

NOTICE TO BIDDERS

- Scope of Work:** The Contractor shall furnish all labor, equipment, materials, and accessories necessary for removing specific asbestos containing materials at the John C. Tilton Elementary School, 70 Grove Street, Haverhill, Massachusetts in accordance with the requirements of the Commonwealth of Massachusetts and all Federal Regulations.
- Pre-bid Inspection:** A Pre-bid Inspection will originate at the Main Entrance of the Tilton School, 70 Grove Street, Haverhill, MA on Thursday, May 23, 2001.
- Bid Due Date:** Bids are for the Removal of Asbestos Containing Materials. This Bid price does not include the removal or replacement for any other asbestos containing materials removed from the Tilton School, Haverhill, MA. Bids will be received at Hub Testing Laboratory on Tuesday, May 29, 2001 no later than 2:00 p.m. Bid sheet may be faxed to 781-893-4414.
- Representation:** Haverhill Public Schools, Director of Business has designated Hub Testing Laboratory, Inc. of 95 Beaver Street, Waltham, MA 02453, as Owner Representative. As the Owner's Representative, Hub Testing Laboratory, Inc., Tel. (781) 893-8330, Fax. (781) 893-4414, has the power to ascertain the progress of the project and to act for the owner in all phases of contract performance.
- Wages:** Prevailing wage rates are located within this section of the bid document. Under regulation, which is effective as of May 7, 1993, every contractor and subcontractor on Approved School Projects must submit weekly payroll records as a condition of receiving payment for their work. 603 CMR 38.03(2) k states "Every contractor and subcontractor working under the terms of any contract for construction on an approved school project shall file weekly payroll records with the awarding authority in the form described in M.G.L. c.149, s. 27B. The awarding authority shall withhold payment for any construction work performed on an approved school project for so long as the payroll records for the work performed are not filed with the awarding authority.
- Note:** This project is being performed in conjunction with and as a necessary part of asbestos management of the Tilton School. It is necessary for the Asbestos Removal Contractor to be able to work with and coordinate with other trades.

PRICE PROPOSAL

ASBESTOS REMOVAL

JOHN C. TILTON SCHOOL

PROJECT NO. H-529-H

Remove asbestos containing materials at the John C. Tilton School as described in the Asbestos Abatement Specification.

PROPOSAL OF _____

(Hereinafter called "Bidder")

CONTRACTOR'S NAME: _____

ADDRESS: _____

SIGNATURE OF BIDDER: _____

TITLE OF BIDDER _____

DATED: _____

To the Awarding Authority, City of Haverhill Public School, Haverhill, Massachusetts (herein after call the "Owner"):

The Undersigned, as Bidder, proposes to furnish all labor and materials required for REMOVAL OF ASBESTOS CONTAINING MATERIALS. The Bidder, having examined the specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials, and labor, hereby proposes to furnish all labor, materials and supplies and to construct the project in accordance with the contract documents, within the time set forth therein and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the contract documents which this proposal is a part.

THE LUMP SUM TOTAL PRICE IS:

And _____ Cents.

SECTION 02082

ASBESTOS ABATEMENT

Bids for work under this section shall be for the complete work and shall be filed in an electronically faxed document sent to Hub Testing Laboratory, Inc. (Fax. No. 781-893-8330) not later than 2:00 p.m., Tuesday, May 29, 2001, in accordance with the requirements of the Awarding Authority.

PART 1 - GENERAL

GENERAL CONDITIONS

The sections of these specifications attached shall apply and are hereby made a part of this section of the Specifications.

A sketch is provided to show approximate locations of the asbestos containing materials to be removed. However, it is the responsibility of the Contractor to determine and verify exact quantities for the purpose of bid and costing. For this reason Contractors are urged to attend the "walk through" prior to preparing their proposals and determining prices.

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PART 1 - PROJECT

1.01 SUMMARY OF WORK

- A. The Contractor shall provide service, labor, materials, equipment, insurance and supervision for the proper removal of asbestos containing materials and decontamination in the John C. Tilton School building.
1. All work shall be performed in accordance with all OSHA, EPA, DEP, NESHAP, NIOSH, DLWD and any local regulations governing the removal of asbestos containing materials.
 2. Final aggressive clearance sampling will be performed using the AHERA NIOSH 7402 Method (transmission electron microscopy protocol (Z Test)) and the NIOSH 7400 Method when applicable.
 3. The Contractor is responsible for protection of any non-ACM materials and coverings within a work area from contamination unless designated otherwise for removal and disposal.
 4. It is the contractors responsibility to fully clean all surfaces in each and every work area and then apply an encapsulant as a "lock down" agent to all abated surfaces.
- B. This Contract is being performed as a major demolition. All work shall be performed in close coordination with the construction schedule and with the Town Representative and the School Department.

Schedule for Asbestos Removal:

1. Asbestos Removal of thermal system insulation including pipefittings in the areas indicated on the attached sketch.
2. Remove all debris and decontaminate storage spaces, closets and associated spaces in the designated area of the school.

It is to be noted that the start of this work is to occur at the beginning of the school summer vacation and the abatement work shall be continuous until all work is satisfactory completed and the work area is clean and acceptable to the School Department.

- C. All Asbestos Abatement work must be notified to Regulatory Agencies and scheduled well in advance of the start up date. Delays by the Asbestos Abatement Contractor will have significant impact on the school schedule.

1.02 SUMMARY OF TASKS

- A. This section covers the furnishing of all labor, materials, facilities, equipment services, employee training and testing, permits and agreements necessary to perform the work required for asbestos removal in accordance with these specifications, EPA, OSHA, 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.
- B. Description of Work:
Perform the work and provide the services as follows:
1. Pre-abatement inspection.
 2. Work area preparation.
 3. Trained workers with respiratory protection and medical examination.
 4. Packing material, packaging, labeling, transporting and disposal of contaminated material, including waste shipment record.
 5. Decontamination of work area for final inspection and testing.
 6. Provide access, support and protection to all authorized visitors and inspectors.

1.03 DEFINITIONS

- A. Terminology: Any terms not defined herein shall have the meaning given in the applicable publications and regulations.
- B. Authorized visitors: An Owner Representative or a representative of any regulatory or other agency having jurisdiction over the project.
- C. ACM - Asbestos Containing Materials
- D. TSI - Thermal Systems Insulation
- E. Pipe Fittings - consist of elbows, tees, valves, etc. which are insulated with a custom mixed hard packed dry mud.
- F. SF - Square Feet
- G. LF - Linear Feet

1.04 AUTHORITY TO STOP WORK

- A. The Owner and/or Owner Retained Industrial Hygienist (I.H.) has the authority to stop the abatement work whenever the work conditions are considered a Safety Hazard or at any time the I.H. determines either personally or through the Owner's Representative that conditions are not within the specifications and applicable

regulations. The stoppage of work shall continue until conditions have been corrected and steps have been taken to the satisfaction of the Owner. Standby time required to resolve violations shall be at the Asbestos Contractor's expense.

1.05 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in text by basic designation only.
1. Environmental Protection Agency

Regulations for Asbestos (Code of Federal Regulations Title 40, Part 61)

Guidance for Controlling Friable Asbestos Containing Materials in Buildings. (Report Number 560/5-85-024)

Asbestos Containing Materials in Schools, Final Rule, 40 CFR Part 763 (Asbestos Hazard Emergency Response Act, AHERA).
 2. Occupational Safety and Health Administration (OSHA) Asbestos Regulations (Code of Federal Regulations Title 29 Part 1910, Section 1910.1001, 1910.145, 1910.134, 1910.25, 1910.26, 1910.28, 1910.30, and the asbestos standard for the construction industry 1926.1101.
 3. National Institute of Occupational Safety and Health (NIOSH):
"Respiratory Protection ... A Guide for the Employee," Publication No. 78-193B.
 4. American National Standards Institute (ANSI) Z86.1-1973Commodity Specification for Air.
 5. Massachusetts Department of Environmental Protection (DEP):
310 CMR 6.00, "Ambient Air Quality Standards for the Commonwealth of Massachusetts", 310 CMR 7.15 and CMR 7.15, "Air Pollution Control Regulations: U Asbestos."
 6. Commonwealth of Massachusetts, Chapter 614, No.1419.
 7. Massachusetts Department of Labor and Workforce Development, Chapter 453, CMR 6.00, "Removal, Containment or Encapsulation of Asbestos," June 26, 1998".

1.06 NOTIFICATIONS, PERMITS, WARNING SIGNS, LABELS AND POSTERS

- A. Secure all the permits required for the work, including disposal of asbestos in an approved landfill, prior to the start of work.

B. Notification:

1. Provide written notification to the EPA at least 10 days in advance of the work start date.
2. Provide Massachusetts DEP and Department of Labor & Workforce Development written notification at least 10 days in advance to the start of work.

C. Warning Signs: Post the required signage around the workplace and at every point of potential entry from outside, showing the standard wording from OSHA 1926.58. Warning signs shall be bright color so they will be easily noticeable. The size of the sign and the size of the lettering shall be no less than the OSHA 1926.58 and 1910.145 requirements.

D. Labels: Provide the required OSHA, EPA and DOT labels for all plastic bags and all drums utilized to transport contaminated material to the landfill.

E. At the job site provide any other signs, labels, warnings and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure. Signs shall be in the appropriate languages in response to the ethnic background of the local population. Post in a prominent and convenient place for the worker a copy of the latest applicable regulations from OSHA and EPA, and State regulations including OSHA 29 CFR 1926.1101, 1910.1001 and 40 CFR 1, Subpart M.

1.07 CONTRACTOR QUALIFICATIONS

- A. Certification: The Contractor presently and regularly performs asbestos abatement as a principal service.
- B. Experience: Name and location of at least three asbestos abatement projects within the past 12 months with the name and telephone number of purchaser of abatement services and the final decontamination levels achieved.

1.08 PERSONNEL QUALIFICATIONS

A. Superintendents, Foreman and Workers

1. Training and knowledge of applicable regulations and expertise in safety and environmental protection as evidenced by a certificate of participation and successful completion of training courses offered by the EPA or an EPA approved educational institution proficient with this technology.

- a. Furnish certificates for each training course for each person, including required annual refresher training.
2. Experience with abatement work as evidenced by employment record showing participation in at least three (3) asbestos abatement projects. Identify specific projects proposed personnel have completed.
3. Provide evidence of required licensing through Massachusetts regulatory agencies.
4. Written medical approval to work while wearing a respirator in accordance with OSHA 1910.134; also proof of participation in medical surveillance per 29 CFR 1926.1101.

1.09 STANDARD OPERATING PROCEDURES

- A. Develop and implement a standard operating procedure during abatement work to ensure maximum protection and safeguard from asbestos exposure of the workers, occupants, employees and the environment. The standard operating procedure shall be submitted in writing to the Owner for advance approval in compliance with Section 1.11.
 1. Tight security on a twenty four-hour basis from unauthorized entry into the work space, i.e. locked during non-working hours.
 2. Proper protective clothing and respiratory protection prior to entering the work space from the outside.
 3. Safe work practices in the work place, including provision for intra-room communications, exclusion of eating, drinking, smoking or in any way breaking the respiratory protection. Ground fault circuit interrupters shall be utilized for all electrical equipment.
 4. Proper exit practices from the work space to the outside through the showering and decontamination facility.
 5. Removing asbestos in ways that minimize release of fibers, including wetting with water containing a wetting agent (50% polyoxethylene ether and 50% polyoxethylene ester),³ transporting and disposing of contaminated material in a way that minimizes exposure and contamination and complies with the EPA.
 7. Emergency evacuation for medical or safety (fire and smoke) so that exposure will be minimized.

8. Safety from accident in the work space, especially from electrical shock, slippery surfaces and entanglement in loose hose and equipment.
9. Provisions for effective supervision, air monitoring and personnel monitoring for exposure during the work. Results of personnel monitoring shall be available within 48 hours of sampling.
10. Engineering systems that minimize exposure to fibers in the work space.
11. All equipment, tools, vehicles and supplies brought to the job site must be decontaminated and free of asbestos dust/residue prior to entry onto the property.

1.10 SUBMITTALS

- A. In accordance with Section 02082 the awarded Contractor shall furnish the following:
 1. Project design: "Abatement Plan", including drawings of the decontamination facility and their locations, work area isolation plan with layout of engineering controls (e.g., HEPA ventilation vents, etc.) and load out facility.
 - A. Specific approach in scheduling the removal of asbestos-containing materials from each abatement area in the building.
 2. Security System, warning signs and labels for bags and drums.
 3. Copy of notification to police and fire department, and copy of certificates from both the departments on their approval of the proposed security and safety plans.
 4. All notifications to Federal, State and local governments.
 5. Wetting agents and low pressure wetting system.
 6. Material Safety Data Sheets (MSDS) for all encapsulants, mastic solvents, spray adhesives, spray poly which are to be used on the project.
 7. Wall, floor and opening coverings and sealing tapes.
 8. Standard Operating Procedure showing how workmen, visitors and

employees will be protected from exposure and how spaces outside the work areas will be protected from contamination until completion of the work; also SOP for respiratory protection program.

9. Routing plan for movement of equipment into and removal of waste from the building.
10. Fire and emergency evacuation plans.
11. Detailed plans for decontamination facilities, and system allowing intra room communications between the work area and the outside.
12. Engineering system for exposure controls showing the number, location and capacity of supply and exhaust system, the expected direction of flow and the maximum and minimum negative pressure in each room.
13. Proof of existence of record that the contractor is complying with the OSHA's medical surveillance requirements.
14. Name of proposed landfill for disposal of waste materials and approved waste hauling firm.

1.11 PRE-CONSTRUCTION MEETING

- A. At this meeting, the Asbestos Abatement Contractor shall be prepared to discuss in detail the Submittals as defined in 1.11, specifically the "Abatement Plan".

1.12 AVAILABILITY OF TRAINED PERSONNEL:

- A. Manpower: There shall be a sufficient number of trained and qualified workers, foreman and superintendents to accomplish the work within the required schedule. It is imperative that a sufficient number of trained personnel be engaged throughout the abatement process.
- B. Pre-cleaning: General work cannot start without prior successful decontamination of each work area.
- C. Untrained or unqualified personnel: Shall not be employed to speed up completion of the abatement work. A qualified foreman/superintendent must be at the job site at all times when work is in progress.

1.13 SUBMITTALS DURING THE WORK

- A. Submit copies of the following items to the Owner Retained IH/IH Firm
1. Security and safety logs showing names of persons entering the work space, date and time of entry and exit, records of any accidents, emergency evacuation and any other safety and/or health accidents. This information shall be available on a daily basis and copies shall be submitted to the IH Firm at the end of each work week.
 2. Disposal certificates.
 3. Required permits, clearances, licenses, etc. shall be on site throughout the project.

1.14 EMERGENCY PRECAUTIONS

- A. Fire: The contractor shall establish emergency and fire exits from the workspace. All emergency exits shall be equipped with two (2) full sets of protective clothing and respirators at all times. A fire extinguisher shall be present at all times at the entrance of each and every decontamination facility.
- B. Medical: Local medical emergency personnel shall be notified prior to commencement of abatement operations as to the possibility of having to handle contaminated or injured workers, and shall be advised on safe decontamination.
- C. First Aid: The contractor shall be prepared to administer first aid to injured personnel during decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for 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 area.
- D. Local Agencies: Before the contractor starts actual removal of the asbestos material, the local police and fire departments shall be notified in writing as to the danger of entering the work area. The contractor shall make every effort to provide assistance to these departments should their personnel need to enter the contaminated area.

1.15 RESPIRATORY SYSTEMS

- A. Availability: Provide all workers, foreman, superintendents, authorized visitors and inspectors personally issued and marked respiratory equipment approved by NIOSH and MSHA.
1. When respirators with disposable filters are employed, provide sufficient filters and parts for replacement as necessary by the worker.

- B. Minimum protection: At a minimum, until exposure levels are established on a regular basis during air monitoring, use of half-mask air purifying respirators is required for all preparation work, and the use of powered air purifying respirators is required for all asbestos removal work.
- C. Testing: Half and/or full face respirators can only be used by personnel who have passed a quantitative or qualitative fit test. Copies of these test results are to be provided by the Contractor to the Owner-retained IH for the Owner's records.

Asbestos Concentration

Minimum Acceptable Respirator

Not in excess of 2.0 f/cc

Full face powered air purifying respirator equipped with HEPA filter.

Any supplied air respirator operated in

Greater than or equal to 2 f/cc but not in excess of 10 f/cc

Full face piece Type C supplied air respirator operated in the pressure demand mode with a HEPA filter and disconnect protection.

Greater than or equal to 10 f/cc

Full face piece Type C supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive

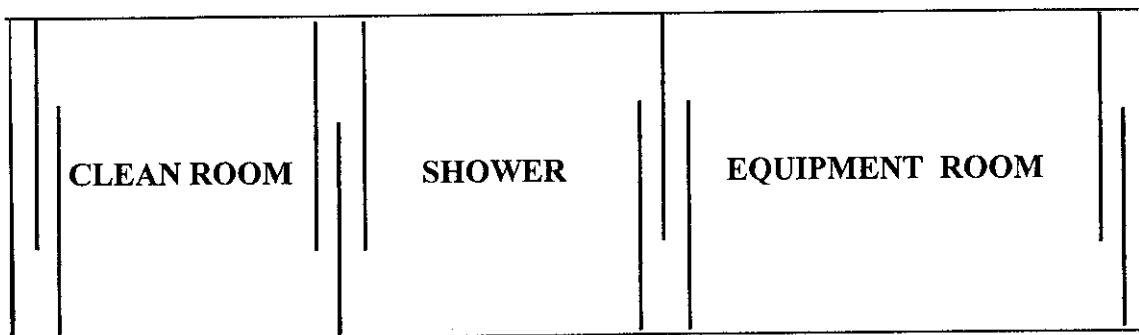
- * Disposable (single use) respirators are not to be worn for protection against asbestos unless specifically designed for this use.
- ** Greater respiratory protection is always acceptable regardless of asbestos concentration.
- *** Full or half face air purifying respirators may be used during preparation, final clean up, performance of repairs or asbestos associated work as per 453 CMR 6.14.

1.16 PERSONAL PROTECTIVE EQUIPMENT (PPE)

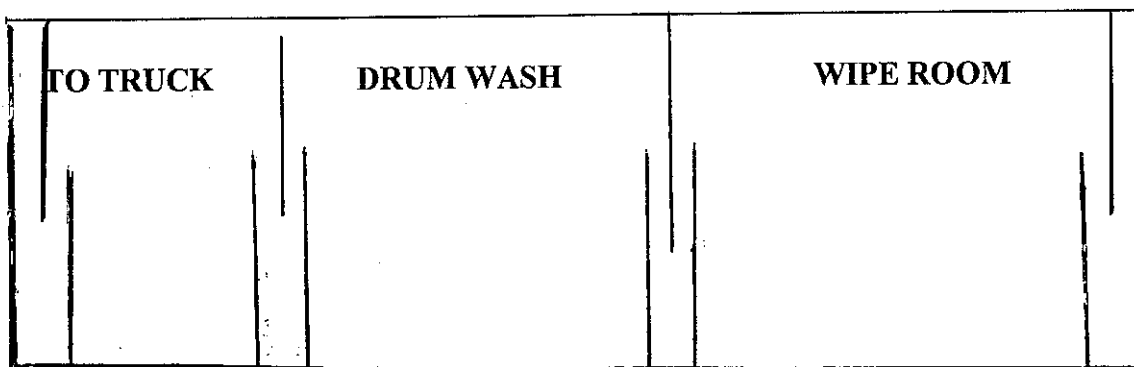
- A. Provide to all workers, foreman, superintendents and authorized visitors and inspectors disposable clothing consisting of full bodied coveralls, head covers, gloves and 18 inch high boot type covers or reusable footwear.
- B. Provide eye protection and hard hats as required by job conditions and safety regulations.
- 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.
- D. All disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the shower.

1.17 ENCLOSURES AND SHOWERS

- A. For each abatement area provide decontamination facilities located in an area agreed upon with the Owner's Representative and Retained I.H. The decontamination facility shall include a decontamination facility for workers and visitors and an waste load out decontamination facility for loading of asbestos into trucks for transportation to the landfill and the decontamination of equipment.
- B. The facility for workers and visitors shall consist of three rooms that serve as three air locks as follows: Clean room at entrance followed by Shower room followed by Equipment room leading into the work area.



- C. The waste load out for the cleaning of asbestos waste containers prior to loading onto trucks shall consist of an air lock from the work area leading into the Drum Wash and Wipe Room, and another air lock leading into the loading platform and the truck.



- D. Bagged material shall be packed and sealed in plastic lined drums or double bagged. Double bagging shall occur in the central compartment of a bag transfer air lock. Drum and bag exteriors shall be wet cleaned prior to removal from the wash section. Water is to be added to each bag of waste prior to sealing to keep contents damp. Bags shall be 6 mil polyethylene.
- E. The transfer of bags shall be performed using a minimum of three workers. A worker in compartment A, the work area, will remove gross contamination from bag by vacuuming and wiping then passing the sealed bag into a worker in compartment B. The worker in compartment B places bag into a drum or a clean bag; the second bag/drum is sealed and wet wiped and passed to a worker in compartment C who loads it into the truck. (Worker in compartment C enters area from the outside; compartment C is considered a clean area.)
- F. An air lock is a system permitting ingress and egress without permitting the air movement. It consists of two curtained doorways at least eight feet apart. Each curtained doorway shall be constructed by placing three overlapping sheets of 6 mil polyethylene sheeting over a framed doorway, securing each along the top of the doorway. The first and third sheet shall be secured on one side of the doorway and the middle sheet shall be secured on the other side of the doorway.
- G. Airlock Size - Where size of work area permits, eight-foot distance between doorways is acceptable. Where size of work area is prohibitive, distance between doorways may be adjusted but must allow enough space for one doorway to be closed before the next doorway is opened.
- H. Provide lockers for storage of street clothes of workers in the personnel clean room. Provide in the same room uncontaminated protective clothing and equipment. This room shall be used by workers and visitors to change from street clothes to disposable protective clothing and gear prior to entering into the contaminated area and to dress into street clothing after they have showered and dried in the shower room as they exit from the contaminated area.
- I. Provide in shower room showering facilities with hot and cold water arranged so as to provide complete showering of workers and visitors as they exit from the contaminated area. The shower room facilities and size shall be adequate to allow decontamination and thorough washing of all workers and visitors.
1. Contaminated shower run off and waste water shall be contained and adequately filtered prior to disposal via the building drainage system or shower run off and waste water shall be disposed of as contaminated waste.
- J. Provide the Equipment Room with storage for contaminated clothing and equipment. In this room workers and visitors remove visible asbestos debris, dispose of their disposable protective clothing except the respirator as they prepare to enter the shower room.

- K. The Drum Wash and Wipe Room shall be equipped with the facilities to wash and wipe the outside of the drum or bag prior to loading into the trucks for transportation to a landfill. Make provisions to prevent and/or collect any contaminated run-off from the Drum Wash Room.
- L. The Clean Drum Storage Room "C" shall be maintained as a clean area and shall be wiped down daily at the end of the shift.
- M. Provide heating and ventilation in the entire Decontamination System so that air flow will be from the outside towards the workspace.

1.18 PERSONNEL PROTECTION AND DECONTAMINATION

- A. Provide all personnel throughout the abatement process with the specified protective equipment and clothing . Ensure that all personnel entering and leaving the workspace follow the following procedures:
 1. Entering from the outside: Change from street clothes into protective clothing and respiratory protection and wear clean protective gear. Go through shower room into 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 labeled plastic bags for asbestos waste. Do not take off the respirator but still wearing the respirator enter the shower and shower thoroughly. Remove respirator to wash and to decontaminate the respirator. After drying, enter the clean room, store the decontaminated respirator in the assigned space and dress into street clothing.
 3. On Site Posting: Written procedures in workplace and train all personnel on the procedures for evacuation and emergency situations as described in the contractor's SOP.
 4. Instruction: Direct all employees and workers in the proper care of their personally issued respiratory equipment, including daily maintenance and sanitizing procedures, etc., as described in the contractor's written Respiratory Protection Program.
 5. Inspection: All respiratory equipment shall be examined by contractor's project supervisory personnel at the beginning of each work period, including breaks and lunch breaks.
 6. Compulsory: Workers are to wear their respirators provided to them at all times while within the work area.

- A. Supervisors are to inform workers to the potential for exposure to airborne asbestos fibers.
- B. Workers are responsible for insuring that their respirators fit properly and that it is not worn loosely.
- C. The contractor is to warn workers that failure to wear the respirator or to wear it improperly may result in dismissal.

1.19 DISPOSAL ACTIVITIES

- A. It is the responsibility of the contractor to determine current waste handling, transportation and disposal regulations for the work site and for each appropriate waste disposal landfill. The contractor must comply fully with these regulations and all U.S. Department of Transportation (DOT), EPA, NESHAPS state and local requirements.
- B. The contractor will document actual disposal of waste at the designated landfill by obtaining a disposal Waste Shipment Record and providing the original to the Owner.
- 3. It is the responsibility of the contractor that waste not accumulate in the removal site. Waste bags and drums are to be transferred to a closed vehicle or dumpster used to transfer material to an approved landfill. The vehicle or dumpster is to be locked when unattended and posted with the appropriate signage.

1.20 EXPOSURE CONTROLS

- A. Provide supply air to and exhaust air from the work area to maintain a negative pressure of 0.02 inch of water. If negative air pressure of 0.02 inches is lost, work shall be halted until negative air pressure is restored. The ventilation system shall operate on a twenty four-hour basis throughout the abatement process through final clearance air sampling. The ventilation system shall be in accordance with EPA recommendations included in Appendix J of the Guidance for Controlling Asbestos-Containing Materials in Buildings.
- B. Negative pressure check shall be in accordance with section J.3.2.1, "Testing the System" as found in the EPA Guidance for Controlling Asbestos-Containing Materials in Buildings, June 1985.
 - 1. Number and Capacity of HEPA's: Compute the total cubic feet of all work space within the work area and determine and document the air moving capacity of all the filter units to be used in the work space. This measurement shall be made in cubic feet per minute (cfm) under a filter load equivalent to two inches of static pressure.

2. Negative air system shall be equipped with the following:
 - a. Magnahelic gauge to monitor the units air pressure difference across the filters and to be able to interpret magnahelic readings to cfm. NOTE: The magnahelic gauge on an air filtration device is used to indicate when filters have become loaded and need to be changed. It does not indicate negative pressure within the removal area.
 - b. Automatic shut off for filter failure or filter absence.
 - c. Audible alarm with or without flashing red light for unit shutdown.
 - d. Amber flashing warning light for filter loading.
 - e. Must have safety system that prevents units from being operated with the filter in backwards.
 3. Each negative air unit shall be on the exterior of the work area whenever possible. The duct shall be exhausted to the outside of the building. If it is not possible to exhaust outside, the duct must be placed in a locked, sealed, and unoccupied space. Indoor exhaust air must be sampled daily.
 4. Enough air filtration devices shall be used to provide a minimum of 4 air changes per hour. Provide a minimum of two standby units in the event of a machine failure or other emergency.
 5. Demonstrate to the I.H. the pressure differential in each individual work area by means of a portable manometer with a continuous strip chart recorder prior to the disturbance of any ACM. The strip chart record shall be made part of the project log. Each strip shall be dated, identified by work area and initialed by the supervisor.
- C. In a multi room abatement project provide a sufficient number of supply and exhaust units to create a stream of air away from the faces of the workers in each room and in such a way so as not to damage or compromise the integrity of the plastic isolation barriers. The engineering and placement of the HEPA units must be in such a manner as to prevent "dead air spaces" or "short circuiting".

PART 2 - PRODUCTS

2.01 TOOLS, EQUIPMENT AND MATERIALS

- A. Airless Sprayer: An airless sprayer, suitable for applications of soil encapsulating material.
- B. Asbestos Filtration Unit: Asbestos filtration units shall utilize high efficiency particulate absolute (HEPA) filtration systems.
- C. Scaffolding: Scaffolding as required to accomplish the specified work, shall meet all OSHA safety regulations.
- D. Transportation Equipment: Transportation equipment shall be suitable for loading, temporary storage, transit and unloading of contaminated waste without exposure to persons or property.
- E. Vacuum Equipment: All vacuum equipment utilized in the work area shall be equipped with HEPA filtration systems.
- F. Water Sprayer: The water sprayer shall be an airless or low pressure sprayer for amended water applications.
- G. Encapsulants: The encapsulating agents shall be penetrating sealant mixed and applied in accordance with manufacturer's instructions and shall meet the following criteria:
 - 1. Selection: Effective performance previously demonstrated by an independent testing laboratory.
 - 2. Testing: High flame retardant characteristics and low toxic fume and smoke rating.
 - A. Compatibility with all insulating material and plaster likely to be applied to the stripped surface.
 - B. Demonstrably capable of adhering to substrate surfaces.
- H. Surfactant (Amended Water): All water used for wet wiping of asbestos-contaminated material during cleanup operations shall be amended through the addition of a surfactant mixed and applied in accordance with manufacturer's instruction.
- I. Glove Bags: Execution shall be in accordance with manufacturer's instructions and requirements of Section 02082.
- J. Asbestos disposal bags: Disposal bags shall be six mil thick, polyethylene, and OSHA labeled.

- K. Mastic Solvent, Spray Poly, Spray Adhesives: Non-toxic and shall not produce noxious fumes during and after application.
- L. Polyethylene Sheeting: Shall be 4 and 6 mil. thickness as required by OSHA and the Massachusetts Department of Labor and Industries.

PART 3 - EXECUTION

3.01 PRE-ASBESTOS ABATEMENT PREPARATIONS

A. Prior to any abatement work in the area:

- 1. Seal off the entire area to any one other than trained personnel and authorized visitors.
- 2. Erect signs around the area in accordance with EPA, OSHA and this specification. Unauthorized entry during abatement process shall be provided by twenty four-hour security. Maintain a log of all people entering and exiting the work place.

B. Isolation of the work area:

- 1. Seal all walls with two layers of four-mil plastic sheet and the floor with two layers of six mil plastic sheet.
- 2. Seal off all duct openings, doors, windows, fan coil units, radiators, etc. with two layers of six mil plastic sheet.
 - A. Above 8 feet; support plastic sheeting by means of a wood (2"x4") frame where span is greater than 2 feet wide.
 - B. Below eight (8) feet the use of plywood sheets, or equivalent, is required to create a permanent critical barrier throughout the duration of work.
 - C. When a ceiling is to be removed, extend the polyethylene plastic sheeting all the way to the underfloor. Ensure that barriers are effectively sealed and taped.
 - D. Repair damaged barriers and remedy defects immediately and visually inspect enclosure prior to each work day.
 - E. Use smoke methods to test effectiveness of barriers.

C. Moveable and permanent items:

- 1. Disassemble all moveable items from the work area such as lights grills, registers, etc.

2. Thoroughly decontaminate through wet cleaning and or HEPA vacuum all furniture such as desks, chairs, file cabinets and like items will be relocated by The School Dept. before asbestos removal starts. Store the decontaminated removables in a clean storage room furnished by the Owner until the completion of the abatement work.
- D. Secure the approval of the Owner Retained Industrial Hygienist prior to the start of work for the following:
1. Enclosure, critical barriers, shower, personnel protection and decontamination procedures, and exposure control systems.
 2. Notification and permits, standard operating procedures, personnel training and testing.
 3. Proper decontamination and storage of moveable items.
 4. Security for the work area and equipment for intra-room communications.
- E. Utilities: Ventilation ducts and fans shall be shut down and locked out of service to prevent asbestos dust/fibers from being drawn into the system and spreading contamination throughout the building.
1. If a system is critical and may not be shut down according to the Owner Representative, then the Contractor must seal all equipment and ductwork under negative pressure by using tape, and plastic to insure that there will be no leakage into the ventilation system.

3.02 UTILITIES

- A. Provide all necessary connections for temporary utilities in the workplace during abatement work. Preserve the operating condition of all active ducts, piping and utilities. If any of the above will be disturbed, notify the Owner Representative immediately and undertake remedial action as required. Shut down and disconnect all electric power to the work area if required, so that there is no possibility of reactivation and electrical shock during the entire abatement process. The temporary electrical power shall be in accordance for OSHA and Electric Code for Wet Environments.
- B. After all asbestos removal has been completed, remove all heating, ventilating and air conditioning system filters and dispose of as asbestos waste. Replace all air filters with a set of new filters at the end of the decontamination work, and only after all asbestos removal and clearance air sampling has been completed, and the Owner Representative I.H. approval for tear down has been given.

3.03 ASBESTOS REMOVAL

A. Method of Removal - Major Abatement

1. Post Asbestos Warning Signs in all areas of removal.
2. Construct plastic enclosures according to Asbestos Abatement Specifications and 453 CMR 6.14. Designate emergency exits.
3. Set up removal zones, under 0.02 inches of water negative pressure, as indicated in Section 1.21(A) and (B).

The removal zone should consist of:

- A. equipment area
 - B. showers
 - C. airlocks
 - D. clean room
 - E. see section 3.01 and 3.02 of Asbestos Abatement Specifications
4. Cover all electrical panels, Junction boxes, Fire alarm equipment, controls, etc. in removal area. Cover and seal with plastic and tape.
 5. Remove all moveable items from area. Cover all non moveable items and equipment with plastic sheeting taped securely for seal.
 6. Remove all HVAC system filters after asbestos removal is completed and treat as contaminated material. At end of job provide and install new filters. Seal all HVAC openings into areas using 2 layers of 6 mil. plastic, i.e. critical barriers.
 7. Barrier all windows, doors, pipe sleeves, access panels, etc. not being used for entry and exit. Attach asbestos warning signs. Use plywood or equivalent, as necessary to meet critical barrier requirements.
 8. After all preparations have been made, approval for removal will be given by the Owner obtained Industrial Hygienist/IH firm. Approval is required prior to the commencement of work within the work area containment.
 9. The Contractor shall remove asbestos completely using appropriate tools, i.e., nylon brushes, scrapers, as necessary so that no visible residue remains. Complete removal by wiping down with amended water. All asbestos is to be kept sufficiently wetted with amended water throughout the removal process; no dry removal is permitted.
 10. Encapsulant is to be applied to all cleaned pipe surfaces following the removal of asbestos.

11. Bag material, pack and seal for disposal according to Specifications. Bagged materials must be sufficiently wetted.
12. See section 3.06, 3.07-3.08 of the Asbestos Removal Specification for clean-up procedures and final clearance monitoring.
13. After approval from the Owner obtained Industrial Hygienist/IH firm remove plastic, barricades, equipment, showers, etc.

3.04 REMOVAL PRACTICES

- A. After the removal and/or encapsulation and/or enclosure of asbestos has been completed and before removal of barriers, area shall be thoroughly wet cleaned and/or vacuumed with HEPA filtered vacuum.
- B. Waste containers shall be packed, cleaned, labled and removed from the work area prior to final clean up and monitoring.
- C. All equipment not used in final cleanup and monitoring shall be decontaminated and removed prior to final cleanup and monitoring.
- D. After first cleanup, IH shall visually examine work area for gross contamination. A second wet cleaning and/or HEPA vacuuming shall be performed. If no visible contamination is observed, the Contractor shall proceed with misting and/or encapsulation steps.
 1. Misting - Lightly mist air with amended water to precipitate airborne fibers.
 2. Allow five to six hours before next step to allow fibers to settle and for the work area to dry.
 3. Fine cleaning must take place after misting and/or encapsulating procedures.
 4. Inner layer of plastic is taken down and disposed of as asbestos waste when air monitoring results as determined by NIOSH 7400 Method indicate level is less than 0.01 f/cc.
 5. The clean level test (final test) shall be a high volume (2880 liters). The clean level shall be less than 0.01 f/cc with phase contrast microscopy.
 1. In accordance with AHERA transmission electron microscopy (TEM) sampling and analysis shall be employed for certain work areas to conform to regulations.
 2. All sampling shall be performed using aggressive methods.

3. The clean level shall be less than 70 structures per millimeter squared (mm²).
6. At the discretion of the Owner-retained I.H., wipe samples may be collected for analysis by Polarized Light Microscopy if the presence of asbestos fibers on various surfaces is suspected. A complete absence of asbestos fibers must be reported in these samples.
7. Following the successful inspection and final testing as specified herein, all plastic barriers, tapes, and disposable contaminated equipment shall also be disposed of as contaminated waste. All reusable contaminated equipment shall be thoroughly decontaminated through wet cleaning.

3.05 MONITORING, TESTING AND INSPECTION:

- A. The performance and execution of the work shall be closely and continuously monitored by the Owner retained Industrial Hygienist (IH) Consultant and their technicians.
- B. Owner-retained IH shall not be an employee of, or work in any capacity for, the Asbestos Abatement Contractor. The monitoring shall be inside the work area and surroundings to ensure full compliance with these specifications and all applicable regulations.
- C. The Contractor is to perform his own personal sampling as required by State, local and Federal rules and regulations. Personnel samples will be collected within the breathing zones for a number of workers to be determined solely by the Contractor as per OSHA 29 CFR 1926.1101.
- D. Provide full cooperation and support to the IH and their staff throughout the abatement process. The continuous monitoring and checking will include air samples in the work space; air samples in the area surrounding the work area and the outside; checking of the standard operating procedures, engineering controls, respiratory protection system, 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 people and pollution of the environment.
- E. Owner-retained I.H. shall be responsible for visual inspections prior to, during and following the removal of all asbestos, as well as for the testing and certifying that the work area is free of airborne asbestos fibers.
 1. Area sampling shall be done outside but immediately adjacent to the work barrier prior to start of removal work.

2. Area samples shall be taken each day during removal work.
 3. Area samples shall be high volume with sample volumes being approximately 2000 liters using NIOSH 7400 method. Pump flow rate shall be between 10 and 12 liters per minute (lpm).
 4. Clearance samples shall be taken using the same method as area samples. Clearance samples are to be performed under aggressive sampling conditions, i.e. fans running and with a leaf blower in the containment area to agitate and keep airborne any residual dust fibers. A minimum of 10% of the air volume in the containment space should be sampled for final clearance purposes.
 5. Aggressive Transmission Electron Microscopy (TEM) sampling and analysis will be required, in accordance with AHERA, in any removal area where the amount of material exceeds 260 linear feet or 160 square feet after October 8, 1990. Should the Contractor combine any "Items" to create a larger work area subsequently requiring TEM's, the contractor will be responsible for any additional expense.
 6. If subsequent samples (taken after initial background sampling) are in excess of 0.01 f/cc over background, IH shall notify Contractor.
 7. If subsequent background samples are equal to or greater than 0.05 f/cc work shall be halted until source of contamination is found and corrected. If source of contamination is not in the work area work may continue.
 8. Any sample taken in a non work area or clearance samples which indicate levels of 0.05 f/cc or above using NIOSH 7400 method shall be verified using Polarized Light Microscopy.
 9. In the instance where TEM is required for clearance air sampling, a turn around time of 72 working hours will be required for Transmission Electron Microscopy analysis.
- F. The Owner shall bear all costs in connection with the laboratory work required in paragraph E.3 and E.5 above by the Owner's IH for the initial analysis, however the cost of all subsequent laboratory analysis, taken because the limits specified were exceeded, shall be borne by the Contractor. Contractor shall also bear the costs of any testing which takes place after time limits set by this contract, as a result of work stoppage.

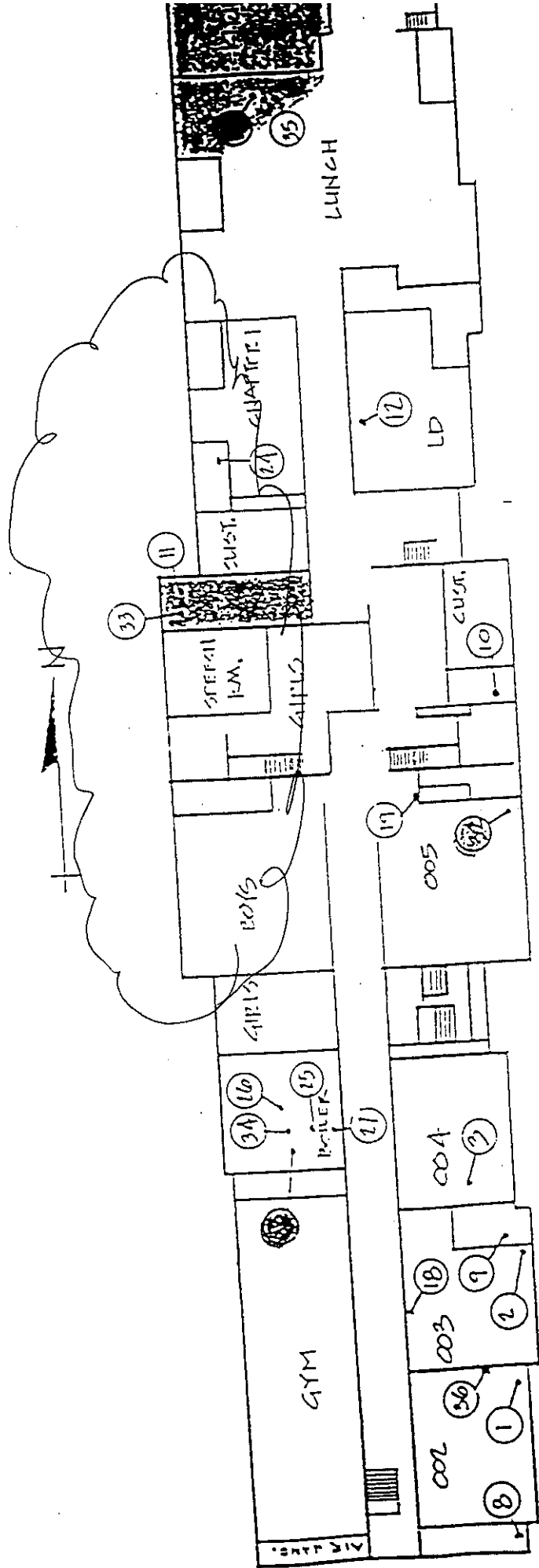
3.06 FINAL INSPECTION AND TESTING

- A. After thorough cleaning and/or encapsulation, the IH shall determine that the work space is ready for final testing and notify the Owner.

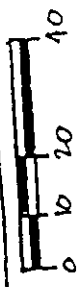
- B. The final testing shall take place under active agitation of the air in the work space with air filtration units (HEPA) and fans running.
1. One fan is required for each 10,000 cubic feet of workspace.
 2. A ½ hp leaf blower shall be used to blow down all surfaces in the work area at a minimum of 5 minutes for each 10,000 cubic feet of space.
- C. After the decontamination levels specified have been confirmed through the final testing specified herein, the plastic enclosure shall be removed; the exposed surface thoroughly wet cleaned and/or HEPA vacuumed; and the plastic and materials from equipment and decontamination facility shall be bagged and disposed of as contaminated material. A final check will be carried out by the IH to ensure that no dust or debris remain.

Note: Final air clearance shall be done by Transmission Electron Microscopy (TEM), therefore, the contractor should anticipate that it will take 72 hours to produce test results.

---END OF SECTION---



BASEMENT PLAN



 SAMPLED & FOUND TO CONTAIN ASEBESTOS (FRIABLE)

