



consultants

Asbestos Abatement Scope of Work

Purpose: Gym HVAC Replacement & Footing Repairs

Client:

**Portland Public Schools
501 N Dixon Street
Portland, Oregon 97227**

Project:

**Ainsworth Elementary - Gym HVAC Replacement & Footing Repairs
2425 SW Vista Drive
Portland, Oregon 97225**

G2 Project #: 10367-30

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Prepared By:

G2 Consultants, Inc.
16869 SW 65th Avenue, #15
Lake Oswego, Oregon 97035
www.g2ci.com

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Section 1.0 Scope of Work

1.1 Project Details:

- A. This project involves the removal and disposal of asbestos-containing materials (ACMs). All work is located at Ainsworth Elementary School, located at 2425 SW Vista Drive, in Portland, Oregon. No work is to be conducted on site until a functional decontamination facility is established.
- B. The asbestos abatement contractor (the Contractor) shall supply all labor, material services, insurance, permits and equipment necessary to carry out the work.
- C. Questions regarding the specifications and scope of work should be directed to Noal Kraft of G2 Consultants Inc. Email: noal@g2ci.com Cell: 503/784.2941. Questions regarding contractual requirements, etc. shall be directed to Jerad Lillegard, Senior Project Manager for Portland Public Schools (PPS) at jlillegard@pps.net
- D. Abatement start date will be as soon as possible after contractor selection, as agreed upon by the contractor, G2 and PPS, and shall be completed in approximately two work days. Work hours will potentially be after hours and/or weekends, and shall be determined by PPS, the contractor and G2. A representative of G2 will be on site for the duration of the abatement to provide access, address any questions/concerns and provide IH services for clearances.
- E. Water and power shall be provided by the school district. Restrooms are available in the building. Parking and staging is available.
- F. The contractor is encouraged to field verify quantities.

1.2 Work Summary

- A. **Hallway Between Cafeteria & Gymnasium**
Removal and disposal of approximately 36 lf. of asbestos-containing pipe insulation from one ~6" OD pipe. The insulated pipe is located on the East side of hallway.
- B. **Panda Room**
Removal and disposal of approximately 60 lf. of asbestos-containing pipe insulation from four 3-4" OD pipes. Two pipes are located along the North wall and two are located along the South wall.

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1.3 **Sequence of Work:** The Contractor shall adhere to the following sequence of tasks:

- A. Construction of decontamination systems as required.
- B. Work area preparation for asbestos abatement as required.
- C. Removal of all ACM from proposed work areas. Occupational Health and Safety Administration (OSHA) personal monitoring during this removal is required.
- D. Final clean-up and load out of all ACM.
- E. Transportation of ACM to an approved landfill.
- F. Final clean up (non-ACM) and removal of equipment and materials (non-ACM) after clearance has been attained.

1.4 **Special Conditions**

- A. The Contractor shall provide labor, materials and equipment to complete the work as defined by the Contract Documents, including but not limited to the following:
 - 1. The filing of all required notifications and variances, including the payment of all fees charged by all regulatory agencies.
 - 2. Work area preparation.
 - 3. General protection.
 - 4. Engineering controls construction.
 - 5. Installation of personnel and waste decontamination facilities.
 - 6. Removal of all ACM, asbestos contaminated building components and decontamination of all surfaces.
 - 7. Transportation and disposal of asbestos waste.
 - 8. Re-establishment of all building systems disrupted by the work of this contract.
 - 9. Conduct daily inspections of all adjacent spaces and clean up as required.
- B. If the Contractor has any questions as to possible errors or omissions in the Specifications, they shall immediately bring the discrepancy or other question to attention in writing and obtain a written decision as to the methods and materials to be used, before the submission of the bid. Failure to obtain clarification in writing shall not relieve the Contractor of performing the normal good practice of the industry.
- C. All waste generated by the Contractor shall be disposed of as asbestos waste to a licensed landfill.

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- D. The Contractor shall provide all required plumbing and electrical work, including temporary connections. The Abatement Contractor shall provide a temporary electric panel for his equipment and, where required, shall provide temporary lighting in accordance with all applicable codes and standards, unless other arrangements are made with the owner prior to the start of the project. The specifics shall be included in the work plan and coordinated with the Owner(s) or Owner's Representative.
- E. Bidders are required to visit the premises prior to the time of submitting proposals for the work described herein, and thoroughly inspect the conditions under which the contract is to be executed. The Contractor is responsible for field verification of all locations and quantities and determining all varying field conditions prior to the submission of their bid. Bids should include the removal of all ACM identified in the specifications and asbestos abatement drawings. Quantities provided herein are estimates and are meant to include all ACM depicted or described on the drawing.
- F. All temporary water connections shall be turned off and all water hoses disconnected at the end of the work shift. All wastewater from the abatement activities shall be pre-filtered, stored in barrels and re-used as amended water or disposed of as contaminated waste.
- G. The Contractor agrees to defend and hold the Owner and G2 Consultants, Inc. harmless from any and all fines, levies or penalties. This includes the cost to defend penalties issued by any jurisdictional authorities as a result of actions or work procedures used by the Contractor or his sub-Contractors or any persons or organizations assisting or employed directly or indirectly by the Contractor.
- H. No consideration or allowance will be granted for any misunderstanding or discrepancies of work practices or materials used without written permission from the Owner.
- I. PPS shall remove all non-fixed cabinets, shelves, furniture, and other obstructions, except where noted, in order for the contractor to access ACMs to be removed. All fixed casework, books, wall hangings, etc. will remain in place and must be protected/covered with poly by the contractor.

Section 2.0 General Conditions

2.1 Requirements

- A. All work under this contract shall be done in strict accordance with applicable Federal, State and Local regulations, standards and codes governing asbestos abatement.

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- B. The most recent edition of applicable regulations, standards, documents or codes shall be in effect. Where conflict among the requirements or with these specifications exists, the most stringent requirements shall be utilized.
- C. Copies of all standards, regulations, codes and other applicable documents, including this Specification shall be made available at all times by the Contractor at the work site in the clean change area of the worker decontamination system.
- D. The Contractor shall be required to complete all work within a time frame stipulated by the Owner(s).
- E. Abatement for all phases of work should occur during hours agreed upon by the owner and the contractor. Outdoor abatement for all phases of work may occur during daytime hours. Any other performance of work outside of these hours, including weekends and legal holidays will be permitted only upon receipt of permission, in writing, from the Owner.
- F. The Contractor shall, at the time of delivery, unconditionally own all materials delivered to the job site. The Contractor may not assign any money due, or to become due under this contract, without having received written consent from the Owner(s).
- G. The Contractor may not assign or sub-contract any of the work to be performed under this contract without having first received written permission from the Owner(s) for all such assignment and/or subcontracting.
- H. The Contractor shall guarantee all workmanship and materials free-from-fault or defect for a period of one year from job closeout.
- I. The Contractor will be expected to execute a construction contract provided by PPS.
- J. When available, storage areas will be assigned to the Contractor for equipment, tools and materials. Parking of automobiles or trucks will be determined by the Owner.
- K. The Contractor may interrupt no building services without prior written permission from Owner(s).

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- L. Applicable Federal, State and Local rules and regulations governing asbestos abatement work training requirements, and the disposal of asbestos materials are not completely documented in this Specification. The Contractor and his personnel are required to have read and familiarized themselves with such rules and regulations. Copies of these regulatory documents must be kept on the job site until completion of the work.

2.2 Definitions

Abatement: Procedures to control fiber release from ACM including removal, encapsulation, enclosure and repair.

Abatement Activities: all activities from the initiation of work area preparation through successful clearance air monitoring to be performed at the conclusion of an asbestos project or minor project.

Aggressive Sampling: A sampling method in which the air sampling technician agitates and makes airborne any settled dust and residual asbestos fibers through the use of mechanical equipment to stir up settled dust during the sampling period, thus simulating activity in that area of the building.

AIHA: The American Industrial Hygiene Association, 475 Wolf Ledges Parkway, Akron, Ohio 44311

Air Lock: A system for permitting entrance and exit while restricting air movement between a contaminated area and an uncontaminated area. It consists of two (2) curtained doorways separated by a distance of at least three (3) feet such that one (1) passes through one doorway into the air lock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.

Air Sampling: The process of measuring the fiber content of a known volume of air collected during a specific period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method 7400 or the provisional method developed by the United States Environmental Protection Agency (USEPA), which are utilized for lower detectability and specific fiber identification.

Ambient Air Monitoring: Measurement or determination of airborne asbestos fiber concentrations outside of, but in the general vicinity of the work site.

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

ANSI: The American National Standards Institute, 1430 Broadway, New York, New York 10018

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

Asbestos: Any hydrated mineral silicate separable into commercially usable fiber, including but not limited to Chrysotile (serpentine), Amosite (cummingtonite-grunerite), Crocidolite (riebeckite), Tremolite, Anthrophyllite, and Actinolite.

Asbestos Containing Material (ACM): Pure asbestos or any material containing more than one percent asbestos by weight.

Asbestos Project: Any form of work performed in connection with the alteration, renovation, modification or demolition of a building or structure which will create friable ACM.

ASTM: The American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania. 19103

Background Level Monitoring: A method used to determine airborne asbestos fiber concentrations inside and outside the work areas of a building prior to the start of abatement activities.

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

Clearance Air Monitoring: The employment of aggressive sampling techniques using the volume of air collected to determine the airborne concentrations of residual fibers. It is to be performed as the final abatement activity.

Contractor: The State, any political sub-division of the State, a public authority or any other governmental agency or instrumentality thereof, self employed person, company, unincorporated association, firm, partnership or corporation and any owner or operator thereof, which engages in an asbestos abatement project.

Decon System: A series of connected rooms, separated from the work area and from each other by air locks and used for the decontamination of workers, materials and equipment.

Demolition: The dismantling or razing of a building, including all operations incidental thereto.

Disturb: To alter or change, such as but not limited to the removal, encapsulation, enclosure or repair of ACM.

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Encapsulant (sealant) or Encapsulating Agent: A liquid material which can be applied to an ACM and which temporarily controls the possible release of asbestos fibers from the material by creating a membrane over the surface (bridging encapsulation) or by penetrating into the material and binding its components together (penetrating encapsulant).

Enclosure: The construction of air tight walls and a ceiling between the asbestos material and the facility environment, or around surfaces coated with asbestos materials, or any appropriate and approved procedure that prevents the release of asbestos materials.

Equipment Room: A contaminated area or room that is part of the worker Decon system with provisions for the storage of contamination clothing and equipment.

Fiber: An acicular single crystal or a similarly elongated polycrystalline aggregate that displays some resemblance to organic fibers by having such properties as flexibility, high aspect ratio, silky luster, axial lineation and others, and that has attained its shape primarily through growth rather than cleavage.

Friable Asbestos Material: Any material applied onto ceilings, walls, structural members, piping, duct work or any other part of the building structure that when dry may be crumbled, pulverized or reduced to powder by hand or other mechanical pressure.

Glove bag Technique: A method for removing friable ACM from heating, ventilation, and air conditioning (HVAC) ducts, short piping runs, valves joints, elbows and other non-planar surfaces in a non-contained work area. The glovebag is constructed of 10-mil transparent plastic, two inward-projecting water-wand sleeves, an internal tool pouch and an attached, labeled receptacle for asbestos waste.

Glovebag: Constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process.

HEPA Filter: A high efficiency particulate air filter capable of trapping and retaining 99.97 percent of particles (asbestos fibers) greater than 0.3 micrometers mass median aerodynamic equivalent diameter.

Incidental Exposure: Any occupational exposure to asbestos fibers caused by disturbing ACM during the performance of one's job other than during asbestos abatement activities.

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Industrial Hygienist: The professional contracted or employed by the Building Owner(s) and or Tenant to supervise and/or conduct air monitoring and analysis, perform inspections and act as the Owner/Tenant Representative.

NESHAPS: The National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61)

NIOSH: The National Institute for Occupational Safety and Health CDCNIOSH, Building J - N.E., Room 3007, Atlanta, Georgia 30333

OSHA: The Occupational Safety and Health Administration

Phase Contrast Microscopy (PCM): The measurement protocol for the assessment of the fiber content of air. (NIOSH Method 7400)

Personal Air Monitoring: A method used to determine employee's exposure to airborne fibers. Samples are collected outside the respirator in the workers' breathing zone as OSHA asbestos standards (29 CFR 1926.58).

Personal Protective Equipment: Appropriate clothing, headgear, eye protection, footwear and MSHA/NIOSH approved respiratory protection.

Wet Cleaning: The removal of asbestos fibers from building surfaces and objects by using cloths, mops or other cleaning tools that have been dampened with water.

Work Area: Designated rooms, spaces or areas of the project where asbestos abatement activities take place.

Work Site: Premises where asbestos abatement activity is taking place and that may be comprised of one or more work areas.

2.3 Regulatory Reference Standards

All work under this contract shall be done in strict accordance with all applicable Federal, State and Local regulations, standards and codes governing asbestos abatement.

The Contractor shall comply with all applicable Federal, State and Local regulations and guidelines of asbestos removal, including, but are not limited to, the following:

- A. Code of Federal Regulations (CFR) Publications:
 - 1. 29 CFR 1910.1001 Asbestos, Tremolite, Anthophyllite, Actinolite
 - 2. 29 CFR 1910.134 Respiratory Protection
 - 3. 29 CFR 1926 All Sections
 - 4. 29 CFR 1910 All Sections
 - 5. 40 CFR Part 61, Subparts A and M - NESHAPs
 - 6. 40 CFR Part 763, Subpart E - AHERA

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- B. Oregon Administrative Rules:
 - 1. Chapter 340 Division 25, Department of Environmental Quality
 - 2. Chapter 340 Division 33, License and Certification Requirements
 - 3. Chapter 437 Division 2, General Occupational Safety and Health Rules
 - 4. Chapter 437 Division 3, Construction
- 2.4 Work Procedures
- A. General Abatement Techniques
 - 1. ACM must be wetted down thoroughly and as often as necessary to prevent the emission of fibers. The ACM removal shall begin within areas closest to the decon unit and proceed towards the HEPA filtration units.
 - 2. Wet ACM shall be disposed of in appropriately lined, lockable dumpsters marked with warning signs. Waste bags and containers shall be properly labeled.
 - 3. ACM shall not be dropped or thrown from heights exceeding fifteen (15) feet above the floor. At heights above 15 feet, ACM shall be dropped into incline chutes, dropped onto scaffolding, or containerized at that height for later disposal. At heights above forty (40) feet, a dust tight chute shall be employed. The Contractor shall be aware of any State or Local requirements that may supersede these requirements.
 - 4. Visible remaining ACM shall be removed with nylon brushes or an equivalent method. During this phase, surfaces being cleaned are to be kept wet. All disposable materials and equipment shall be packaged for disposal.
 - 5. All equipment shall be decontaminated within or near the structure prior to removal. All free water in contaminated areas shall be collected and added to ACM waste and/or placed in plastic lined, leak proof containers, solidified or filtered appropriately in accordance with all applicable regulations.
 - 6. The area between the building and the dumpsters used shall be kept reasonably free of debris during shifts, and thoroughly cleaned at the end of each shift to remove ALL visible debris.
 - B. Materials to Be Utilized:
 - 1. 6-mil, fire retardant polyethylene sheeting and 6-mil bags shall be utilized to begin the initial work site preparation such as the erection of critical barriers, pre-cleaning of debris, etc.
 - 2. High quality duct tape, spray-on adhesives, glues and other barrier securing materials shall be available on-site to facilitate work area preparation
 - 3. A proper surfactant or removal encapsulant shall be employed as a wetting agent
 - 4. Tools such as wire-cutters, utility knives, scrub brushes, scrapers, etc., shall be used to aid in abatement
 - 5. Mops, rags and HEPA vacuums shall also be employed during any abatement.

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6. Asbestos Hazard Tape shall be used to cordon off the restricted areas at the base of any scaffolding utilized for abatement.
- C. Isolation of Work Areas:
1. Critical barriers shall be placed on all windows and openings in the work area. These shall be sealed and remain in place until final air clearance testing has been completed.
 2. Negative air filtration equipment is not required in the work area, but is required in the decon facility.
- D. Decontamination Chamber Construction/Maintenance:
1. A three stage decontamination (decon) chamber shall be constructed. This shall take place prior to any work being started in any area.
 2. The chamber shall be composed of a series of three rooms/spaces set up in a consecutive arrangement from the work area to the outside atmosphere. If required, a decontamination trailer shall be provided to the workers and placed in an isolated position in the uncontaminated environment.
 3. The first, innermost room of the decon chamber shall be designated as the dirty or contamination room. It will be located at the closest proximity to the enclosed work area and separated by an airlock. This in turn shall be attached to a shower room by an air lock to prevent fiber release. This shower room, which the workers shall use to decontaminate themselves of all remaining asbestos fibers when exiting work area, shall be attached to the clean room/outer room. The clean room outer room shall be used as the entrance to the actual decon chamber. It is here where street clothes and uncontaminated personnel protective equipment shall be accessed.
 4. Air locks used to separate the rooms shall be composed of fire-retardant, plastic doors and weighted to prevent contaminated air from escaping into the environment.
 5. A minimum of two layers of fire retardant, polyethylene shall be used for construction of a decontamination unit inside the work area, and a two layer ceiling shall be used to protect the integrity of the decon unit.
 6. The decon chamber doors shall be of sufficient height and width to enable replacement of equipment that may fail during work procedures.
 7. A daily log of personnel entering the work area shall be maintained in order to control the access to the decon unit and work area.
 8. Visitors and inspectors shall be provided with information and personnel protective equipment upon request and with proper identification.
 9. A decon unit shall be constructed in accordance with the applicable regulations.
 10. A minimum of one (1) layer of 6-mil, fire-retardant polyethylene sheeting shall be placed on walls, floors and ceilings.

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11. Sufficient air filtration devices (AFD) units shall be used to insure four air changes in work area per hour.
12. Material to be removed shall be sufficiently wetted with amended water prior to removal.
13. Workers will wear respiratory protection as required by OSHA during abatement and clean up.
14. Materials will be removed and contained daily. No ACM debris shall be left on the ground outside of the building during overnight.
15. Bagged waste will be removed from the work area, double bagged in either the decontamination area or separate bag exit chamber, and stored in a stationary, sealed container.

E. Final Clean-Up of Work Area:

1. All surfaces in the work area shall be cleaned using HEPA vacuums and wet wiping as necessary.
2. No visible dust or debris shall be observed within the work areas, and around the perimeter of the structure.
3. After completion of clean-up operations, the Contractor shall notify the Consultant that the containment is ready for post-abatement ambient sampling. After air samples are found to document acceptable airborne fiber concentrations of less than the regulatory threshold of 70 structures/mm² for the contained areas greater than 160 sq. ft., the containment provisions may be removed. PCM post-abatement verification samples will be collected in contained areas less than 160 sq. ft. Those containment provisions may be removed when the samples are found to document acceptable airborne fiber concentrations of 0.01 f/cc.

2.5 Personnel Qualifications and Requirements

- A. All Contractor personnel involved with asbestos work must be trained and tested prior to any work, and shall be thoroughly familiar with the Contractor's standard operating procedure for the asbestos abatement work. All personnel shall undergo the specific medical examinations required by OSHA. The superintendent and the foreman shall be thoroughly familiar with all applicable regulations and practices for asbestos work and shall have participated in at least two abatement projects of similar size and scope within the past two years. All personnel shall be in possession of valid respirator fit test paperwork. Anyone without the above qualifications shall not be allowed to work during the abatement phase at any time.

Superintendent and supervisor qualifications shall consist of:

1. Training and knowledge of applicable regulations and expertise in safety and environmental protection as evidenced by the participation in successful completion of, and certification by a training course offered by an EPA accredited Asbestos Supervisor's course.

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2. Experience with abatement work as evidenced through participation in at least two asbestos abatement projects, similar in size and scope to this project.
 3. Fluency in English and the languages spoken by all employees, or a designated interpreter for each language shall be available on each shift. A list of designated interpreters and their work schedules shall be provided for the Owner(s).
- B. The superintendent or supervisor shall maintain a permanently bound project logbook that will:
1. Identify the facility, Owner(s), Agent, Contractors and project.
 2. Define each work area.
 3. Record completely all pertinent facts relating to the project.
 4. Record date, time and name after each entry.
 5. Have a daily sign-in for each and every individual entering into the work area. They must provide, in legible print, name (first and last), worker license number, the time and date entered and exited and proof of approved visitor status.
 6. Dates of inspections and documentation of pass/fail of inspections.
 7. A summary of work accomplished at the end of each shift.
 8. Notes and comments.
- C. The project supervisor shall also be responsible for the following tasks:
1. Assuring that the decontamination chambers are kept clean.
 2. Surveying the work area a minimum of two times per shift for proper housekeeping, safety precautions, barrier integrity and integrity of any air hoses. The supervisor shall record objective observations.
 3. Ensure that each worker is wearing proper personal protective equipment and is trained in its use.
 4. Ensure that all workers are certified and licensed.
 5. Take precautions to prevent over stressing workers.
 6. Ensure worker qualifications consist of the following:
 - a. Training, as evidenced by the participation in, successful completion of, and certification by an approved asbestos abatement worker's course.
 - b. Familiarization with the standard operating procedures for asbestos abatement work.
- D. There shall be a sufficient number of trained and qualified workers, foremen and superintendents to accomplish the work in accordance with the required schedule. Since general work cannot start prior to the successful decontamination of the work area, it is imperative that a sufficient number of trained personnel be engaged throughout the abatement process. No untrained, unqualified or unapproved person shall be employed to hasten completion of the abatement work.

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2.6 Owner Responsibilities

- A. The Owner(s) shall provide the utilities needed by the Contractor to complete the abatement project. Said utilities shall include electric current to supply negative air units, vacuums and other equipment needed within the work area or decon and a water source.
- B. The Owner(s) shall provide to the Contractor a list of all daily and emergency phone numbers needed during the course of the project including but not limited to fire, police, ambulance and other emergency services.

2.7 Consultant Responsibilities

- A. The Consultant shall be hired by the Owner(s) and be independent of the Contractor on the job.
- B. All air monitoring specified in the Air Monitoring Section of this Specification shall be adhered to by the Consultant.
- C. The technician on site will make inspections after each stage of the work is completed to assure proper completion before the next stage begins. Inspections will take place after plastic enclosure is set up (prior to removal) and after clean up phase.
- D. The Consultant is responsible for daily inspections during all phases of the removal project to ensure the work is being done properly with no outside work area contamination.
- E. The Consultant has the authority to stop work due to lack of cooperation by the Contractor, contamination of areas outside the work area, or any violations of the Specifications, or Federal, State and Local regulations.
- F. If any inspection fails, the Consultant shall notify the Contractor stating the reason for the failure. The Contractor shall correct the problem and the Consultant shall perform another inspection. This process shall be repeated until the Contractor's work has passed inspection. The Contractor shall be responsible for additional air monitoring and stand-by costs.
- G. If any air test exceeds acceptable levels (outside work area, greater than .01 f/cc; or inside work area levels exceeding OSHA standards), the Consultant shall notify the Contractor, who shall stop work and correct the problem immediately. If the fiber levels remain high the Consultant will stop the work until the Contractor corrects all problems. The Contractor shall be responsible for additional air monitoring and stand-by costs.

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- H. If the final air tests exceed 0.01 f/cc for containments under 160 sq.ft., or 70 structures/mm² for containments 160 sq. ft. or greater, the entire work area shall be re-cleaned immediately upon receipt of air test results. The area shall then be re-tested at no additional cost to the Owner(s).

Section 3.0 Execution

3.1 Standard Operating Procedures

A written description of Contractor's standard operating procedures for completing the work shall be submitted to ensure maximum protection and safeguard from asbestos exposure to workers, visitors, employees and the environment. The standard operating procedure shall consist of:

- A. Methods to maintain security to prevent unauthorized entry into the work space.
- B. Maintenance of an entry log record that ensures that the Contractors' personnel are in accordance with applicable regulations.
- C. Proper protective clothing and respiratory protection use prior to entering the work area.
- D. Safe practices to prevent accidents in the work space, especially from electrical shocks, slippery surfaces and entanglements in loose hoses and equipment.
- E. A survey of the work areas at a minimum of once per work shift to ensure that the workers, personal protective equipment is not ripped or torn and that respiratory protection is worn at all times and that engineering systems used minimize exposure to fibers in the work space are in place.
- F. Safe work practices including, provisions for inter-room communications and the exclusion of eating, drinking, smoking and any activity that may break a respiratory protection seal.
- G. Proper exit procedures from the work space to the outside through the decontamination facility.
- H. Methods for packaging, labeling, loading, transporting, and disposing contaminated material in a way that minimizes exposure and contamination.
- I. Emergency evacuation procedures for medical or safety reasons (i.e. fire and smoke) so that exposure to ACM shall be minimized.
- J. Provisions for effective supervision, including personal air monitoring and any general area air monitoring during the work.

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3.2 Notifications and Permits

- A. Notifications: The Contractor shall provide required notification to regional, state and local authorities having jurisdiction on the project. The Contractor shall also secure all permits required for the work, including disposal of asbestos in an approved landfill.
- B. Variances: The Contractor shall be responsible for obtaining any variances to perform the abatement work. The variance request shall be submitted to the Owner's Consultant for approval prior to submission to the regulatory agencies. Payment of fees for the processing of any variance request; shall be made by the Contractor.

3.3 Warning Signs and Labels

- A. The Contractor shall erect warning signs around the work space and at every point of potential entry from the outside. Signs should be in accordance with OSHA standard 29 CFR 1910.1001. The warning signs shall be a bright color so that they will be easily noticeable. The size of the sign and the size of the lettering shall conform to the OSHA requirements.
- B. The contractor shall provide the OSHA and NESHAPS required labels for all plastic bags and all drums utilized to transport asbestos contaminated material to the landfill.
- C. The contractor shall provide any other signs, labels, warning and posted instructions that are necessary to protect, inform and warn people of the hazard from asbestos exposure these shall be posted in a prominent and convenient place for the workers.

3.4 Emergency Precautions

- A. The work area is to be restricted only to authorized, trained, and protected personnel. These may include the Contractor's employees, employees of Sub-Contractors, Client's employees and representatives, State and Local inspectors and any other designated individuals. A list of authorized personnel shall be established prior to job start and posted in the clean room of the worker decontamination facility.
- B. A logbook shall be maintained in the clean room area of the worker decon system. Anyone who enters the work area must record his name, affiliation, time in and time out for each entry.
- C. Entry into the work area by unauthorized individuals shall be reported immediately to the Client by the Contractor. These events should be clearly detailed in the site logbook.

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- D. Access to the work area shall be through a single worker decon system located at a designated location of the work site. All other means of access (doors, windows, hallway, etc.) shall be blocked or locked to the prevent entry to or exit from the work area. The only exceptions for this rule are the waste pass-out air lock that shall be sealed except during the removal of containerized asbestos waste from the work area and emergency exits for use in case of fire and/or accident. Emergency exits shall be sealed with fire retardant polyethylene sheeting and tape until needed. These emergency exits shall be clearly marked in English and the language of a majority of the workers.
- E. The Contractor should have control of site security during all operations whenever possible, in order to protect work efforts and equipment.
- F. The Contractor shall have the Client's or Owner's assistance in notifying building occupants of impending activity and enforcement of restricted access by all employees.

Section 4.0 Personal Protective Equipment

4.1 Respiratory Protection

- A. Respiratory protection shall be worn by all individuals inside the work area from the initiation of the asbestos project until all areas have successfully passed clearance air monitoring.
 - 1. All respiratory protection shall be MSHA/NIOSH approved in accordance with the provisions of 30 CFR Part 11. All respiratory protection shall be provided by the Contractor and used by workers in conjunction with the written respiratory protection program.
 - 2. The Contractor shall provide all workers, foreman, superintendents, authorized visitors and inspectors personally issued and marked respiratory equipment approved by NIOSH and MSHA. When using respirators with disposable filters, the Contractor shall supply replacements as needed.
 - 3. Workers shall be provided with personally issued and individually marked respirators. Respirators shall not be marked with any instrument that will alter the fit of the respirator in any way. Only waterproof identification markers will be used.
 - 4. The Contractor shall ensure that the workers are qualitatively or quantitatively fit tested for any negative pressure respirator by an Industrial Hygienist initially and every six months thereafter with the type of respirator to be used. Qualitative fit testing may only be used for half-mask respirators.
 - 5. Whenever the respirator design permits, workers shall perform the positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow as specified by the manufacturer.

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6. No facial hair (beards) shall be permitted to be worn when wearing respiratory protection that requires a mask to face seal.
 7. Contact lenses shall not be worn in conjunction with respiratory protection on asbestos projects.
 8. If a worker wears glasses, a spectacle kit to fit their respirator shall be provided by the Contractor at the Contractor's expense.
 9. Respiratory protection maintenance and decontamination procedures shall meet the following requirements:
 - a. Respiratory protection shall be inspected and decontaminated on a daily basis in accordance with OSHA 29 CFR 1910.134(b).
 - b. HEPA filters for negative pressure respirators shall be changed after each shower, or sealed properly.
 - c. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures.
 - d. Air-line respirators with HEPA-filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filtered/power pack assemblies shall be decontaminated in accordance with manufacturer's recommendations.
 - e. Respirators shall be stored in a dry place and in such a manner that the face piece and exhalation valves are not distorted.
 - f. Organic solvents shall not be used for washing of respirators.
 8. Authorized visitors shall be provided with suitable respirators and instruction on the proper use of respirators whenever entering the work area. Fit testing shall be done to ensure proper fit of respirator.
- B. The minimum respiratory requirements for this project are as follows:
1. Half-mask or full face air-purifying respirators with HEPA filters shall be worn during the preparation of the work area, performance of repairs (e.g. using glovebag techniques), during removal techniques and final cleanup procedures provided airborne fiber concentrations inside the work area are less than 0.1 f/cc.
 2. Full face piece powered air-purifying respirators (PAPR) equipped with HEPA filters shall be worn during the removal, encapsulation, enclosure, repair and/or other disturbance of friable ACM whenever airborne fiber concentrations inside the work areas are equal to or greater than 0.1 f/cc and less than 2.0 f/cc. A supply of charged replacement batteries, HEPA filters and flow test meter shall be available in the clean room for use with powered air-purifying respirators. HEPA filters shall be changed daily or as flow testing indicates change is necessary. Any type C supplied-air respirator operated in continuous flow may be substituted for a powered air-purifying respirator.

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3. Full face piece type C supplied-air respirators operated in pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus shall be worn during gross removal, demolition, renovation and/or other disturbance of ACM whenever airborne fiber concentrations inside the work area are equal to or greater than 10.0 f/cc.
4. Full face piece type C supplied-air respirators operated in pressure demand mode with HEPA filter disconnect protection shall be worn during gross removal, demolition, renovation and/or other disturbance of ACM whenever airborne fiber concentrations inside the work area are equal to or greater than 2.0 f/cc and less than 10.0 f/cc.
5. Use of single use dust respirators is prohibited for the above respiratory program.

4.2 Additional Personal Protective Equipment

- A. The Contractor shall provide to all workers, foremen, superintendents and authorized visitors and inspectors, protective disposable clothing consisting of full body coveralls and head covers.
- B. The Contractor shall provide eye protection (contact lenses shall not be worn and spectacle kits which fit each personal respirator shall be issued), hard hats and safety shoes as required by job conditions and safety regulations. Safety shoes and hard hats shall be approved in accordance with ANSI Z89.1 1969 and ANSI Z41.1 1967.
- C. Reusable footwear, hard hats and eye protection 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 the work area to the outside area through the decontamination facilities.
- E. If it is absolutely necessary that non-disposable clothing be worn for the asbestos project, laundering services shall be conducted in accordance with 29 CFR 1926.58.

Section 5.0 Containment and Preparation

5.1 Containment Construction

- A. For each work area the Contractor shall provide decon facilities located in a location agreed upon by the Owner(s)/Client.
- B. The decon system for workers and authorized visitors shall consist of three rooms equipped with three air locks as follows: 1) clean room at entrance and air lock, 2) shower room at center and airlock, and 3) equipment room/decon room leading to

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the work area and airlock. Remote decon system may be necessary in certain situations. The use of a remote decon system shall be discussed in the work plan.

- C. The Contractor shall provide or post the following in the clean room:
1. A copy of the (US EPA) Regulations for Asbestos, 40 CFR 61 Sub Parts A and M and a copy of OSHA Asbestos Regulations, 29 CFR 1926.5.
 2. A list of telephone numbers for local hospitals, location of hospitals and/or emergency squad, local fire department, the Owner(s) and the applicable regulatory agencies.
 3. A copy of all Material Safety Data Sheets (MSDS) for hazardous chemicals used during the asbestos project.
 4. Provide lockers or pegs for storage of workers' street clothes in the clean room. Provide in the same room uncontaminated disposable protective clothing and equipment. The clean room shall be used to change from street clothes in into disposable protective clothing prior to entering into the contaminated area. Additionally, the clean room shall be used to dress into street clothing after they have showered and dried in the shower room as they exit from the contaminated area.
- E. Provide shower facilities with hot and cold water arranged to provide complete showering of workers and visitors as they exit contaminated areas. Provisions shall be made to prevent contaminated water run-off from the shower room. The shower room facilities and size shall be adequate to allow decontamination and thorough washing of all workers and authorized visitors within the 15 minutes escape time allowed in the event of air compression failure.
1. There shall be one shower per six full-shift abatement personnel calculated on the basis of the largest shift.
- F. Provide the equipment room with storage for contaminated clothing and equipment. In this room, workers and authorized visitors shall dispose of their protective clothing except the respirator, as they prepare to enter the shower room.
- G. The asbestos contaminated equipment wash and wipe room shall be equipped with the facilities to wash and wash the hand tools and other equipment used inside the work space prior to removing them from the job site. Provisions must be made to prevent any contaminated water run-off from the wash and wipe room.
- H. All asbestos contaminated water shall be filtered or treated as asbestos containing waste. The water shall be drained, collected and filtered through a system with at least 5.0 micron particle size collection capability. A system containing a series of several filters with progressively small pore sizes shall be used to avoid rapid clogging of the filtration system by large particles. Filtered wastewater shall be discharged into a sanitary sewer. Used filters shall be disposed of as asbestos containing waste.

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5.2 Waste Loadout Requirements

- A. Asbestos contaminated waste that has been containerized shall be transported out of the work area through a designated area established in the contractor's work plan.
- B. Waste pass-out procedures shall utilize two teams of workers, an "inside" team and an "outside" team.
- C. The inside team, wearing appropriate protective clothing and respirators shall clean the outside, including bottoms, of properly labeled containers (bags, drums, or wrapped components). Using HEPA vacuums and wet wiping techniques, they shall transport the containers into the waste container pass-out air lock. No worker from the inside team shall further exit the work area.
- D. The outside team, wearing protective clothing and appropriately assigned respirators, may enter the structure from outside, within the load out area, enclose the containers in clean, labeled, 6-mil polyethylene bags or sheeting as the items' physical characteristics demand, and remove them from the air lock to the outside. No worker from the outside team shall further enter the work area through this air lock, which shall be secured to prevent unauthorized entry.

5.3 Engineering Controls

- A. The Contractor shall maintain the entire structure and surrounding areas as a regulated area throughout the project.
- B. If samples collected outside of the work area during abatement activities indicate airborne fiber concentrations greater than 0.01 f/cc or pre-measured background levels, work shall immediately stop for inspection and procedures review. Cleanup of surfaces outside of the work area, using HEPA vacuums or wet cleaning techniques, may be necessary.
- C. Disposal shall be at an approved landfill, transfer at a licensed transfer station and a manifest form will be signed by the landfill owner documenting receipt and acceptance of the asbestos-containing waste.
- D. All materials subject to damage shall be stored off of the ground, away from wet or damp surfaces, and under a protective cover to prevent damage or contamination.
- E. Airtight and watertight containers shall be provided to receive and retain any asbestos-containing or contaminated materials for storage until disposal at a disposal site. The containers shall be labeled in accordance with OSHA Regulations 29 CFR 1926.58. Containers (dumpsters) are to be locked between shifts.

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- F. Adequate HEPA filter equipped ventilation units, including HEPA filter replacements, shall be provided by the contractor.
- G. The contractor shall provide tools, respirators, and filter replacements necessary.
- H. The Contractor shall provide the necessary water filtration units to filter wastewater through a 0.5 micron final filter.
- I. The Contractor shall have available ladders and/or scaffolds of sufficient dimension and quantity so that all work surfaces can be easily and safely reached by inspectors. Scaffold joints and ends shall be sealed with tape to prevent incursion of asbestos fibers. Scaffolding shall comply with the OSHA requirements.

5.4 Preparation

- A. General
 - 1. Critical Barriers: All asbestos abatement work involving friable ACM and non-friable ACM shall require the installation of critical barriers at all penetrations to the work area.
 - 2. All electrical equipment used by Contractor in the work area must be protected by GFI circuits. The electrical supply to the work area must be located outside the containment, where feasible.

Section 6.0 Removal

6.1 Materials

- A. Contractor must furnish all labor, materials, equipment, and subcontractors necessary for removal and disposal of ACM in a manner consistent with these specifications. These materials include but are not limited to:
 - 1. Fire-retardant polyethylene sheeting (6 mil minimum thickness)
 - 2. Staples, nails, and tape capable of sealing joints and securing polyethylene to all necessary surfaces
 - 3. Surfactant mixed in recommended proportions
 - 4. Containers to receive and retain ACM with appropriate labels
 - 5. Warning signs and labels
 - 6. Glove bags
 - 7. Encapsulants
 - 8. Other Materials: All necessary materials for removal and disposal of asbestos in compliance with all applicable codes and regulations, and these specifications.

6.2 Equipment

- A. Provide suitable tools for asbestos removal, including but not limited to scrapers, brushes, razor knives, wrenches, tools for constructing containment and decontamination units, brooms, carts, and safety equipment.

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- B. Provide suitable air moving and exhaust equipment, including but not limited to:
 - 1. A method for maintaining pressure differential of 0.02 inches of water column inside decon from outside.
 - 2. HEPA-filtered vacuums
 - 3. Recording manometers for monitoring the pressure inside decon relative to outside

- C. No equipment shall cause suspension of ACM within work area or discharge of asbestos fibers outside of work area.

6.3 Asbestos Removal

This section is intended to be used as a general specification for asbestos removal in work area for any particular asbestos abatement project for Owner. Consult the Scope of Work for each individual project for more specific asbestos removal requirements.

- A. Asbestos Removal, Friable Materials
 - 1. Prepare site as per section 5.4.
 - 2. Spray asbestos material with amended water using spray equipment capable of providing a water application to reduce the release of fibers. Saturate friable material sufficiently to wet the debris and prevent ALL visible emissions.
 - 3. Spray the asbestos material repeatedly during removal process to maintain wet condition and minimize asbestos fiber dispersion. The spraying must not be used as a technique to remove or dislodge ACM.
 - 4. Remove saturated asbestos material in small sections. As it is removed pack the material in sealable 6 mil polyethylene bags and place in appropriately labeled (29 CFR 1926.1101(k)(8)(iii)) container for transport. Material must be placed in containers in a prompt manner consistent with 29 CFR 1926.1101(g)(1)(iii).
 - 5. Waste Load-out Procedure
 - a. Seal bags or containers. Clean external surfaces of containers thoroughly by wet cleaning in the designated part of work area that is part of equipment decontamination unit.
 - b. Move containers to dirty transport staging area, wet-clean each container thoroughly, and move to a clean transport staging area pending removal from the property. All waste water from these activities must be collected and filtered.
 - c. When disposal bags are used, the bagged material must be placed within a second bag in equipment decontamination unit. The second, outer bag must be labeled with all applicable warnings, including D.O.T. labeling.
 - d. When larger pieces of material are to be disposed of, the material must be wrapped in 2 layers of fire-retardant polyethylene sheeting and properly labeled in equipment decontamination unit.
 - 6. Secondary Removal

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- a. After completion of gross removal work, all surfaces from which asbestos has been removed must be wet-brushed with a wire brush and/or wet-cleaned by an equivalent method to remove all visible material. During this work the surfaces being cleaned must be kept wet.
- b. Consultant will individually approve each area of encapsulation verbally or in writing prior to commencement of encapsulation.
- c. Encapsulant usage is not necessary for this project.

6.4 Final Cleaning

A. Cleanup

1. Remove visible accumulations of asbestos material and debris. Wet-clean all surfaces within work area.
2. Sealed containers and all equipment in use in work area must be included in the cleanup and must be removed from work area via equipment decontamination unit, at an appropriate time in the cleaning sequence.

6.5 Inspections after Removal

A. Inspections after Removal (see also Section 8.3)

1. If Consultant finds visible accumulations of asbestos debris in work area after the completion of the visual inspection, Contractor shall repeat wet-cleaning until work area is in compliance, at Contractor's expense.
2. When an inspection by Consultant in the presence of Contractor determines that the area is free of accumulations of dust and visible asbestos debris and the final air clearance has been met, decontamination unit shall be removed, the area thoroughly wet-cleaned, and materials from equipment room and shower room disposed of as contaminated waste.
3. A final inspection will be carried out by Consultant in the presence of Contractor to ensure that no dust or debris remains on surfaces as a result of dismantling operations.

6.6 Special Removal Procedures

A. Reserved

Section 7.0 Waste Disposal

7.1 Waste Containers and Labeling

A. Disposal

1. Preparation and Security of Waste Holding Areas
 - a. Prepare enclosed transport vehicles and/or enclosed dumpsters with at least 2 layers of 6 mil fire-retardant polyethylene sheeting.
 - b. Secure transport vehicles and dumpsters with padlocks. Dumpsters and waste transport vehicles must be locked at all times while

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- engaged in asbestos disposal on Owner's property, except when waste materials are being loaded into these items.
2. Storage and Disposal of Containers
 - a. Containers of ACM shall not be stored in uncontaminated areas, but must be moved directly from work area to an enclosed dumpster in enclosed carts.
 - b. ACM must be disposed of at the selected and approved disposal site in accordance with requirements of all applicable disposal authorities.
 - c. Disposal documents and receipts must be submitted to Consultant as part of the close-out documentation.
 - d. The contractor must disclose the intended use of a dumpster on site as part of the work plan.
 - B. Discharge of Waste Water
 1. All waste water must be filtered through a medium that is capable of removing all suspended particles of a diameter greater than or equal to 5 microns.
 2. All filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

Section 8.0 Consultant Project Oversight

8.1 Project Air Monitoring

- A. Prior to the commencement of large project abatement activities the work area may be pre-tested to determine ambient airborne asbestos levels. Representative samples, determined by the Consultant, inside the work area and outside the work area shall be collected throughout the proposed work area during normal occupancy activities and circumstances.
- B. The following is an example of air samples that may be collected on a daily basis at a large project work site:
 1. One sample from each side of the structure within 10 feet of isolation barriers.
 2. One sample inside the uncontaminated entrances of each worker and waste decontamination unit, or representative samples at the discretion of the Consultant.
 3. It is also highly recommended that exterior samples be taken to document outside air fiber levels if conditions permit.
 4. Minimum volume required to be drawn on area samples should be 1,200 liters.

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- C. Personal air sample results shall be considered representative of the workers inside the work area containment. Personal samples to be collected by the contractor.
 - D. Air sampling equipment shall not be placed in corners or near any obstructions such as furniture or air handling systems that may unduly affect airflow.
 - E. All samples shall have a chain of custody to record who collected, transported, received and analyzed samples.
 - F. Air sample analysis, other than AHERA clearance samples, shall be carried out in accordance the NIOSH 7400 Method (Revised) utilizing counting Method "A".
 - G. All applicable requirements for quality assurance and quality control in the laboratory must be in place in order to ensure the accuracy of the analysis results.
 - H. All samples shall be read onsite in a clean area provided by the school. Sample results shall be available approximately two (2) hours following the completion of each sample. TEM results for AHERA clearances will be available by the end of the next business day, if the samples are collected prior to noon. If after noon, the results will be available two business days later.
- 8.2 Personnel Air Monitoring**
- A. At the end of the project the Contractor shall provide complete documentation of the OSHA required monitoring of on-site personnel that was conducted during the abatement activities. This information will document the worker exposure on this particular project.
 - B. The Consultant may conduct additional personnel monitoring for the purpose of verifying effective work practices. The results of the samples can be made available to the contractor upon request. This additional monitoring does not relieve the contractor of the responsibility to conduct OSHA required monitoring.
- 8.3 Final Clearance Monitoring**
- A. Sampling should commence a minimum of one (1) day after the area is completely free of visible dust and debris, as documented during a visual inspection by the consultant.
 - B. Samples shall be collected in a random fashion inside the work area. The equipment shall be placed so as to obtain a representative sample of the entire work area. AHERA clearance sampling shall be conducted according to AHERA regulations.
 - C. Aggressive sampling procedures shall be used within the work area where required. Forced air equipment and fans shall be utilized for this purpose, according to the applicable regulations.

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- D. Final air clearance samples shall require the collection of a minimum volume of 1,200 liters.
 - E. Any homogenous work area under 160 sq. ft. that does not meet the clearance criteria of 0.01 fibers per cubic centimeter (f/cc), or pre-abatement levels, shall be thoroughly re-cleaned using wet methods, with negative pressure ventilation systems in operation. Upon completing new samples shall be collected in the manner prescribed above. This process shall be repeated until the work site passes the test. The same goes for work areas 160 sq. ft. or greater, if the results of the samples don't meet the AHERA clearance criteria of 70 structures/mm².
 - F. The release criterion shall be applied to each work area independently.
 - G. After final inspections and final air testing are complete and the results known, Consultant will advise Contractor of the test results. When a work area fails either the inspection or the final air testing, the area must be re-cleaned, re-inspected and re-tested. The sequence of re-cleaning and re-testing shall continue until the area passes the inspection and the final air test. When work area has passed final air test, Contractor will be informed immediately.
- 8.4 Close-out Documentation**
- A. After final inspections and final air testing are complete and the results known, the Contractor is to provide all close-out documentation to the Consultant within 15 days of the final day on site.

- END OF SECTION -

APPENDIX A

Asbestos Abatement Drawings

General Notes

1. This drawing is provided to depict approximate locations of the work.
2. Contractor shall coordinate all work with the owner, including but not limited to scheduling, security, lockout/tagout, staging/storage, salvage and for determinations on protect and save items.
3. Contractors/subcontractors performing abatement and demolition activities on painted walls shall comply with all applicable Federal, state and local regulations for lead-based/lead-containing paint.
4. Contractor shall field verify all removal quantities, demolition items for access to abatement materials as well as all items to be protected and/or salvaged.
5. PPS shall remove all non-fixed cabinets, shelves, furniture, and other obstructions, except where noted, in order for the contractor to access ACM to be removed. All fixed casework will remain in place.

General Notes Cont.

6. Mechanical, electrical or other systems to be disconnected/de-energized shall be coordinated with the owner prior to the start of demolition/abatement.
7. All systems and finishes outside of the work area(s) shall be protected from damage as a result of the demolition/abatement activities.
8. Finishes within the work area(s) shall be protected and/or repaired if subject to damage resulting from the demolition/abatement activities.
9. Contractor is responsible to remove and properly dispose all waste and debris generated as a result of the demolition/abatement activities.
10. All regulated waste generated as a result of the demolition/abatement activities must be stored in locked containers onsite, if arranged with the owner, or removed offsite. Waste of any kind shall not be stored inside the building off-shift.

Abatement Notes

1. Remove and dispose of all ACM identified on the abatement drawings and in 20100, Section 1.2 Work Summary. Drawings may not show all ACM to be removed. Refer to the abatement notes and Work Summary section in 20100 for additional details and tasks included in this scope of work.
2. The contractor shall be responsible for cleaning or removal and disposal of any items that become contaminated as a result of asbestos abatement work.
3. Contractor shall capture and filter all water used during asbestos abatement.

Key Notes

— Removal and disposal of asbestos-containing pipe insulation

Notes:

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Client: Portland Public Schools
 Project: Ainsworth Elementary School
 Location: 2425 SW Vista Ave.
 Portland, OR 97201
 G2 Project #: 10367-30

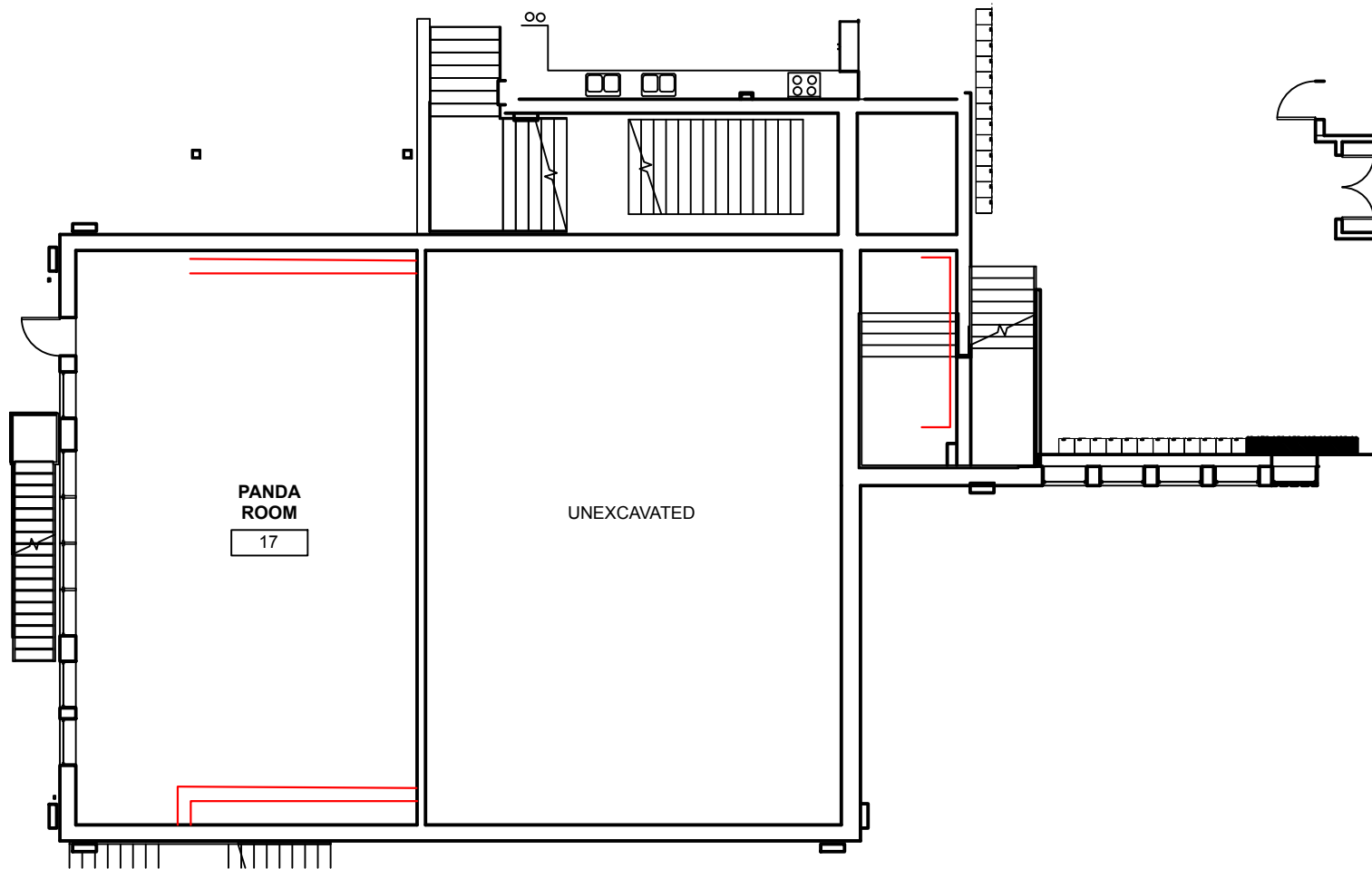
Ainsworth Elementary School
 Gym HVAC Replacement & Footing Repairs
 Portland, OR
 ACM Abatement Locations


 consultants
 16869 SW 65th Avenue
 #15
 Lake Oswego, OR 97035
 888.998.g2ci
 888.887.6422 fax
 www.g2ci.com


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Date:
 9-24-18
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 BEM

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Asbestos Abatement