbestos have:
      a. Had instruction with regard to the hazards of asbestos, safety and health precautions, use and requirements for protective clothing and equipment including respirators, and engineering and other hazard control techniques and procedures, as required by 29 CFR 1926.1101(k)(8).
      b. Had medical examinations as required by 29 CFR 1926.1101(m).
      c. Complete and accurate records of medical examinations as required by 29 CFR 1926.1101(n).
      d. Obtained and hold a current license to work in the state of California.
   2. Competent person(s) conforming to 29 CFR 1926.1101(b) with at least one year of experience on all phases of asbestos abatement projects.
   3. Supervisors/foremen selected for this project must show evidence of supervisory experience on at least five other projects of similar or greater scope. Supervisors/foremen must speak English and be fluent in the languages of their workers.
   4. Environmental laboratory and its employees must conform to the Quality Control Procedures of 29 CFR 1926.1101 Appendix A to analyze personnel air samples.

1.05 DEFINITIONS

Where applicable or stated, terms shall have the following definitions:

A. All terms not defined herein shall have the meaning given in the applicable publications and regulations.

B. Abatement Activities shall mean all activities from the initiation of work area preparation through successful air clearance performed at the conclusion of the project.

C. Air Lock shall mean a confined space designed to control air movement between two areas. It is composed of sealed spaces with curtained doorways at its portals. A Worker Decontamination Facility contains at least three air locks.

D. Ambient Air Monitoring shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the work site.

E. Amended Water or Wetting Agent shall mean water to which an approved surfactant has been added in proportion of at least one ounce of surfactant to five gallons water.

F. Asbestos-Containing Material (ACM) shall mean any insulation, fireproofing, plaster, ceiling, or floor covering, or any other building material containing a detectable amount of asbestos.

G. Asbestos-Contaminated Objects shall mean any objects that may be contaminated by asbestos or ACM as determined by the Consultant.

H. Asbestos Disposal shall mean the removal of containerized asbestos, ACM, asbestos-containing waste material, and asbestos-contaminated objects from the regulated area to the final EPA-approved disposal site.

I. Authorized Visitors are visitors authorized by the Consultant or any representative of any regulatory or other agency having jurisdiction over the project.

J. Barriers or Containment Barriers shall mean walls, tunnels, or enclosures erected to separate any section of an abatement area from adjoining spaces. Where indicated on drawings, barriers shall be constructed of 2x4s, 16" on centers, on plywood walls at least ½" thick, and all seams in plywood and edges shall be sealed with tape and spray glue. The inside (work side) of all such barriers shall be covered with one or more layers of 6-mil polyethylene sheeting, as dictated by the Hygienist. Tunnels to maintain public access through a work area shall also be defined as part of the barriers. Tunnels shall be lined with two layers of polyethylene sheeting.

K. Baseline or Background Air Monitoring shall mean a measurement or determination of airborne asbestos fiber concentrations inside the workplace and outside a building prior to starting abatement activities.

L. Certified Asbestos Consultant is defined as one trained and certified by the State of California to provide consulting services. Certified Asbestos Consultant is synonymous with Consultant and CAC as used throughout this specification.

M. Class I Non-Friable Asbestos-Containing Material is material containing more than one percent asbestos and that, when dry, can be broken, crumbled, pulverized or reduced to powder in the course of demolition or renovation activities. It includes but is not limited to fractured or crushed asbestos cement products, transite materials, mastic, roofing felts, roofing tiles, cement water pipes, and resilient floor covering. (Per South Coast Air Quality Management District Rule 1403)

N. Class II Non-Friable Asbestos-Containing Material is all other material containing more than one percent asbestos that is neither friable nor Class I non-friable. . (Per South Coast Air Quality Management District Rule 1403)

O. Clean Room is the outermost chamber of the decontamination facility. It is used by the workers to change from street clothing into protective clothing and respirators and for the storage of their street clothing.

P. Competent Person is an OSHA-trained Contractor Supervisor, having completed a forty-hour training program at a certified training center and satisfied the experience requirements.

Q. Containment is the enclosed work area. Containments are airtight and normally maintained in a negative pressure status.

R. Contamination means having been in contact with asbestos or other hazardous materials and containing, usually on the surface, visible or microscopic evidence of the materials.

S. Decontamination means removal of contamination to the degree specified in the Contract documents, usually to be determined on-site by the Resident Hygienist.

T. Decontamination Facility is the usually three-stage unit, which is used for ingress and egress from the work area by the workers. It consists of a dirty room, a shower, and a clean room. Flaps separate the rooms.

U. Dirty Room is the innermost segment of a decontamination facility. It is the area where the contaminated tools and personal protective clothing are kept until they can be cleaned or disposed of.

V. Engineering Systems are procedures or physical facilities designed to facilitate the removal of asbestos or asbestos-contaminated items, or to reduce the likelihood of exposure to asbestos.

W. Equipment Room is the Dirty Room.

X. Exhaust Unit is commonly referred to as a negative air machine. It consists of a fan and a series of filters including a HEPA-filter. Its purpose is to pull fresh air through a decontamination facility into the contained work area for mixing with the contaminated interior air and then exhausting the interior air through the filter system to the exterior.

Y. Foreman is the direct line supervisor of the work crew. He is generally directly involved in the interior work activities and is the primary contact with the Project Superintendent.

Z. Friable Asbestos-Containing Material is material containing more than one percent asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

AA. Glove Bag is a polyethylene device designed to be installed around a small area containing asbestos – usually on a pipe. It can be sealed so as to create a containment around a mini-work area. The work is conducted by a worked outside the glove bag using gloves that are an integral part of the bag itself.

BB. HEPA-Filtered Exhaust Units or Fans shall mean a fan equipped with a High Efficiency Particulate Air (HEPA) filter, greater than 99.97 percent efficient by 0.3 micron DOP test, and complying with ANSI z9.2 (1979), Local Exhaust Ventilation. It shall be used to create a negative pressure in a work area (relative to that in surrounding areas) in order to prevent the escape of asbestos fibers. It shall also be used to reduce and control the airborne concentration of asbestos fibers.

CC. HEPA-Filtered Vacuum shall be a vacuum cleaner specifically designed for and equipped with HEPA-filtrations.

DD. Install shall mean to set in place completely ready for normal use or service, including all necessary mounting facilities, connections, and testing.

EE. Isolation Barriers shall mean the construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the workplace from surrounding areas and to contain asbestos fibers in the work area.

FF. Lockout shall mean the safe approved means for shutting down HVAC equipment, electrical panels or breakers, and water, so that they cannot be inadvertently turned back on.

GG. Log shall mean an official record of all activities that occurred during the project and it shall identify the building owner, agent, contractor, workers, floor number, date, work area, and other relevant information to the project.

HH. Major Abatement shall mean the removal of ACM under contained conditions utilizing full isolation and negative pressure systems.

II. Mini-cube Enclosure shall mean a two-chamber (clean room/dirty room) polyethylene enclosure with curtained doorways used exclusively for ingress and egress to the ceiling plenum. The cube shall be constructed of PVC piping or equal and be large enough to accommodate a standard ladder for worker access. The Mini-cube Enclosure shall be equipped with a HEPA-vacuum and Hudson sprayer or other water source for worker decontamination.

JJ. Minor Abatement shall mean the removal of ACM utilizing "glove bag" methods or modified containment.

KK. NIOSH shall mean the National Institute of Occupational Safety and Health.

LL. OSHA shall mean Occupational Safety and Health Administration.

MM. Outside Air shall mean the air outside the buildings and structures.

NN. Outside/Ambient Air Samples shall mean samples collected outside of the containment area in the building and analyzed using the NIOSH 7400 method.

OO. Protect Fixed Items shall mean to cover with solid enclosures and 6-mil polyethylene sheeting and secure by taping or gluing water and airtight.

PP. Provide shall mean to furnish or supply and install.

QQ. Regulated Area shall have the meaning set forth in 29 CFR 1926.1101.

RR. Remove Asbestos shall mean to make a surface free of all visible fibrous materials or microscopically detectable asbestos fibers.

1.06 JOB SUPERVISION

A. The Removal Contractor shall provide on-site an English-speaking Supervisor and at least one Foreman for each work area at times when work is in progress. The Supervisor and Foreman should be competent persons as defined by 29 CFR 1926.1101 and must be experienced in asbestos removal work, knowledgeable of all EPA, OSHA, and local regulations, and capable of skillfully executing all work promptly, efficiently and in compliance with all requirements of this Specification.

B. Before work begins and continuously during the job, a competent person who is capable of identifying asbestos and all other hazards in the workplace and selecting the appropriate control strategy for such hazards, and who has the authority to take prompt

corrective measures to eliminate such hazards, shall always be on site and shall conduct inspections of the worksite.

C. Proof of qualifications and asbestos removal job references will be required, upon request, for both the Supervisor and Foreman.

D. The Owner or Consultant reserves the right to have any supervisory personnel removed if they do not demonstrate the requisite experience or skills to safely direct the work, and adequately protect their own employees or other occupants of the building.

E. The Asbestos Removal Contractor shall instruct, train, and provide with required protective devices, all workers of other trades who must enter any work area before it is certified clean. The instruction shall include at a minimum, proper use and fitting of respiratory protective devices and protective clothing, entry and exit procedures for all work areas, hazards of asbestos exposure, work procedures, and other safety requirements contained in the Specification. Proof of such instructions for all Subcontractor workers, and workers of other trades employed by the Removal Contractor shall be supplied prior to being allowed into the work area.

1.07 PRE-CONSTRUCTION MEETING

After the contract has been executed, the Consultant shall arrange for a Pre-Construction Meeting to be attended by a representative of the Owner, the Consultant (CAC), and the Asbestos Abatement contractor. At this meeting the Asbestos Abatement Contractor shall identify his Supervisor(s) and Foreman, and present two (2) bound copies of the detailed submittal items described in Section 1.25 clearly labeled as described in that section.

A. The parties shall also discuss and reach agreement on the following items:
   1. Contractor listing of existing site conditions (i.e. damage, etc.)
   2. Contractor and supporting vendor access and parking.
   3. Coordinate Contractor access routes to the work area, including approved doors, stairways, corridors, and elevators with the Owner's building management.
   4. Availability of building utility services such as power, water, and drains.
   5. Determination of equipment and other moveable items to be removed from the work area(s) by the Contractor and the location of temporary storage space.
   6. Location, coverage, and use of isolation barriers and Decontamination Facilities.
   7. Emergency response procedures.
   8. Any other technical issues or logistical factors that will minimize interference with the Owner's and the building's tenant operations and facilitate Contractor activities.

1.08 AVAILABILITY OF TRAINED PERSONNEL

There shall be a sufficient number of trained and qualified workers, foremen and supervisors to accomplish the work within the required schedule. Since the Owner's work activities cannot start prior to the successful abatement and demolition of the work area, it is imperative that a sufficient number of trained personnel be engaged throughout the abatement process. No untrained or other personnel not fully qualified and pre-approved shall be employed to speed up completion of the abatement work.

All employees working with or around asbestos-containing materials will need to be trained according to OSHA (CFR 1926.1101 (k) (9). Employees performing Class I and II work shall be required to have a minimum of 32 hours of training, and Class III work shall require a minimum of 16 hours of training as outlined in the OSHA regulations. It is suggested that all workers, including the general contractor and his subcontractors, complete a two-hour Awareness training course. Those projects where trades are working under modified containment conditions and

where the asbestos-containing materials are disturbed shall be considered Class III work and must have 16 hours of training.

1.09 STANDARD OPERATING PROCEDURES

Develop, submit for approval, and implement a standard operating procedure for abatement work to ensure maximum protection and safeguard from asbestos exposure the workers, tenants, and the environment. (See also Section 1.25 - SUBMITTALS.) The standard operating procedure shall ensure:

A. Tight security on a 24-hour basis from unauthorized entry into the workspaces.

B. Proper protective clothing and respiratory protection prior to entering the workspaces from the outside.

C. Safe work practices in the work place, including provisions for inter-room communications, exclusion of eating, drinking, smoking, or use of procedures or equipment that would in any way reduce the effectiveness of respiratory protection or other engineering controls.

D. Proper exit practices from the workspace to the outside through the showering and decontamination facilities.

E. Removing, encapsulating, or enclosing asbestos in ways that minimize release of fibers.

F. Packing, labeling, loading, transporting, and disposing of contaminated material in a way that minimizes or prevents exposure and contamination.

G. Emergency evacuation of personnel for medical or safety (fire and smoke) so that exposure will be minimized.

H. Safety from accidents in the workspace, especially from electrical shocks, slippery surfaces, and entanglements in loose hoses and equipment.

I. Provisions for effective supervision and OSHA-specified personnel air monitoring for exposure during the work.

J. Engineering systems that will minimize exposure to fibers in the workspace, including the exact locations, numbers, sized, and types of HEPA-filtered exhaust fans.

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

A. The contractor shall provide the required written pre-notification to EPA, SCAQMD, CAL/OSHA, and any other regional, state, and local authority having jurisdiction over the project. Copies of the pre-notifications shall be delivered to the Consultant before any work begins. The Contractor must secure all other permits required for the work, including disposal of asbestos in an approved landfill. These permits must also be delivered to the Owner before any work begins.

B. The Contractor shall provide the necessary follow-up notices that may be required, obtain all permits, and pay all governmental taxes, fees, and other costs in connection with his work. He shall file all necessary plans, prepare all documents, and obtain all necessary approvals of all governmental departments having jurisdiction.

C. The Contractor shall include in the work, without extra compensation, all labor, materials, services, apparatus, and drawings (in addition to contract drawings and documents) to comply with all applicable laws, ordinances, rules, and regulati

D. All materials and work shall comply with the specifications of the NBFU, FM, NEC, UL, local utility companies, and the Board of Health, with the recommendations of the fire insurance rating organization having precedence. When the state and national building codes and contract requirements are in excess of the applicable codes, rules, or regulations, the contract provisions shall be given precedence, unless the Consultant grants an exception.

E. The Contractor shall comply with the requirements of the following regulations, and maintain a copy of each of these at the work site:
   1. U.S. Department of Labor, OSHA Asbestos Regulations (29 CFR 1926.1101 and 29 CFR 1910.134(b).
   2. U.S. EPA National Emission Standard for Asbestos (40 CFR 61, subpart M)
   3. South Coast Air Quality Management District (SCAQMD – Rule 1403.
   4. NESHAPS Labeling Requirements.

F. Erect OSHA-specified warning signs around the workspace and at every point of potential entry from the outside including the entrance to the Decontamination Facility's Clean Room. The signs shall conform to OSHA requirements with the words "Danger, Asbestos Hazard, and Do Not Enter". The warning signs shall be bright color so that they shall be easily noted. The size of the signs and their lettering shall be no less than OSHA requirements.

G. The Contractor shall also provide OSHA and DOT-required labels as well as NESHAPS labeling requirements for all plastic bags and drums utilized to transport contaminated material from the work areas to the EPA-approved disposal landfill.

H. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn workers and visitors of the hazard of asbestos exposure. Also post in a prominent and convenient place (e.g. the Clean Room of the Decontamination Facility) for the workers' use a copy of the latest applicable regulations of OSHA, EPA, and NIOSH, and a copy of these Specifications and the applicable drawings.

1.11 SUBMITTALS DURING THE WORK

Submit at least two copies of the following items to the Consultant (See also Section 1.24).

A. Security and safety logs showing names and social security numbers of persons entering the workplace, date and time of entry and exit, records of any accident, emergency evacuation, and any other safety or health incident. These logs shall be provided to the Consultant and the Owner on a daily basis.

B. Disposal certificates. Copies shall be submitted on a weekly basis with completed original certificates submitted upon receipt from the landfill. Manifests shall indicate the area where the waste was located prior to removal.

C. HEPA unit static pressure differential readings daily.

D. Monitoring results as conducted by the Contractor's Representative shall be submitted on a daily basis to the Consultant.

E. Contractor shall provide written inspection reports on all respiratory equipment to the Consultant on a daily basis.

F. Recordings/printouts of negative pressure manometer readings inside containment shall be submitted on a daily basis to Consultant.

1.12 PROTECTION OF PERSONS AND PROPERTY

A. General Safety Requirements

1. The Removal Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with his work. The Removal Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury or loss to (1) all employees in the work area and other persons who may be affected thereby, (2) all the work and all materials to be incorporated therein, and (3) other property at the Project Site and adjacent thereto. The Removal Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and orders of any public authority bearing on the safety of persons and property and their protection from damage, injury or loss. The Removal Contractor shall promptly remedy all damage or loss to any property caused in whole or in part by the Removal Contractor, any Subcontractor, any Sub-Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone of whose acts any of them may be liable, except damage or loss attributable to the acts or omissions of the Owner or Consultant, or any directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Removal Contractor. The Removal Contractor shall be responsible for the protection of any finished work from damage or defacement by his operation. The foregoing obligations of the Removal Contractor are in addition to the Removal Contractor's obligations under Paragraph 8.
2. Life Safety Systems: The Removal Contractor shall assess and control the real or potential impact of his actions upon the Owner's life safety systems (e.g. smoke detectors, sprinkler systems, etc.) Coordination must be established prior to any action on the part of the Removal Contractor, and is subject to modification by the Owner at any time based on the Owner's assessment of risks to the function of the life safety systems associated with the Removal Contractor's actions.

B. The Removal Contractor shall establish an effective safety program in accordance with the requirements set forth in OSHA Part 1926 – Safety and Health Regulations for Construction; Subparts A through Z.

1.13 FIRE PROTECTION AND FIRE PREVENTION

A. Permits: The Removal Contractor shall obtain any permits necessary from the applicable departments of the municipality, including but not limited to the City Fire Department. The permits shall be obtained prior to storage or installation of Removal Contractor's materials on the Owner's property.

B. Smoke Alarms: Smoke detection systems consisting of above-ceiling smoke detectors wired to a central junction panel may be found in the work area. The systems will remain in operation throughout the removal project unless otherwise agreed in advance by the Owner. The Removal Contractor shall seal the system as follows:

1. Notify the Building Security Department at least 24 hours in advance of contact with any component of the system.

3. Once the detectors are exposed by removal of the ceiling, wipe each detector with a damp cloth and seal watertight in a bag or plastic sheeting.
4. Seal the junction panel watertight in a plastic sheet.
5. Removal Contractor shall not use the system's wiring for support of equipment such as lights and shall decontaminate all system components as specified.

C. Fire Protection

1. The local Fire Department and Department of Building and Safety shall be invited by the Removal Contractor to familiarize themselves with the project and to keep their preplanning tactics concurrent with the progress of the work.
2. Water supply for fire protection, either temporary or permanent, shall be made available as soon as combustible materials arrive at the site. There shall be no delay in the installation of fire protection equipment. Standpipes shall be maintained in conformity with the progress of the building activity in such a manner that they are always ready for fire department use.
3. Adequate temporary fire protection shall be provided. Ample multi-purpose dry chemical portable fire extinguishers, having extinguishing ratings of at least 4A: 60BC shall be distributed throughout the premises. Pressurized water extinguishers of 2½-gallon capacity shall supplement the multi-purpose dry chemical extinguisher where welding and cutting operations are conducted. Small rubber-lined hose, with adjustable shut-off nozzles, shall be available as soon as hydrants or standpipes are ready and shall be connected to outlets in areas where construction is in progress. Fire fighting equipment shall be conspicuously located and readily accessible at all times, and be maintained in operating condition.
4. The Contractor shall be responsible for training his workers in the safe and proper use of portable fire extinguishers. A fire-fighting program is to be followed throughout all phases of construction and demolition work involved.
5. Temporary telephones or an alternate system as required by the Fire Department shall be installed prior to the start of construction for use in transmitting fire alarms. Inform all personnel as to their location and use. Post the emergency phone number of the local fire department near all telephones.
6. Access for the fire department shall be provided and shall be maintained readily accessible at all times. At all times existing elevators, including Removal Contractor's designated elevators shall be provided with access to permit fire department use for emergency operations.

D. Fire Prevention

1. Flammable and Combustible Liquids
   a. Only approved containers and portable tanks shall be used for storage and handling of flammable or combustible liquids. All containers and tanks shall be Underwriter's Laboratories listed. Safety cans shall be equipped with flame arresters.
   b. Flammable and combustible liquids shall be kept in closed containers when not actually in use.
   c. No more than one day's working supply shall be allowed inside the building at a time. Flammable or combustible liquids shall be stored in approved flammable liquids storage cabinet with no more than 60 gallons of such liquid stored in any one cabinet. No more than three storage cabinets are to be located in a single storage area.
   d. Conspicuous and legible signs prohibiting smoking or use of open flames shall be posted in areas where the liquids are being dispensed, used, or stored.
2. Compressed Gas Cylinders
   a. Valve protection caps shall be in place when compressed gas cylinders are transported, moved, or stored.
   b. Compressed gas cylinders shall be secured in an upright position at all times.
   c. Oxygen cylinders shall be separated from fuel gas cylinders during storage. Separation shall be at least 20 feet or, if separation by this distance is not possible, the cylinders shall be separated by a five-foot high partition having a fire resistance rating of at least 30 minutes.

d. Cylinders shall be kept at a safe distance and shielded from welding or cutting operations. Cylinders shall not be placed where they can contact an electrical circuit.

e. Storage of compressed gas cylinders shall be limited to the absolute minimum. Conspicuous and legible signs prohibiting smoking or use of open flames shall be posted in areas where oxygen or fuel gas cylinders are stored.

3. Hazardous Operations

a. Hazardous operations shall not be performed until the necessary special fire protection (e.g. portable fire extinguisher, small hose) is in service.

b. Cutting and welding operations shall conform to the requirements of the local fire prevention code. A permit system shall be used for cutting and welding operations on the job site under the supervision of a person having a Certificate of Competency issued by the Fire Department. A permit shall not be issued until (1) it has been determined that cutting and welding can be safely conducted at the desired location, (2) combustibles have been moved away or safely covered, and (3) a watchman with extinguisher is posted for the duration of the work, and for 30 minutes thereafter, to see that sparks or drops of hot metal do not start fires. Additional fire watchmen shall be provided during welding or cutting operations where sparks or molten metal may drop several floors.

4. Housekeeping

a. Combustible waste material and rubbish shall not be stored or allowed to accumulate within the building or in the immediate vicinity, and shall be removed from the premised as rapidly as practical, i.e., at least once a day and more frequently if conditions indicate the need.

b. Materials subject to spontaneous ignition such as oily waste and paint rages shall be placed in approved self-closing waste containers after use and disposed of each day.

c. Combustible materials shall be kept at a minimum by implementing a carefully scheduled plan for delivery of such material.

d. If crating and packing materials holding supplies and equipment are combustible, the equipment shall be uncrated and unpacked as soon as possible after arrival at the site. Combustible packing and crating shall be safely disposed.

5. Tarpaulins

a. Only tarpaulins and materials with fire retardant characteristics as permitted by the local fire department (See paragraph A above.) shall be used.

b. When used for a temporary enclosure, the enclosing materials shall be fastened securely so it cannot be blown against heaters or other sources of ignition by winds and drafts.

6. Scaffolding, Shoring and Forms

a. Steel scaffolding or approved fire retardant treated lumber and planking shall be used on both the outside and the inside of the building.

b. Unnecessary accumulation of combustible forms of lumber shall be avoided. Those portions of the building where combustible forms are present shall not be used for storage of other combustible building supplies.

c. Fire extinguishing equipment shall be provided during forming and stripping. Charged hose lines shall meet this requirement.

7. Smoking

a. Smoking shall be prohibited at or in the vicinity of hazardous operations or materials.

b. Where smoking is allowed, safe receptacles shall be provided for smoking materials.

The Removal Contractor shall develop evacuation procedures to be used in the event of an emergency. These procedures shall be reviewed with the Owner and the Consultant before starting the Work.

1.14 ELECTRICAL

A. Safety Requirements

1. A licensed electrician in compliance with the most recent edition of the National Electric Code shall perform all electrical work, unless otherwise provided by OSHA regulations.
2. The non-current-carrying metal parts of fixed, portable, and plug-connected equipment shall be grounded. Portable tools and appliances protected by an approved system of double insulation need not be grounded. All light and power circuits in asbestos removal areas shall be ground fault protected.
3. Extension cords shall be the 3-wire type, shall be protected from damage, and shall not be fastened with staples, hung from nails, or suspended from wires. Splices shall have soldered wire connections with insulation equal to the cable. Worn or frayed cords shall not be used.
4. Safe lighting equipment shall be provided with a preference for floodlights rather than indiscriminate use of unprotected lamps strung on temporary wiring. Exposed bulbs shall be guarded to prevent accidental contact. Temporary wiring shall be properly insulated and substantially supported. Circuits shall be properly designed and fused. All temporary lighting inside of asbestos removal areas shall be waterproofed.
5. Receptacles for attachment plugs shall be approved, concealed contact type. Where different voltages, frequencies, or types of current are supplied, receptacles shall be of such design that attachment plugs are not interchangeable.
6. Each disconnecting means for motors and appliances and each service feeder or branch circuit at the point where it originates shall be legibly marked to indicate its purpose.
7. The Removal Contractor shall coordinate all power requirements including Ground Fault Interrupted (GFI) panel design and extension cord requirements, with the Building Manager and Consultant.
8. The Removal Contractor shall install and supply at no additional charge all AC power and extension cords for the Resident Hygienist to collect all area and final air clearance samples.

1.15 SITE SECURITY

A. Requirements: Security for the project shall be the responsibility of the Abatement Contractor and be coordinated with the General Contractor.

1.16 SCAFFOLDING, RIGGING AND HOISTING

A. Unless otherwise specified, the Work shall include providing all scaffolding, rigging, hoisting, and services necessary for accomplishing the removal and reinstallation work specified herein. The Removal Contractor shall remove all equipment from the premises when no longer required.

1. Scaffolds (General)
   a. Scaffolds shall be erected on sound, rigid footing, capable of carrying the maximum intended load without settling or displacement.
   b. Scaffolds and their components shall be capable of supporting without failure at least 4 times the maximum intended load.

c. Guardrails and toe boards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats.

1.17 EMERGENCY PRECAUTIONS

A. The Contractor shall establish emergency and fire exits from the work area for the workers and building occupants. All emergency exits which must pass through a work area shall be equipped with two (2) sets of protective clothing and PAPR respirators continuously charged at all times.

B. Contractor shall notify only Owner and parties that are required by law to be notified. Owner and consultant shall determine if any agencies other than those required by law are to be notified.

C. The Contractor shall be prepared to administer appropriate first aid to injured personnel at the site after decontamination. Seriously injured personnel shall be treated immediately in the work area or evacuated without performing decontamination. When an injury occurs, the Contractor shall stop work and implement fiber reduction techniques (e.g. water spraying) until the injured person has been removed from the work area.

D. Before the Contractor starts actual removal of asbestos materials, he shall notify the Owner's building management as to the danger of entering the work area, and they shall also be invited to attend an informal training program to be conducted by the Contractor to provide information regarding abatement activities, decontamination practices, etc. The Contractor shall make every effort to help the Owner form plans of action should their personnel need to enter the contaminated area.

1.18 RESPIRATORY PROTECTION

A. The Contractor shall provide all worker, foremen, superintendents, authorized visitors, and inspectors personally issued and marked respiratory protective equipment approved by NIOSH (including only R series rated filters.) When respirators with disposable filters are employed, the Contractor shall provide sufficient filters for replacement as necessary by the worker or authorized visitor. Filters shall be disposed of as contaminated waste.

B. Instruct and train each worker involved in asbestos abatement or maintenance and repair of friable asbestos-containing materials in proper respiratory use and required that each worker always wear a respirator, properly fitted on the face in the work areas from the start of any operation which may cause airborne asbestos fibers until the work areas is completely decontaminated. Use respiratory protection appropriate for the fiber levels encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

C. Air-purifying respirators with disposable filters shall only be allowed as defined in Part 3.

D. PAPR's shall be used as long as 0.5 f/cc is not exceeded in the work area. If exceeded, all work inside the Work Area shall stop and corrective actions will be required until the fiber levels are reduced to less than 0.5 f/cc. Half face air purifying respirators may be used only during non-friable asbestos abatement, preparation work, installation of critical Barriers, and tear down of the containment.

E. Unless otherwise permitted, respiratory protection as specified herein shall be worn at all times, including preparation of the work areas, loading and unloading of waste containers in the work area or at the transport truck, and cleaning of the work area.

F. Facial hair such as beards, long sideburns, and moustaches, which interfere with the seal of air purifying type respirators, is prohibited. Workers with eye contact lenses must wear protective goggles.

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

1. Respiratory protection equipment shall be inspected and decontaminated on a daily shift basis in accordance with OSHA 29 CFR 1910.134(b).
2. HEPA filters for negative pressure air filtering respirators shall be changed upon each exit from containment.
3. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower while going through decontamination procedures.
4. Airline respirators with HEPA filtered disconnect shall be disconnected in the equipment and worn into the shower. Powered air purifying respirator face pieces shall be worn into the shower. Filter/power pack assemblies shall be decontaminated in accordance with manufacturer's recommendations.
5. Respirators shall be stored in a dry place and in such a manner that the face piece and exhalation valves are not distorted.
6. Organic solvents shall not be used for the washing of respirators.
7. Whenever respirator design permits, workers shall perform a positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow (using methods specified by the manufacturer) every four hours of use and each time the worker enters or exits the work area. The Contractor shall maintain written logs of these tests.
8. The Contractor shall furnish to the Consultant written documentation that each worker is medically approved to wear respirators and has been properly trained in their use, inspection, care, maintenance, and fit testing pursuant to the Contractor's written Respirator Plan. (Reference Submittal Section 1.25.)
9. Breathing air supply systems shall conform to the USEPA NIOSH Document No. EPA-560-OPTS-86-0001 (April, 1986) entitled "A Guide to Respiratory Protection for the Asbestos Abatement Industry."

H. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, the more stringent requirements must be met.

OSHA U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910, Section 1001 and Section 1910.134, 29 CFR 1926.1101.

CSA Canadian Standard Association, Rexdal, Ontario, Standard Z180.1-1978, "Compressed Breathing Air."

ANSI American National Standard Practices for Respiratory Protection, ANSI Z88.2-1980.

NIOSH National Institute for Occupational Safety and Health

1.19 PROTECTIVE CLOTHING

A. Provide to all workers, foremen, superintendents and authorized visitors and inspectors protective disposable clothing consisting of full body coveralls, head covers, gloves, 18-

inch high boot-type covers or reusable footwear, and eye protection in accordance with 29 CFR 1926.1101(3)(I). Sufficient disposable clothing shall be continuously supplied in the decontamination facility for workers, consultant, and inspectors.

B. Provide hard hats and safety shoes as required by job conditions and safety regulations for all personnel entering the containment.

C. Reusable footwear, hard hats, and eye protection devices shall be left in the "Contaminated Equipment Room" until the end of the asbestos abatement work, at which time they shall be disposed of as ACM waste or transferred to another work area by methods approved by the consultant.

D. All disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workplace to the outside through the decontamination facility.

1.20 ENCLOSURES, SHOWERS, AND TOILETS (DECONTAMINATION FACILITIES)

A. Provide decontamination facilities located in an area approved by the Consultant.

B. The Decontamination Enclosure System for workers and visitors shall consist of three adjoining rooms that are separated by air locks (see below definition) as follows: Clean Room at entrance followed by Shower Room, followed by and Equipment Room, leading to the Work Area.

C. The facility shall be installed prior to erecting protective coverings and before disturbing any ACM. The Owner may make available existing toilet facilities to the Contractor where possible. Where not possible, the Contractor shall provide and properly maintain portable service.

D. The Decontamination Facility shall be constructed using 2x4 stud framing and ½" plywood attached for walls (or other suitable and approved set-up), and one layer of 6-mil poly sheeting attached for a ceiling. The interior surfaces of the walls, floor, and roof/ceiling shall then be covered with an additional layer of 6-mil poly sheeting sealed water and airtight with duct tape at all overlapping seams.

E. The entire floor of the Decontamination Facility shall be covered with two layers of 6-mil poly sheeting turned up 12-16" on the wall sides. The upper layer of floor poly sheeting shall be replaced as wear necessitates.

F. An Air Lock is a system permitting ingress and egress without permitting air movement. It consists of two curtained doorways at least eight feet apart where space permits. Each curtained doorway shall be constructed by placing three overlapping sheets along the top of the doorway, securing each along the top of the doorway. The first and third sheets shall be secured on one side of the doorway and the middle sheet shall be secured on the other side of the doorway. There are no swinging/closing doors between airlocks. The doors (curtains) shall be approximately three feet wide.

G. Provide benches and lockers for storage of street clothes and respiratory equipment of workers in the clean room. Also provide in the same room uncontaminated disposable protective clothing and equipment in sufficient quantities for all workers and visitors. Workers and visitors to change from street clothes to disposable protective clothing and gear prior to entering the contaminated area shall use this room. The room shall be adequately sized for such purposes.

H. Provide in shower room facilities with hot and cold water so arranged to provide complete showering of workers and visitors as they exit from the contaminated area. Connect the

shower water drains to a leak-proof pump and commercially manufactured filtering system consisting of several filters in series, including a 5-micron final filter, and an adequately sized pump. Discharge from this system shall be to a location coordinated with the building management. Used water filters shall be packaged and disposed of as asbestos waste. Make provisions to prevent any contaminated run-off from the shower room. The shower room facilities and size shall be adequate to allow decontamination and thorough washing of all the workers and visitors within the 15-minute escape time. Soap and clean dry towels shall be provided in sufficient quantities for all personnel.

I. Provide the equipment room with storage for contaminated clothing and equipment. In this room workers and visitors shall dispose of their disposable protective clothing (except respirator) as they prepare to enter the shower room. Adequate quantities of clean, protected waste bags, filters for the HEPA vacuums and exhaust units, and other tools and equipment necessary for the work shall be stored in this room. Waste containers and excessive quantities of equipment shall not be stored in this room.

J. Viewing ports: At least one view port is to be installed for any containment where asbestos abatement activities are underway regardless of size. Multiple viewing ports are to be installed for large containments or where continuous view is obstructed.

K. Cleaning: The Decontamination Facility shall be cleaned using a HEPA-filtered vacuum at least once each shift, or more frequently if need to prevent residue accumulation.

L. Prohibitions: Smoking, drinking, or eating shall not be permitted in the Work Area or Decontamination Facility. Personal equipment such as radios or flashlights shall not be permitted in the Work Area, Shower Room, or Equipment Room unless they can be washed in the shower.

M. The Contractor shall post or have available the following items in the Clean Room of the Worker Decontamination Facility:
   1. A copy of the U.S. Environmental Protection Agency Regulations for Asbestos, 40 CFR 61 Subparts A and M; a copy of OSHA Asbestos Regulations, 29 CFR 1926.1101; a copy of South Coast Air Quality Management District Rule 1403.
   2. A list of telephone numbers and addresses for local hospital, emergency squad, local fire department, and the name of the designated Building Management staff members.
   3. A copy of the asbestos abatement specifications and drawings.
   4. Name of the competent person and list of names of contractor's employees who are authorized to enter the regulated area.
   5. Contractor's name, list of Contractor's organization chain of command at the construction site, and phone number of responsible representative who may be reached 24 hours per day.
   6. A telephone and/or means of contact to emergency personnel, as well as continuous contact inside the work area.
   7. Signs as required by 29 CFR 1926.1101 (k) (7) (ii).

N. Ensure that barriers and plastic linings are effectively sealed and taped at all times, and that the shower room is watertight. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect the facility at the beginning of each work period. The Consultant shall also be allowed to use smoke generators to test effectiveness of barriers, flow of air through the Decontamination Facility, and the HEPA-exhaust systems.

O. Establish and maintain emergency and fire exits from the work areas satisfactory to local fire officials and the Consultant. Exits shall be checked daily for exterior blockages or impediments to exiting.

1.21 PERSONNEL PROTECTION AND DECONTAMINATION

A. Provide all personnel throughout the abatement process with the specified protective clothing and respiratory protection. Ensure that all personnel entering and leaving the workplace follow the following procedures:

1. Entering from the outside: Change from street clothes into the protective clothing and clean protective gear, go through the Shower room into the Dirty Equipment Room, pick up equipment and tools and enter the Work Area.
2. Exiting from the Work Area: Dispose of all protective clothing into plastic bags labeled for asbestos waste. Do not take off the respirator, but while still wearing the respirator enter the shower and shower thoroughly. Remove the respirator while still in the shower and wash and wipe it thoroughly to decontaminate it. After drying, enter the Clean Room; store the decontaminated respirator in the designated space and dress into street clothes.
3. Post written procedures in the work place and train all personnel in the procedures for the evacuation of the injured and the handling of potential fires. Provide aid to a seriously injured worker without delay for decontamination. Make provisions to minimize exposure of rescue workers and to minimize spreading of contamination during evacuations and fire procedures.
4. The Contractor shall instruct all employees and workers in the proper care of their personally issued respiratory equipment, including daily maintenance, sanitizing procedures, etc.
5. Contractor's project supervisory personnel shall inspect all respiratory equipment at the beginning of each work period, including breaks and lunch periods. Written records of these inspections shall be maintained and provided to the Consultant (refer to Section 1.25.) During preparation work prior to actual removal, contractor may use half face respirators. During removal and cleaning of friable ACM, Paper's at a minimum will be required.

1.22 ASBESTOS WASTE DISPOSAL PROCEDURES

A. It is the responsibility of the Contractor to determine current waste handling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The Contractor must comply fully with the regulations and all U.S. Department of Transportation and EPA requirements, and state and local regulations.

B. The Contractor shall document actual disposal of the waste at the designated landfill by completing a written Disposal Certificate, signed by the landfill operator, and forwarding the original to the Consultant.

C. Consultant approval of Contractor payment requests may be denied until receipt of such Disposal Certificates. The following procedure shall be followed:

1. <u>Prior to Start of Work</u>
   a. Letter from abatement contractor to consultant identifying intended waste hauler(s) and landfill(s). Include all licenses, permits, authorizations, etc.
2. <u>During Work</u>
   a. Contractor to document number of waste bags removed in each area.
   b. Chain-of-custody letter or form to be signed by abatement contractor, Hauler, and landfill operator, for each shipment.
   c. Shipping manifests as required by code, per shipment.
   d. Weight tickets or other appropriate documentation of proper disposal to be provided to the Landfill operator, per shipment.
3. <u>After Completion of Work</u>
   a. Letter from Contractor to Consultant stating that all shipping and dumping was done in accordance with all applicable codes, laws and regulations and in accordance with specifications.

D. Definition: Wastes are defined as all asbestos-containing or potentially asbestos-containing materials or other items which have not been completely cleaned or sealed to the satisfaction of the Consultant while inside the work area, and must be removed from the job site. Asbestos wastes may include building materials, insulation, disposable clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, contractor equipment, or other materials designated by state or local authorities or the Consultant, or which have been potentially contaminated with asbestos and have not been fully cleaned inside the work area by vacuuming followed by thorough washing.

E. Waste Packaging: All waste material shall be promptly placed in 6-mil polyethylene bags as it is generated. A sufficient number of waste bags shall be located in the immediate work area, and in the Equipment (dirty) room of the Worker Decontamination Facility. The bagged material shall be placed in a second 6-mil polyethylene bag in the load out chamber. The contractor shall count the bags and estimate the total volume leaving the work area, and maintain a written record of such (waste manifest) (Reference Section 1.22K-3). (See also following Paragraphs)

F. Removal of Waste from the Work Area: Bags containing waste material must be washed and then placed in second bags for removal to the storage container and subsequent transport to the disposal facility.

1. The loaded bags must be checked for leakage and then placed in the washroom by workers inside the work area.
2. Once in the washroom, wet cleaning shall clean external surfaces of contaminated containers and equipment a second time.
3. The cleaned containers of waste and equipment shall be placed in uncontaminated leak tight-labeled 6-mil plastic bags (or 6-mil sheeting if physical characteristics necessitate and permit). Air volumes shall be minimized, and the bags or sheeting shall be sealed. Items that may puncture or tear the plastic bags or sheeting shall be placed in a hard wall container such as a drum, and then sealed.
4. All bags will be labeled prior to removal from the work area. SCAQMD's interpretation is that all bags (non-hazardous and hazardous) be labeled with a generator label depicting the owner name and address.
5. The clean recontainerized items shall be moved into the airlock for subsequent transfer to a holding area. The washroom workers shall not enter this airlock or the work area until waste removal is finished for the period.
6. Workers who have entered from uncontaminated areas with appropriate personal protective equipment shall remove recontainerized items and cleaned equipment from the airlock to the holding area.
7. The recontainerized items of waste and cleaned, bagged equipment shall be placed in open top, watertight plastic carts or drums. These carts or drums shall be held in the holding area pending removal. The carts or drums shall be HEPA-vacuumed and wet-cleaned immediately following the removal of the containers of waste from them, and the location of where they are emptied shall also be HEPA-vacuumed.
8. The exit from the waste decontamination facility shall be monitored and secured at all times to prevent unauthorized entry.

G. Waste Container Storage: Sealed waste bags may be temporarily stored in a pre-designated and approved outside area, until a truckload quantity is obtained. The temporary storage area shall be prominently identified and posted with signs, and waste containers shall be covered with polyethylene sheeting or otherwise protected from further contamination.

H. Waste Removal Scheduling: All waste containers shall be decontaminated and removed from the work area before final cleanup is started and isolation barriers are taken down. Once a truckload of waste containers has accumulated, the Contractor shall arrange for

transportation to the disposal site. Waste shall not be stored in the worker or waste decontamination facilities. Outside bag storage must be monitored and secured at all times to prevent tampering. Storage must be in secure areas.

I. Waste Transportation and Disposal Regulations: It is the responsibility of the Contractor to determine and unsure that he is complying with: 1) the current waste handling regulations applicable to each work site; and 2) the current regulations for transporting and disposing waste at each ultimate disposal landfill. He must comply fully with these regulations and with all U.S. Department of Transportation, State, EPA and all federal and local requirements.

The Contractor (or his Subcontractor) at no additional cost shall maintain a valid solid waste transportation registration issued by the California Department of Health Services Toxic Substance Division; and obtain, complete, and fully comply with any other local hazardous waste manifesting requirements. A copy of any manifest forms shall be sent to the Consultant after disposal is completed and all required data and signatures have been inserted. (Manifest to have original of ACM waste)

J. Asbestos Hauling: Transportation methods shall comply with the provisions of EPA Title 40, Part 61, Subpart M, Title 22 of the California Administrative Code, Division 4 Environmental Health, Chapter 30, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes, and with any hazardous waste regulations for temporary storage, transport, and disposal if such codes are enforced in states where the waste shall be stored, transported or disposed of.

K. Waste Container Removal and Disposal Procedure:
1. The costs for waste packaging, transportation, and approved landfill disposal (plus all related record keeping) shall be included in Contractor's Prices.
2. The contractor shall package, label, and remove all asbestos waste as specified in the above Sections. Packaging shall be accomplished in a manner that minimizes waste volume, but insures waste containers shall not tear or break. All material shall be bagged in a minimum of two (2) 6-mil labeled bags.
3. The Consultant must observe removal of all waste containers to verify their condition and certify the total volume of waste material (to the nearest cubic yard). The Contractor shall then insert the quantity on the Disposal Form/Waste Manifest, and give the original of these forms to the waste hauler for transport to the landfill operator for signature.
4. The Contractor shall provide legal transportation of asbestos wastes to the ultimate disposal landfill. The Contractor shall verify actual delivery, receipt, and disposal of each load of waste at the designated landfill by completing a Disposal Certificate, obtaining the landfill operator's signature, and forwarding the original to the Consultant.
5. Waste must be disposed at a site conforming to 40 CFR 61.156.

1.23 ASBESTOS WASTE TRANSPORTATION GUIDELINES

The following guidelines are hereby communicated to the Contractor to ensure the Contractor properly selects and effectively monitors the performance of the Asbestos Waste Transporter.

A. Asbestos Waste Transportation Permits and Labels
1. The Waste Transporter shall possess, and all vehicles shall be labeled with, U.S. Department of Transportation (DOT) identification numbers assigned to the Waste Carrier by the DOT in accordance with DOT Federal Motor Carrier Safety Regulations (49 CRF Part 390). DOT ID numbers are required for interstate transport.
2. The Waste Transporter shall also possess asbestos transportation permits where required by any state law. A permit will be required for transportation of waste

from the state in which the waste was generated, if said state has permit requirements. Current federal regulations do not require a hauler to obtain a special asbestos permit in order to transport asbestos waste through multiple states en route to a permanent landfill.

B. Asbestos Waste Transport Vehicles

1. All motor vehicles used to transport asbestos waste should have records, which indicate a history of regular inspections, maintenance, and repairs. The vehicle must be operated and maintained in a safe and proper working order at all times. Vehicles likely to break down or cause an accident shall not be used.
2. All asbestos waste transport vehicles must utilize enclosed transport compartments. Open top bins may only be used when the work method has been pre-approved by the consultant. Compartments must be sufficient to contain the transported waste, prevent damage to the waste containers, and prevent fiber release. Vehicles that utilize compactors to reduce waste volumes shall not be used.

C. Accident Contingency Plan/Consequence Management

1. The Asbestos Transporter shall maintain an Accident Contingency Plan designed to effectively manage any roadway incident leading to the release of asbestos materials from the transport compartment. Such a plan should address procedures for the following key elements (at a minimum):
   a. Emergency notification of local and state agencies in the event of an incident.
   b. Emergency notification and response by local asbestos remediation companies.
   c. Guidelines for establishing a controlled area at the incident site.
   d. Guidelines for site remediation.
   e. Guidelines for subsequent off-loading and transfer of waste if transport compartment of vehicle is effectively disabled.
2. The Asbestos Waste Transporter shall maintain pollution liability insurance. This insurance shall be adequate to protect the insured against financial liability resulting from accidental asbestos releases and exposures, which arise from a roadway incident and result in bodily injury, property damage, or environmental harm.
3. The Asbestos Waste Transporter shall indemnify and hold the Owner/Generator and its agents harmless from any consequences arising from an asbestos release incident during the transport of asbestos to the final disposal site.

1.24 SUBMITTAL REQUIREMENTS

The following items must be submitted per the requirements of Section 01350 in time for review prior to the start of work. The submittals will be bound in a three ring (D ring) view binder. Tab dividers with a table of contents will separate the categories. The first tab and the last three tabs will be left blank to make room for final close-out documents.

A. Pre-Abatement Submittals

1. Emergency Phone List -24 hour access
2. Contractors License – Number and Classification
3. DOSH Registration Number
4. Insurance - Liability and Workers Compensation
5. Hazardous Hauler Information – EPA I.D. #'s etc.
6. Landfill – Name, Location, and EPA I.D. #
7. AQMD – Notifications, Equipment Registrations.
8. Company Asbestos Operating Procedure
9. Injury and Illness Protection Plan

10. Hazard Communication Plan
11. Respiratory Protection Plan
12. Worker Training Certificates
13. Worker Medical Certificates
14. Worker Respirator Fit Tests
15. List of Equipment – On-site
16. MSDS – Material Safety Data Sheets

B. Post-Abatement Submittals
1. Daily Sign-in Log
2. De-Con Entry Sign-In Log
3. Results of On-Site Monitoring
4. AQMD Revisions
5. Copies of Waste Manifests

PART 2 – PRODUCTS

2.01 GENERAL REQUIREMENTS

A. The Contractor shall deliver all material and equipment to the site in the original containers having the name of the manufacturer and details for proper storage and usage.

B. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the Work Area in a manner, which shall not interfere with the operations of the Owner.

C. The Consultant and the Owner must approve unloading and temporary storage sites and transfer routes in advance.

D. Damaged or deteriorated materials may not be used and must be promptly removed from the premises. Material, which becomes contaminated, with asbestos-containing material shall be packaged as ACM and legally transported and disposed of in an approved, secure, asbestos landfill.

2.02 MATERIALS, TOOLS, AND EQUIPMENT

A. All materials, tools, and equipment must comply at a minimum with this Specification and relevant federal, state and local codes.

1. HEPA-Filtered Exhausts – Air inside each asbestos removal area shall be exhausted to the atmosphere (building exterior) through a High Efficiency Particulate Air (HEPA) filter.

   One or more HEPA-filtered portable exhaust units shall be provided for each work area, of sufficient total capacity to provide at least four complete changes of air per hour, and an inward velocity through all openings to the work area of at least 200 fpm, and a static negative air pressure of at least 0.02 inches of water. Replaceable pre-filters shall precede the HEPA-filter, and the unit must be designed such that it cannot be operated unless the HEPA-filters are in place.

   The units must also be designed with lights or alarms, which indicate that the filters are properly installed and functional, and which determine when the filters must be changed. Flexible hoses (ducts) of sufficient length must be provided to allow the units to discharge outside of the buildings. Ducts shall exit through metal collars in a plywood insert. Exhausts with other types of particulate

cleaning systems, such as electrostatic precipitators, shall not be allowed. (Reference Section 1.24b-2)

2. Plastic Sheeting and Bags – Shall be polyethylene or equivalent with a thickness of at least 6 mil for all applications. Both transparent and opaque plastic will be required as directed by the Consultant. Waste disposal bags shall be of 6-mil thickness with appropriate warning labels as described in Section 1.22 E.
3. Encapsulants – Encapsulating agents shall be approved by the Owner and must be compatible with the replacement materials. The encapsulants must be UL tested.
4. Wetting Agent or Surfactant – Shall be 50% polyoxyethylene ester and 50% polyoxyethylene ether or equivalent, mixed in the proportion of one-ounce surfactant per five gallons of water. The material must be odorless, non-flammable, nontoxic, non-irritating, and non-carcinogenic. It shall be applied as a mist using a low-pressure airless sprayer recommended by the surfactant manufacturer.
5. Tape and Glue – Shall be capable of sealing plastic to finished surfaces without damage when it is removed. The bonding strength and resulting seal integrity must not be affected by mist or water, encapsulating agent, or any other materials used in the work area.
6. Warning Signs and Labels – Shall comply with 29 CFR 1926.1101 (7) (ii), and all other federal, state, or local codes and regulations.
7. Waste Containers and Transportation – Shall be bags as noted in Item No. 2 above, drums or other closed containers, suitable for loading, temporary storage, transit, and unloading of contaminated waste without rupture, or otherwise causing spillage or exposure to persons or emissions to the atmosphere. Transportation methods shall comply with the provisions of EPA Title 40, part 61, Subparts A and B, and with any hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states or cities where the waste will be generated, stored, transported, or disposed of. All containers shall be labeled in accordance with OSHA Regulation 29 CFR 1926.1101(8), NESHAPS, and 49 CFR parts 171 and 172, Hazardous Substances: Final Rule.
8. Respiratory Protection Devices - Shall be NIOSH approved (including only R-series rated filters) and shall comply with all provisions of 29 CFR 1926.1101. Fit testing procedures must comply with 29 CFR 1926.1101 Appendix C. Documentation of fit testing procedure must be provided. (See Submittal Section 1.25-1).
9. Electrical Equipment – Shall be Underwriters Laboratory listed and approved, and shall have ground fault circuit interrupt protection, which has been installed by a licensed electrician.
10. Ladders or Scaffolds – Shall be OSHA-approved and be of sufficient dimensions and quantities so that workers, the consultant, and other inspectors can easily and safely access all work surfaces. Scaffold joints and ends shall be sealed with tape to prevent incursions of asbestos fibers. All ladders at the worksite will be properly "tied-off".
11. Hand Power Tools – Shall be equipped with HEPA-filtered local exhaust ventilation if used to drill, cut into, or otherwise disturb ACM.
12. Brushes – All brushes shall have nylon bristles. Wire brushes may be used upon specific approval by the Consultant.
13. Lumber/Plywood – All lumber and plywood supplied by and used by the Contractor shall be fire retardant, unless authorized by the Consultant.

PART 3 – EXECUTION

3.01 PRE-ASBESTOS ABATEMENT PREPARATIONS

The Contractor shall prepare the work area as described in this section. Preparation work shall be performed according to the following general sequence of steps and procedures to insure that proper containment and protection systems are installed prior to any work, which could generate airborne asbestos fibers.

A. Remove and relocate any non-fixed items (not removed by the Owner) to storage areas designated by the Owner.

B. Isolate, clean by HEPA vacuuming and washing, and seal airtight with two layers of 6-mil poly sheeting and tape, all HVAC system diffusers, grills, and registers in or servicing the work area.

C. Carefully clean all surfaces in the work area, which may be contaminated with any dust or debris by using wet methods and a vacuum equipped with HEPA filter.

D. Cover any openings with a minimum of two layers poly sheeting. Erect any required barriers, coverings, or access platforms; post access restriction signs, seal all openings into the work area; install any temporary access openings; poly all floors and walls; protect and cover all fixed items. Install Decontamination Facility and HEPA exhaust system as described herein.

E. Isolate all electrical systems as directed by the Owner, and provide temporary power and lighting as required for the work area.

F. Obtain Consultant's approval of all preparation work prior to starting removal of asbestos material.

3.02 ISOLATION AND SEALING OF HVAC SYSTEMS

A. Prior to performing any asbestos removal work in an area, the contractor shall make appropriate adjustments to any affected air handling systems to prevent air movement to and from the work area through HVAC or exhaust ductwork, or any other penetrations into the work area. The adjustments shall be pre-approved by the Consultant and the Owner. If HVAC ducts or duct insulation are found to be contaminated, care shall be taken to clean or removed the contamination prior to installation of the HVAC seals. If ducts are to be removed, cleaning of the ducts can be conducted after the seals are placed on the duct openings. Affected HVAC systems shall be de-energized during this process. Filters in affected HVAC systems shall be removed and packaged for disposal as asbestos waste and then replaced with equal filters at the conclusion of the work.

B. Once the above isolation has been made, but before any asbestos-related work has begun, the Contractor shall locate, block, and seal airtight at the work area boundary all supply air ducts, return air ducts, other exhaust ducts, and any other open penetrations into the work area. The seals (air blockage) must have two 6-mil poly coverings. They shall be capable of remaining intact and preventing all air flow for the duration of work in the area. After installation, the Consultant must individually approve each seal. All ceiling, floor, or wall mounted supply air diffusers, registers, grills, and other HVAAC fixtures shall also be cleaned with HEPA vacuums and then sealed with two layers of 6-mil poly sheeting secured with duct tape. Contractor must provide "lock out" systems on all HVAC equipment, which will be shut off during the removal process.

C. No flow of air out of the work area shall be permitted except via HEPA-filtered exhaust units.

3.03 ISOLATION OF ELECTRICAL SYSTEMS AND INSTALLATION OF TEMPORARY POWER AND LIGHTING

A. The scope of the required electrical isolation and protection work includes isolation and protection of electrical equipment that is in the area from which asbestos must be removed, and could therefore possibly become a hazard through contact or water spray short-circuiting. Shutdown of electrical circuits shall include providing labor to monitor, inspect, and service temporary power circuits, lighting, and equipment as required by local codes and regulations. Contractor must provide "lock out" systems on all electrical panels or equipment, which will be shut off during the removal process.

B. Temporary light shall be provided by the Contractor in the work area where asbestos removal is performed. The Contractor's licensed electrician as mutually agreed upon by Owner and Contractor and hereinafter referred to, as the Contractor's licensed electrician shall initially inspect the removal work area for the condition of electrical conduit and junction boxes. The purpose of this inspection is to assist the Contractor in the preparation and performance of his work, and to provide for the safety of work crews.

C. All materials and workmanship shall conform to the latest editions of the following codes, standards, and specifications;
   1. National Electrical Code (NEC)
   2. National Bureau of Standards, Handbook H30, National Electrical Safety Code
   3. State and Local codes and all other authorities having jurisdiction
   4. Underwriters Laboratories (UL)
   5. National Board of Fire Underwriters
   6. OSHA

D. Temporary lighting and power systems shall exceed all OSHA, state, and local regulations temporary lighting levels shall exceed OSHA requirements and provide surface lighting for nighttime work.

E. The contractor is responsible for visiting the site (at no additional cost) to investigate existing electrical conditions and isolation requirements.

F. All Contractor costs associated with the isolation of electrical systems and installation of temporary power and lighting must be included in his prices.

G. The non-current carrying metal parts of fixed, portable, and plug-connected equipment shall be grounded. Portable tools and appliances protected by an approved system of double insulation need not be grounded. All light and power circuits in the asbestos removal area shall be ground fault protected.

H. Extension cords shall be the 3-wire type; shall be protected from damage, and shall not be fastened with staples, hung from nails, or suspended from wires. Splices shall have soldered wire connection with insulation equal to the cable. Worn or frayed cords shall not be used.

I. Safe lighting equipment shall be provided with waterproof floodlights. Exposed bulbs shall be guarded to prevent accidental contact. Temporary wiring shall be properly insulated and substantially supported. Circuits shall be properly designed and fused. All temporary lighting inside the asbestos removal area shall be weatherproofed.

J. Receptacles for attachment plugs shall be approved, concealed contact type. Where different voltages, frequencies, or types of current are supplied, receptacles shall be of such design that attachment plugs are not interchangeable.

K. Each disconnecting means for motors and appliances and each service federal or branch circuit at the point where it originates, shall be legibly marked to indicate its purpose.

3.04 ISOLATION OF WORK AREAS AND INSTALLATION OF DECONTAMINATION FACILITIES

A. Work Area Isolation and Protection:

1. The Contractor shall isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area, including, but not limited to, heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation/sealing shall be accomplished by using two layers of 6-mil poly sheeting taped securely in place, or by caulking, including the construction as noted in 3 below. The work area shall be protected and sealed airtight to the extent possible and be subject to the approval of the Consultant.
2. Emergency and fire exits shall be maintained.
3. Isolation Partitions and Barriers – Open doorways, cased openings, windows, air vents, filtration areas, etc. and other openings as mandated by project conditions shall be sealed airtight with temporary structural portions as follows:
   a. Erect wood or metal studs 16" on center and then cover the opening with ½ " plywood sheathing or equivalent on work area side only.
   b. Cover the work side of this partition with a double layer of plastic sheeting with joints staggered and sealed with tape. Edges of the partition at floor, walls, ceiling, and all joints shall be caulked airtight.
4. Shut down and isolate heating, cooling, and ventilating air systems to prevent contamination and fiber dispersal to other areas of the building.
5. All water sources shall be isolated so that there is no possibility that water can be turned on accidentally. All water sources shall be shut off below the sink if possible.
6. Thoroughly pre-clean all dust or debris from any fixed objects, floors, or other equipment within the work area using HEPA vacuuming equipment and wet washing. Do not use brooms, brushes, dry mops, or non-HEPA vacuum cleaners for this precleaning work.

   Seal all seams, joints, covers or casings with tape, and enclose fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape. Provide and install plywood coverings as necessary to protect fixed items, which could be accidentally damaged.
7. Cover floors with a minimum of two independent layers of 6-mil plastic sheeting, turning each layer up onto the wall a minimum of 16" and fasten securely to wall (after all wall criticals are sealed.) Cover walls with two layers of 6-mil plastic sheeting extending to the floor, overlapping the two floor sheets by not less than 12" including the turn-up. All joints in plastic sheets shall be taped and glued in a manner to prohibit air movement, and to prevent passage of water or other liquids. The bottom layer of floor poly shall be securely fastened to the floor to prevent creases or slippage that would pose a hazard to workers. Any floor drains or other openings shall be sealed individually with two layers of 6-mil sheeting and tape and then covered by the remaining two layers of poly. Pits, pumps and other openings shall be covered so as to prevent a tripping hazard and then covered with two layers of 6-mil sheeting. Any pipe insulation shall be covered in two layers of 6-mil sheeting.
8. Install work area HEPA-filtered exhaust systems as previously specified in Section 1.24.
9. The Contractor shall post warning signs in English and Spanish meeting the requirements of OSHA 29 CFR 1926.1101(k)(7)(ii) at the outside doorway to the Decontamination Facility which shall be the only non-emergency entrance to the work area. The Consultant may also request that the Contractor post additional

warning signs around the work area or at other potential entrances or exposure points in accordance with California Proposition 65.

Warning signs shall be readily visible to any person attempting to enter the work area.

3.05 APPROVAL OF PREPARATION WORK

After the asbestos removal work area has been prepared as specified above, the Contractor shall request a formal site inspection by the Consultant. No removal, demolition, or other disturbance of asbestos containing materials, dust or debris shall occur until the Consultant has inspected and approved the site preparation work in writing.

3.06 REMOVAL OF CEILINGS

A. The Contractor shall remove and dispose of suspended ceilings as asbestos waste to obtain access to inspect and seal the removal areas.

B. Ceiling removal work shall not commence until each work area is completely isolated and protected, HVAC and electrical systems are shut down and sealed, and HEPA exhaust system and Decontamination Facility is installed and the work area has been inspected and formally approved by the Consultant.

C. Workers shall wear specified full personal protective equipment (disposable suits and powered air purifying respirator) at all times during ceiling demolition, cleaning, and waste packaging tasks as described below.

3.07 CLEANING OF ASBESTOS CONTAMINATED SURFACES

A. This section pertains to the cleaning of surfaces, which are potentially contaminated with asbestos-containing dust, and debris as identified in the Description of Work or discovered in the performance of the specified work. Such cleaning shall be required to prevent this dust from becoming airborne and posing an exposure risk to building occupants or interfering in air monitoring activities. Cleaning action shall be performed as preliminary exposure control procedures prior to performing other actions which are required. Cleaning shall consist of HEPA vacuuming followed by wet mopping or wiping of surfaces in a manner, which prevents dust generation but effectively rids the surface of all visible debris, dust, film, and grime.

B. Each HEPA vacuum cleaner shall be separately equipped with an airtight securely attached hose of proper length and a collection wand, brush and other special attachments appropriate t the required cleaning tasks. The equipment shall be properly operated at all times and shall contain no air leaks.

C. Cleaning Procedure:
   1. Remove large pieces of debris by hand, and then dry vacuum all surfaces using HEPA filtered equipment and a collection attachment which minimizes dust generation. Surfaces shall be cleaned by working outward from the point of access so that workers do not walk on or disrupt uncleaned surfaces.
   2. Lightly wet the surface of any material that could produce airborne fibers by using an airless sprayer and amended water.
   3. Collect, package, label and dispose of vacuumed material as asbestos waste.
   4. Thoroughly wet wipe or mop all surfaces to remove any remaining dirt or grime, being careful not to wet or damage any electrical equipment, furniture, or other sensitive surfaces.

5. Allow surfaces to completely dry, and then inspect them for any visible remaining dirt or fibrous material.
6. HEPA vacuum any remaining dirt or fibers using an efficient collection attachment.
7. Collect and pump all wastewater through a 5-micron filter (multistage filtration system). Dispose of filtered material and the filter as asbestos waste.
8. Request Consultant to conduct final inspection of cleaning work prior to performing any other specified activities.

3.08 ASBESTOS REMOVAL UNDER GENERAL CONTAINMENT PROCEDURES

A. This section covers the removal of asbestos-containing troweled and sprayed acoustical material, linoleum sheeting, exterior stucco, exterior texture, and window putty and vibration dampers as specified in the documents or as directed by the Consultant.

B. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from friable material prior to and during removal. The amended water shall be applied in sufficient quantity to fully penetrate and saturate the friable material before it is removed. Wetting shall commence up to 8 hours before removal work to ensure effectiveness.

C. Removal methods:
1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant. Removal workers shall wear powered air purifying respirators and protective clothing throughout all removal, cleanup, and waste handling operations.
2. Small test patches of asbestos material shall be wetted and then removed and examined by the Consultant and Supervisor to determine the degree of saturation prior to removing the bulk of the material. With prior approval the Contractor may use removal encapsulants instead of amended water; applied per manufacturers and federal guidelines.
3. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by hand using scrapers or other suitable tools.
4. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil poly disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener approved by the Consultant), and transported to a temporary storage area inside the work area.
5. If the asbestos material is located on surfaces higher than 15 feet above the floor, the Contractor shall provide closed chutes (with maximum incline of 60 degrees from horizontal) or scaffolding for waste containers to prevent dropping material down to the floor during the Project.
6. The Contractor shall repeatedly spray the friable material to prevent it from drying out.
7. Once the majority of the asbestos has been removed, the Contractor shall scrub the surface with a nylon brush or equivalent, and a water spray, and then thoroughly wash it to remove all remaining material.
8. After obtaining written approval of the cleaning from the Consultant, the Contractor shall then seal all substrate surfaces from which asbestos material has been removed with at least one coat of an approved penetrating encapsulant.
9. The Contractor shall minimize contamination of the work floor, the exterior of disposal containers, and all other surfaces within the work area. At the end of

each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.

10. The decontamination facility shall be wet cleaned using wet cleaning methods upon completion of any waste removal. When the worker decontamination facility's shower room alternates as a waste container washroom, the shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
11. The decontamination facility shall be wet cleaned and HEPA vacuumed as appropriate after each shift change and meal break.
12. Excessive water accumulation or flooding or excessive accumulation of debris in the work area shall require work to stop until the water or debris is collected and disposed of properly.

3.09 REMOVAL UNDER MODIFIED CONTAINMENT

A. Modified containments are areas that have been partially protected with polyethylene sheeting and equipped with HEPA exhaust units to facilitate air filtration. The workers decontamination facility shall consist of two rooms as specified in Section 1.20 consisting of a clean room and a dirty room. Modified containments shall be utilized only when removing non-friable asbestos such as vinyl floor tiles and mastic, base cove mastic, transite flues, etc. as specified by the contract documents or Consultant. HEPA exhaust units shall be installed and exhausted to the exterior of the containment and all penetrations (including doors, windows, HVAC, etc.) shall be sealed with poly to prevent fiber migration from the regulated area.

B. If a condition is encountered wherein the fiber count limits of the inside (0.50 f/cc) and outside (0.05 f/cc) of the work areas are exceeded during ACM removal activities and efforts to reduce this prove futile, the contractor shall stop all work and shall remove the ACM using the method of "asbestos removal under general containment procedures, complete with full decontamination facilities."

C. Worker protection will require disposable protective clothing (double suit) and a minimum of Air Purifying Respirators with disposable dual HEPA-filtered cartridges approved by NIOSH.

3.10 REMOVAL OF ASBESTOS-CONTAINING FLOOR TILES AND ASSOCIATED MASTIC

A. Removal Procedure

1. Seal doors, windows, and other openings into the work area with two independent layers of 6-mil poly.
2. Shut down HVAC, as required, for duration of work activities.
3. Remove or cover furniture or fixed objects with 6-mil poly. Protect walls up to a height of 6 feet with one layer 6-mil poly.
4. Install HEPA unit to facilitate air filtration.
5. Workers shall wear disposable coveralls (double suit) and a minimum of air purifying respirators with NIOSH approved asbestos cartridges.
6. Whenever carpets cover the floor tiles or mastic, the carpets shall be removed only under regulated conditions and pre-approved by the Consultant.
7. Removal shall be performed so as to minimize fracturing or cutting of floor tiles (to minimize potential fiber release) by using wet methods and hand scrapers. Heating or the application of dry ice may also be used.
8. Electrical grinding or cutting tools should not be used during the removal operation.
9. Floor tiles shall be double bagged or placed in drums or boxes with appropriate asbestos warning labels and disposed of according to specified regulations.

10. Contractor may use an emulsifiable solvent degreaser or equivalent to ascertain that this solvent is appropriate for the materials to be removed and acceptable to the designated landfill operator.

3.11 REMOVAL OF ASBESTOS-CONTAINING TAR PAPER, FELTS, UNDERLAYMENT, AND TAR SEALANT ROOFING MATERIALS

The following work practice requirements are for the removal/disturbance of asbestos-containing roofing materials, i.e. tar sealants and roofing systems. Mechanical removal practices, other than use of saw cutting, will require full compliance with all SCAQMD Rule 1403 requirements. HEPA vacuuming of roofing surface immediately following removal is required. HEPA vacuuming equipment will be operated in compliance with Rule 1403 (d) (1) (D) (i) (III) provisions.

A. Preparation

1. As required by federal OSHA, CAL-OSHA, and any other applicable federal, state, and local safety agencies, guard rails, scaffolding, rigging, etc. shall be installed as necessary prior to removal activities commencing. Ropes and safety harnesses must be utilized where applicable.
2. Remove all objects not fastened to existing structure from the work area prior to commencing removal activities.
3. Cover all stationary objects and surfaces not intended for removal or stripping of asbestos containing roofing materials. Cover and render air-tight all air passage-ways, such as doors, windows, skylights, air circulation units, vents and registers in the work are, with plastic sheeting, or hard wood barriers with studded support.
4. Confine all debris associated with roofing removal activities and prevent dispersal into the facility structure.
5. Utilize plastic sheeting catch devices secured at the structure foundation to contain incidental falling roofing debris.
6. Warning tape shall be installed surrounding building where debris may accidentally be dislodged during preparation and removal activities. Tape shall remain in place and be inspected daily throughout the removal project.

B. Removal and Handling

1. When cleaning roof surface do not use tools or devices, which could cause debris to become airborne, e.g. brooms, blowers, high-pressure rinse, etc.
2. Adequately wet with amended water the areas to be worked prior to the initiation of the removal process. Amended water will be used continually throughout the work period to ensure that any asbestos-containing material exposed by manual force or saw cutting is wet and remains wet until final disposal.
3. The wetting solution shall be applied with airless spray or low-pressure spray equipment to avoid displacement and dispersal of asbestos fibers. Hose-end sprayers may be used when outside temperatures require more aggressive wetting procedures.
4. All efforts shall be made to manually loosen and remove the roofing material with limited chipping and breaking.
5. Roofing material may be cut into smaller, manageable pieces depending upon mode of transport and disposal.
6. An encapsulant shall be used during the cutting process to prevent asbestos fiber release.
7. All non-friable roofing materials shall be carried to the edge of the roof where off-loading will take place by means of a chute or hoist.
8. Carefully lower asbestos-containing material that has been removed to the ground or a lower floor without dropping, throwing, sliding, or otherwise damaging the asbestos-containing material, or transport the asbestos-containing material to the ground or a lower floor via leak tight chutes or containers when removal occurs more than 50 feet above the ground and the material is not in units or sections.

9. Roofing material must be immediately sealed into airtight containers, covered drop box, or plastic wrapping of at least 6-mil thickness.
10. Immediately following removal of roofing materials from deck apply amended water to entire exposed surface.
11. Remaining wetted asbestos-containing materials, including plastic or wood barriers, shall be placed in leak-tight containers or sealed plastic bags.
12. Maintain on-site storage of encapsulated materials or leak-tight containers within an enclosed storage area prior to transport. Leak-tight containers and encapsulated materials shall not be accessible to the general public.
13. All asbestos-containing waste material shall be placed in leak-tight containers that will not allow said material to escape while moving them from work area to disposal container or transport vehicle.
14. Contractors wanting to dispose of roofing materials via burrito wrap enclosure must provide a letter from the approved asbestos waste disposal site providing information regarding proper burrito wrapping methods and proper methods for unloading the waste from the waste hauling container.

3.12 REMOVAL USING GLOVE-BAG ENCLOSURE

A. Materials:
1. Bags. Bags commercially manufactured specifically for glove bag enclosure removal of asbestos shall be used.
2. Chilled amended water, duct tape, plastic sheeting and waste bags, a minimum of air purifying respirator with HEPA cartridges, disposable coveralls, warning signs, HEPA-filtered vacuum cleaner, and wetable fiberglass cloth will be required.
3. Utility knife, tin snips as required, wire cutters, as required, industrial stapler, nylon brush, and other hand tools will be required.
4. Airless sprayer equipped with approximately 3 linear feet of flexible tubing and wand for insertion into the glove bag.

B. Precautions
1. Maximum temperature of components allowable for glove bag work as specified by glove bag manufacturer.
2. Contain the work area: shut down HVAC, exclude casual personnel, close doors, and install warning signs.
3. Wear personal protection: disposable coveralls and air purifying respirators with HEPA filters.
4. Install modified containment
5. Provide supplementary lighting as required.
6. Contractor shall utilize HEPA-exhaust units on-site during all glove bag operations.
7. Contractor shall provide a crew of two or more persons for glove bag removal.

C. Preparation
1. Place necessary tools in the glove bag. Wrap the bag on the pipe, seal with staples and tape leaving enough sealed space above pipe for access. Secure the bag to support the weight of the stripped insulation and water.
2. Insert the HEPA vacuum nozzle and wetting agent sprayer flexible tubing into the bag and seal air tight.

D. Removal
1. Install a decontamination facility and utilize modified containment. Install a HEPA filtration unit.
2. During removal periodically wet the inside surfaces and waste for better visibility and fiber control. Use cold water to prevent fogging.

3. During removal, periodically use HEPA-vacuum to compensate for any leaks and to reduce airborne fiber levels.
4. Cut the insulation cleanly for neat sealing of exposed insulation. Leave a 2" margin at the edge of the bag for safety.
5. After removal and brushing, wash down all interior bag surfaces to below the level where the bag will be sealed and saturate the waste. Look for residue in folds and on the backside of the pipe, etc.
6. Gather tools in a gloved hand and pull the glove inside out. Seal the arm with tape and cut through the middle of the tape. Save the bagged tools for the next glove bag operation.
7. Collapse the bag with the HEPA vacuum. With the vacuum still applied, seal the bag just above the glove level. Remove the nozzle and tubing. Remove the glove bag from the component and immediately place in a waste bag. Check the component for loose waste and vacuum as required.

E. Following Removal
1. Seal exposed insulation with fiberglass wetable cloth while the insulation is damp, unless additional removal is planned.
2. If no additional removal is planned, the glove-enclosed tools shall be immersed in a pail of water, opened, and cleaned. The water and waste must be disposed of as asbestos waste.
3. At the direction of the Consultant all stripped pipe surfaces shall be encapsulated.

3.13 REMOVAL OF ASBESTOS-CONTAINING SPRAY-APPLIED FIREPROOFING OR ACOUSTICAL PLASTER

A. Work Area Preparation
1. Full containment will be required, which includes at least two layers of six-mil polyethylene sheeting on the walls and floor.
2. Negative pressure must be maintained in the work area

B. Removal of Materials Interfering with Access
1. Suspended ceiling panels, when present under the asbestos-containing material must be assumed to be contaminated. As such they must be cleaned by HEPA-vacuuming inside the work area and wet wiped as they are removed from through the waste removal port. Alternatively, they are to be disposed of as hazardous waste.

C. Removal of the Fireproofing or Acoustic Plaster
1. The materials to be removed must be thoroughly wetted with amended water prior to scraping.
2. The bulk material may be removed by use of hand scrapers. The surfaces must then be brushed and wet wiped until the Consultant confirms that they are sufficiently clean.

3.14 REMOVAL OF THERMAL SYSTEM INSULATION OTHER THAN BY GLOVE BAG

A. When thermal system insulation is present in quantities or locations, which make the use of glove bags infeasible, they may be removed in a manner similar to that described for fireproofing or acoustic plaster.

3.15 CONSULTANT'S APPROVAL OF REMOVAL WORK

A. Upon completion of the removal work, but prior to commencing encapsulation or post-abatement cleaning of the work area, the Contractor shall request the Consultant to conduct an inspection and approval of the removal work.

B. All asbestos materials shall be removed, gross debris cleaned up, and waste bags removed from the work area prior to this approval.

3.16 CLEANING AND FINAL DECONTAMINATION

A. This section applies to cleaning the work area where asbestos removal work has been performed. After all asbestos-containing or contaminated materials have been removed; the Contractor shall remove all wastes and perform a thorough multi-stage final cleanup and decontamination of the work area per the methods indicated below. Final cleaning shall be performed only after all waste is packaged and removed, but prior to re-installing equipment or dismantling any barriers, decontamination facility, or protective coverings. Cleaning shall be performed before replacing any type of insulation, and shall be subject to the Consultant's approval based on a visual inspection (including surface wipe testing if appropriate and air testing performed using NIOSH method 7400. HEPA exhaust systems shall operate continuously throughout the cleaning and air testing process until the Consultant authorizes their shutdown and removal from the work area. The Contractor shall notify the Consultant at least one hour in advance of the expected completion time of the site cleaning in order to allow the scheduling of air clearance testing.

B. Methods and Approvals: Cleaning methods and approvals shall consist of the following tasks performed in the listed order.

1. Remove all visible accumulations of asbestos debris on the protective coverings on floors, walls, and other surfaces, and then HEPA vacuum all surfaces to pick up excess water and gross saturated debris. A wet-dry shop vacuum dedicated to asbestos abatement may be used before HEPA vacuuming.
2. After HEPA vacuuming, the work area air shall be lightly misted with amended water and then all protective coverings on ceilings, walls, floors, and other items in the work area shall be wiped clean (first cleaning.)
3. After the Contractor has completed the above steps, he shall request that the Consultant inspect the site. To facilitate scheduling of this inspection, the Contractor must notify the Consultant of the anticipated completion time of the initial cleaning work at least two hours in advance.
4. If the Consultant observes any asbestos waste or fibers within the work area during the inspection, the Contractor shall perform additional cleanup and decontamination as directed by the Consultant.
5. If the Consultant approves this first cleaning, the Contractor shall slowly remove the upper layer of all protective poly coverings on floors, walls, ductwork, and other surfaces and package them in 6-mil waste bags. The waste bags shall then be removed from the work area using the procedures described in Section 1.22. The bottom layer of protective poly coverings, the decontamination facilities, the HEPA exhaust systems, all barrier walls and seals on HVAC components shall remain in place and in use.
6. Unless otherwise permitted, the contractor shall then perform a second cleaning of all surfaces in the work area by HEPA vacuuming and wet washing. Upon the approval of the Consultant, all remaining protective poly coverings shall be slowly removed and disposed of as described in Section 1.22. However, the barrier walls, decontamination facilities, HEPA exhaust systems, and seals on HVAC components shall remain in place and in use, as well as the final layer of polyethylene protecting the walls and windows.
7. Upon obtaining the Consultant's written approval of final cleaning, the contractor shall encapsulate all substrate surfaces and other surfaces within the work area as specified herein. Unless otherwise permitted, drying time shall be as specified by the manufacturer before final air sampling is conducted.

8. After successful completion of the final air clearance testing as prescribed in the following section, the contractor shall carefully remove in the listed order: the decontamination facilities; any temporary barrier walls or tunnels, seals on HVAC components. The HEPA exhaust systems shall be removed only after all other items are removed. A HEPA vacuum shall be kept on site during this final disassembly work to clean up any dust or debris.
9. If any of the post cleaning PCM air sample results are above 0.01f/cc, or TEM's above 70 structures per square millimeter on average, or a pre-existing level of normal background fibers if shown to be higher than 0.01 f/cc by the Consultant, the Consultant may require additional cleaning and decontamination and the above inspection and air tests shall be repeated by the Consultant.
10. Workers shall wear approved respiratory and personal protective equipment throughout all cleanup and waste disposal activities.

3.17 MONITORING, TESTING, AND INSPECTION

A. The Owner's Consultant shall monitor the performance and execution of the work. The monitoring work shall be performed both inside the work area and the surroundings to ensure full compliance with these specifications and all applicable regulations. Ambient air samples will be collected and analyzed by the Consultant. The Contractor shall provide full support to the Consultant throughout the work. Monitoring and inspections shall include air samples in the work space, periodic personnel samples at breathing levels on a number of workers, air samples in the areas surrounding the work areas and the outside, checking of the Contractor's standard operating procedures, engineering controls, respiratory protection equipment, packing, packaging, transporting and disposal of asbestos, decontamination facilities and procedures, and any other aspects of the abatement process that may impact the health and safety of the people and the pollution of the environment.

B. The Owner or Consultant shall bear all costs in connection with the sample collection and laboratory work referenced in Paragraph A above. However, the costs of all subsequent sample collection by the Consultant and laboratory work required because the limits specified were exceeded in the initial tests, shall be borne by the Contractor. The Contractor shall also conduct and bear the cost of personal air samples for OSHA compliance.

C. The Contractor shall receive copies of all laboratory reports representing the results of the Consultant's air monitoring and inspection program. All information shall be recorded in the Contractor's air monitoring log.

3.18 AIR MONITORING BY CONTRACTOR

A. The Contractor shall be responsible for personal air monitoring to document compliance with OSHA regulations using the methods listed below.

B. The analysis laboratory performing this work shall be an independent party not financially or managerially connected to the Contractor.

C. The laboratory shall be participating successfully in the AIHA/NIOSH Proficiency Analytical Testing (PAT) program.

D. Air sampling materials and equipment requirements are as follows:
   1. Sampling for analysis by Phase Contrast Microscopy shall employ cellulose ester collection filters with 0.8-micron pore size or less. Cassettes shall be loaded with filters under clean laboratory conditions. A 0.5-micron pore size cellulose ester-backing filter shall be placed behind the collecting filter, followed by the cellulose support pad and the cassette base.

2. The filter assembly shall be upstream of all other components in the sampling train. An airflow-measuring device, when used, shall be downstream of the filter and upstream of the pump assembly or integrated with the pump.
3. Sampling pumps shall supply constant flow.
4. An airflow measuring/metering device shall be used, and shall be calibrated before and after each use.

E. Numbers and frequencies of personal air sampling shall be as required by OSHA regulations but not less then two samples per eight hour work shift during times of asbestos removal work.

F. Results of sample analysis shall be reported to the Consultant within twenty-four hours of collection.

G. All other air sampling for compliance with the Specifications shall be performed by the Owner's Consultant at no cost to the Contractor except where the Contractor **fails** specified tests. Final air samples shall be collected and analyzed using Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM). If the area fails the first clearance air test, the Contractor must re-clean the work area. Subsequent PCM or TEM testing will be at the expense of the Contractor.

H. The Contractor shall use a pre-approved chain-of-custody form for all personal air samples he collects.

I. All PCM samples shall be analyzed pursuant to NIOSH Method 7400.

J. The Contractor shall at no additional charge provide and install AC power and extension cords for the Consultant to collect all area and final air clearance samples as required herein.

3.19 FINAL INSPECTION AND TESTING

A. After thorough cleaning of the workplace, and if a high degree of cleanliness has been achieved, the Contractor shall notify the Consultant that the workplace is ready for inspection and final testing. The Owner's Consultant and the Contractor shall then visually inspect the workplace for the detection of any visible asbestos dust or contamination. If the visual inspection does not reveal any dust or other signs of contamination, final air testing shall commence.

B. The final testing shall take place under active agitation of the air in the workplace with the HEPA filtered exhaust units operating. The Contractor shall also supply and operate additional circulating fans and leaf blowers as directed by the Consultant during this final testing to ensure effective air circulation.

The final test shall consist of taking air samples in the workplace to establish that airborne fiber levels do not exceed 0.01 f/cc by PCM. If the Hygienist determines that, based on background tests, the normal levels of fibers in the workplace are greater than 0.01 f/cc, that normal level of fibers shall become the clearance criterion. Surface wipe samples may also be taken and analyzed at the option of the Owner to confirm the results of the air sampling. At the option of the Owner, TEM analysis may also be employed for final air samples. If the results of the final testing are not satisfactory, thorough wet cleaning and/or HEPA vacuuming shall be repeated until the required decontamination results are achieved.

Contractor should assume that final air testing and analysis should require the following minimum times to perform: PCM 6-12 hours, TEM 24-72 hours.

C. After achieving the level of cleanliness and decontamination as specified herein and a confirmed by the final testing and checking, the Consultant shall thoroughly inspect the space jointly with the Contractor to determine whether any damage has been done to the finishes, equipment, or any other part of the work space. A final inspection report shall be prepared jointly by the Consultant and the Contractor for review with the Owner detailing the items to be fixed by the Contractor.

END OF SECTION

SECTION 02097

PCB LIGHT BALLAST REMOVAL

1.01 INTRODUCTION

This section describes the procedures and requirements to be followed by the Contractor in order to remove, load, label, manifest, and dispose of fluorescent light ballasts which contain small PCB capacitors. In addition to the requirements outlined here, Contractor shall comply with the U.S. Environmental Protection Agency's PCB Rules 40 CFR Part 761 and relevant state rules and regulations.

1.02 CONTRACTOR QUALIFICATIONS

Contractor (or combination of subcontractors) shall meet the following minimum qualifications:

A. Contractor shall have all state, federal, and local permits for handling and transporting PCB materials.

B. Contractor shall be an EPA approved Commercial Storer for over 500 gallons of PCB Waste pursuant to 40 CFR 761.65 (d).

C. Contractor's process of ballast recycling shall be approved as an Alternative Disposal Method pursuant to 40 CFR 761.60 (e).

D. Contractor's workers who are handling PCB materials shall be 24 hour OSHA trained pursuant to OSHA 1910 or HAZWOPER trained. All supervisors shall be 40 hour OSHA trained. A training certificate shall be available for inspection by owner.

E. Contractor and/or Contractor's Transporter shall have and implement a Spill Prevention Control and Countermeasure (SPCC) Plan pursuant to 40 CFR 761.65(c)(7)(ii).

F. Contractor shall have a fully funded Closure Plan pursuant to 40 CFR 761.65(e), (f), and (g). Evidence of funding shall be provided prior to the start of the job.

G. Contractor shall have and implement a written Hazard Communication Program pursuant to 29 CFR 1910.1200.

1.03 SCOPE OF WORK

Contractor shall be responsible for the following work:

A. Ballast Removal and Packaging
   1. Contractor responsible for opening all light fixtures in order to investigate and determine whether PCB containing ballasts are present.
   2. The abatement contractor will be required to remove all PCB ballasts from the fixtures.
   3. Contractor shall pack all ballasts in drums with care, so as not to cause ballasts to leak as a direct result of removal and packing.
   4. Contractor shall segregate all leaking ballasts from non-leaking ballasts, separately package leaking ballasts in plastic bags, and place these bags in a drum along with non-leaking ballasts.
   5. Contractor shall label all drums properly. Contractor shall supply labels. Labels shall contain the following information:
      a. Contents of drum
      b. DOT description

c. Name, address, and telephone number of the Owner (i.e., the Generator)
d. Emergency telephone numbers
e. Date on which drum was filled with ballasts
f. Class 9 label

6. Contractor shall ensure that no other material or waste is contained in the drums except for ballasts from fluorescent light fixtures.
7. Contractor shall supply the drums, and only UN-approved UN/1A2/Y1.2/100 rums shall be used. Leaking drums shall not be accepted.
8. Contractor shall not load drum with more than 750 pounds of gross weight.
9. Contractor shall not use any absorbent material to pack ballasts in drums.
10. Contractor shall not use any plastic liners in drums.
11. Contractor shall not use any "Overpack" drums or equivalent.
12. Contractor shall move all drums filled with ballasts to a loading dock immediately accessible to a 10 ft. x 50 ft. truck capable of transporting 40,000 pounds of payload weight. Alternatively, Contractor, at its option, may use a smaller truck. If there is no loading dock available, a truck with a lift gate shall be used for the pickup.

B. Ballast Shipment Loading and Transportation

1. Contractor shall supply a Uniform Hazardous Waste Manifest (EPA Form 8700-22) or alternate which contains substantially similar information to be signed by the Owner, Contractor's transporter, and ballast recycling facility or final disposal facility.
2. Owner shall provide a person who will open the door to the loading dock and show Contractor's truck driver where the drums are located.
3. Contractor shall provide an estimate of the weight of the filled drums.
4. Contractor shall inspect labels; if not properly labeled, Contractor shall correct the existing label.
5. Contractor shall load the drums onto the truck. Owner shall provide one person to assist Contractor during truck loading.
6. The shipment shall be transported in accordance with all DOT, EPA, state, and local regulations to the designated disposal facility.

C. Ballast Shipment Unloading

1. Contractor shall provide personnel to unload the drums.
2. Contractor shall weigh each drum; Owner is invited to witness each weighing.
3. Contractor shall assign each drum a unique drum number.
4. Contractor shall sign each Manifest and shall mail one copy of the completed Manifest to one designated person representing the Owner within ten business days of the receipt of the shipment.
5. Contractor shall store all drums in accordance with 40 CFR 761.65.

D. Ballast Disposal

1. Contractor shall dispose of the PCB ballasts in accordance with one of the following methods:
   a. By incineration pursuant to 40 CFR 761.70
   b. By dismantling as per Full Circle or equivalent, i.e., removing the PCB contaminated materials and destroying them pursuant to 40 CFR 761.70. The remaining metals from the ballast shall be tested in accordance with an EPA approved sampling protocol. Uncontaminated (less than 100 ug/100 cm^2 PCBs) metals shall be reclaimed in smelters or foundries. All contaminated metals shall be further cleaned and tested or disposed of by incineration.
2. Contractor shall submit a written plan of disposal to Owner prior to disposal, which shall be approved in writing by Owner before disposal.

3. Contractor shall provide a Certificate of Recycling and Disposal to the Owner after incineration of PCB materials, and recycling of uncontaminated metal components.

E. Spills.

1. In the event of a PCB spill, Contractor shall immediately notify the Owner and the National Response Center (1-800-424-8302) and clean up the spill pursuant to 40 CFR 761 Subpart G.

END OF SECTION

SECTION 02098

FLUORESCENT LIGHT TUBES REMOVAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section describes the procedures and requirements to be followed by the Contractor in order to remove, load, label, manifest and dispose of fluorescent lamps, which contain vaporized mercury. In addition to the requirements outlined here, Contractor shall comply with all Federal, State and Local rules and regulations.

1.02 DEFINITIONS

A. The following terms are hereby defined for the entirety of this specification:
1. Disposal Contractor is the company who is proposing to dispose of or recycle lighting waste.
2. Generator is the person or entity that owns or manages a building from which lighting waste is being removed.
3. Lamp Processor is the entity that operates the lamp processing and recycling apparatus.
4. Abatement Contractor is the person or entity that is removing lighting waste for the Generator.
5. Transporter is the entity that will actually move the lamps from the project site to the Lamp Processor's facility.

1.03 CONTRACTOR QUALIFICATIONS

A. Disposal Contractor and Lamp Processor shall meet the following minimum qualifications:
1. Abatement Contractor and Lamp Processor shall possess all federal, state, and local permits and authorizations for handling mercury-containing lamps.
2. Disposal Contractor and Lamp Processor's process of lamp recycling shall meet all applicable federal, state, and local requirements.
3. Lamp Processor shall possess all necessary permits and authorizations.
4. Disposal Contractor and Lamp Processor's workers who are handling mercury-containing lamps shall be 24 hour OSHA trained (29 CRF 1910.120). All supervisors shall be 40 hour OSHA
5. Abatement/Disposal Contractor shall make all training certificates available to Owner.
6. Disposal Contractor and Lamp Processor shall possess written Health and Safety Programs, Hazard Communication Programs, and Emergency Response Plans.
7. Disposal Contractor and Lamp Processor shall have pollution liability insurance in an amount and with a carrier acceptable to the Owner.
8. Disposal Contractor shall make available to Abatement Contractor full instructions on handling and packaging mercury containing lamps.

1.04 SCOPE OF WORK

A. Lamp Removal and Packaging:
1. Abatement Contractor shall preserve all boxes in which new lamps were shipped. These boxes will be used for packing old lamps.
2. Abatement Contractor shall remove all lamps from fixtures with care so as to eliminate breakage.

3. Abatement Contractor will pack lamps in the boxes of material being shipped. Lamps will be packed tightly to eliminate breakage during shipping. The Disposal Contractor will supply "Shortage" boxes.
4. Abatement Contractor will follow packing instructions supplied by Disposal Contractor.
5. Abatement Contractor will tape shut all packed containers of lamps and prepares these containers for shipping. Packed boxes of lamps will be palletized and shrink-wrapped.
6. Abatement Contractor will label all packed containers of lamps with labels provided by the Disposal Contractor.
7. Abatement Contractor and/or Generator will assist Transporter in loading all packed lamps onto Transporter's truck.

B. Waste Lamp Transportation and Unloading:
1. Disposal Contractor will arrange for transportation of all packed lamps.
2. Disposal Contractor / Lamp Processor will unload packed lamps from the truck
3. Disposal Contractor / Lamp Processor shall inventory lamps upon unloading.
4. Disposal Contractor shall sign each manifest used and shall mail a copy to the Generator within 5 days of receipt of shipment.

C. Lamp Recycling:
1. Lamp Processor shall disassemble the lamp while maintaining strict adherence to all federal, state and local regulations.
2. Lamp Processor shall separate lamp components into groups of recyclable materials (e.g. glass, mercury containing material, lead, aluminum, etc.)
3. The aluminum end caps, crushed glass, and phosphor powder must be routinely tested to ensure that the end product as it leaves the recycling facility if under the 0.2 mg/l TCLP limit for mercury.
4. Lamp Processor shall reclaim or cause to be reclaimed, mercury from all mercury-contaminated material. A minimum of 99% of this mercury content must be recovered.
5. Lamp Processor shall purify the mercury with a purity of 99% and make available for reuse all reclaimed mercury.
6. Lamp Processor will provide certification that all lamp components have been properly recovered, shipped for reuse or disposed of in accordance with all applicable laws, regulations, permits, and licenses. This Certification shall be provided in writing.

D. Spills
1. In the event of a mercury spill, Lamp Processor shall immediately notify the Generator and the National Response Center, and clean up the spill in accordance with all federal, state, and local regulations.

SECTION 02099

MISCELLANEOUS HAZARDOUS MATERIALS ABATEMENT

PART 1 GENERAL

1.01 INTRODUCTION:

A. This section describes the procedures and requirements to be followed by the Contractor in order to remove, load, label, manifest, and dispose of mercury containing light switches, refrigerant in packaged HVAC units, and batteries. In addition to the requirements outlined here, Contractor shall comply with the U.S. Environmental Protection Agency's rules and relevant state rules and regulations.

1. Contractors are urged to utilize the mandatory job walk to verify the extent of removals.

1.02 CONTRACTOR QUALIFICATIONS

A. Contractor (or combination of subcontractors) shall meet the following minimum qualifications:

1. Contractor's workers who are handling hazardous materials shall be 24 hour OSHA trained pursuant to OSHA 1910 or HAZWOPER trained. All supervisors shall be 40 hour OSHA trained. A training certificate shall be available for inspection by owner.
2. Respiratory Protection: If ventilation does not maintain inhalation exposures below the PEL (TLV), Use NIOSH approved respirators as per current 29CFR1910.134, Instructions/warning and NIOSH-respirator decision logic-publication number 87.108.
3. Employees will be provided with and required to use impervious clothing, gloves, face shields (eight-inch minimum), and other appropriate protective clothing necessary to prevent repeated or prolonged skin contact with liquid mercury. If employee's clothing may have become contaminated with mercury, employees should change into uncontaminated clothing before leaving the work premises. Clothing contaminated with mercury should be placed in closed containers for storage until it can be discarded or until provision is made for the removal of mercury from the clothing. If the clothing is to be laundered or otherwise cleaned to remove the mercury, the person performing the operation should be informed of mercury's hazardous properties. Non-impervious clothing which becomes contaminated with mercury should be removed promptly and not reworn until the mercury is removed from the clothing.
4. Contractor shall have and implement a written Hazard Communication Program pursuant to 29 CFR 1910.1200.
5. Contractor shall have at least $1 million of pollution liability insurance with an "A" or "A-" or better rating by the A.M. Best Co.

1.03 SHIPMENT METHODS AND REGULATIONS:

A. No person may /transport,/ offer or accept a hazardous material for transportation in commerce unless that person is registered in conformance and the hazardous material is properly classed, described, packaged, marked, labeled, and in condition for shipment as required or authorized by /the hazardous materials regulations (49 CFR 171-177)./ [49 CFR 171.2 (7/1/96)

B. Contractor shall pack all switches in drums with care, so as not to cause switches to break as a direct result of removal and packing.

C. Contractor shall label all drums properly. Contractor shall supply labels. Labels shall contain the following information:
   1. Contents of drum
   2. DOT description
   3. Name, address, and telephone number of the Owner (i.e., the Generator)
   4. Emergency telephone numbers
   5. Date on which drum was filled with materials
   6. Class 9 label

D. Contractor shall ensure that no other material or waste is contained in the drums except for Mercury materials.

E. Contractor shall supply the drums, and only UN-approved UN/1A2/Y1.2/100 drums shall be used. Leaking drums shall not be accepted.

F. Contractor shall not load drum with more than 750 pounds of gross weight.

G. Contractor shall not use any absorbent material to pack switches in drums.

H. Contractor shall not use any plastic liners in drums.

I. Contractor shall not use any "Overpack" drums or equivalent.

1.04 HAZARDOUS SHIPMENT LOADING AND TRANSPORTATION

A. Contractor shall supply a Uniform Hazardous Waste Manifest (EPA Form 8700-22) or alternate which contains substantially similar information to be signed by the Owner, Contractor's transporter, and ballast recycling facility or final disposal facility.

B. The shipment shall be transported in accordance with all DOT, EPA, state, and local regulations to the designated disposal facility.

1.05 MERCURY DISPOSAL

A. When mercury, as a commercial chemical product or manufacturing chemical intermediate or as an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed as a hazardous waste according to Federal and/or State regulations. Also defined as a hazardous waste is any container or inner liner used to hold this waste or any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill into water or on dry land of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5(e)). [40 CFR 261.33

   A solid waste containing mercury may become characterized as a hazardous waste when subjected to the Toxicant Extraction Procedure listed in 40 CFR 261.24, and if so characterized, must be managed as a hazardous waste. 40 CFR 261.24

B. Contractor shall submit a written plan of disposal to Owner prior to disposal, which shall be approved in writing by Owner before disposal.

C. At a minimum the contractor will be required to provide HAZWOPER certified staff to remove "intact" devices. The devices will be stored in approved containers and shipped (with appropriate manifesting) to an approved recycling facility.

1.06 SPILLS

A. In the event of a Mercury spill, Contractor shall immediately notify the Owner and the National Response Center (1-800-424-8302) and clean up the spill pursuant to 40 CFR 761 Subpart G.