



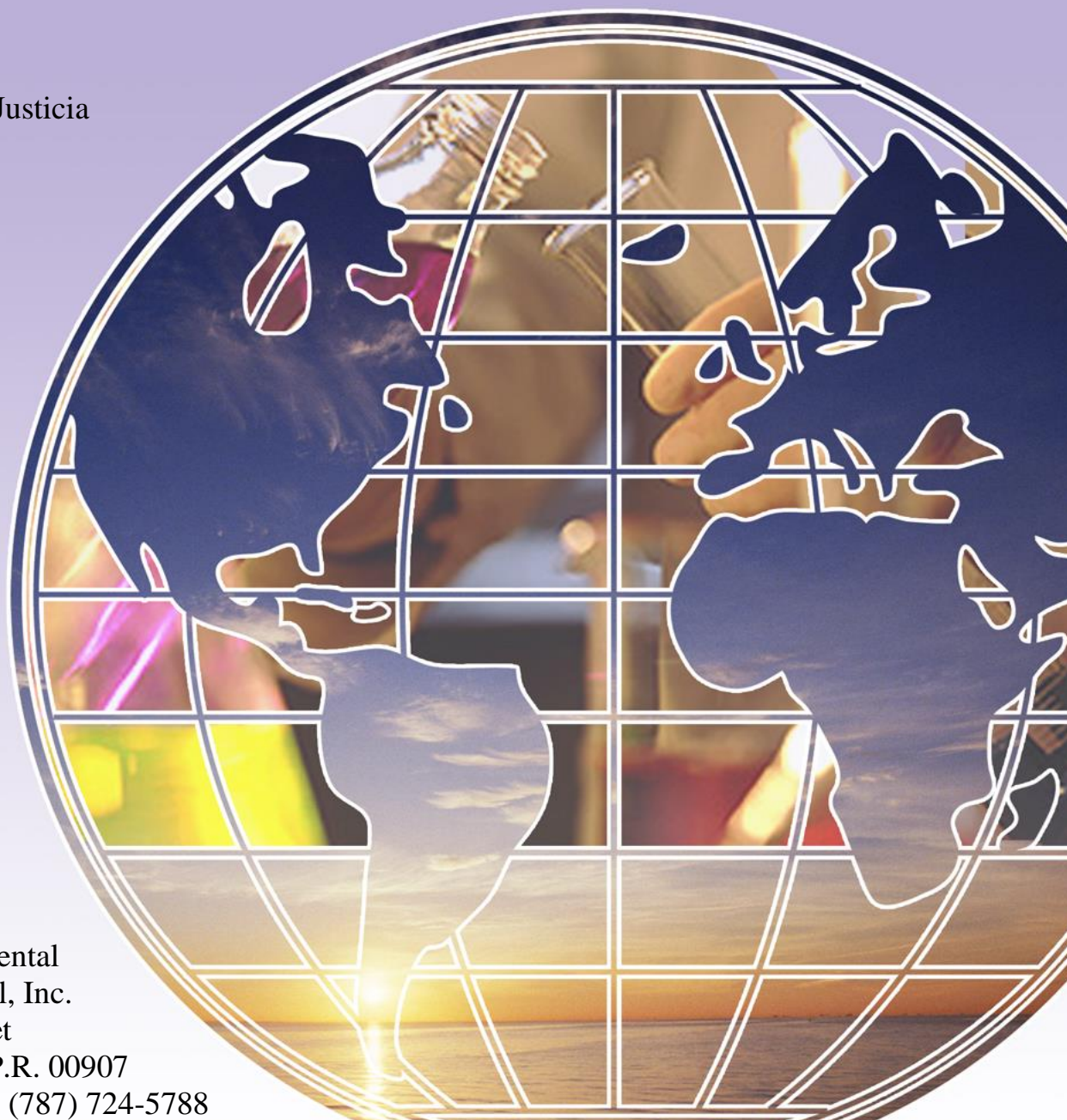
**Specifications for Selective Asbestos Containing  
Spray On Ceiling Removal located on  
6<sup>th</sup> and 7<sup>th</sup> Floor  
Centro Judicial de Bayamon**

Prepared For:  
Tribunal General de Justicia

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## **SECTION 1000 - SUMMARY OF WORK**

### **1.0 PART 1 – SCOPE OF WORK**

#### **1.01 SUMMARY**

Work Covered by the contract documents is the removal and disposal of damaged asbestos containing spray on ceilings (stucco) located along the edges (above the wooden trims), or in their vicinity on the ceilings. The damage was caused by repeated earthquake aftershocks. Material is located in nine (9) courtrooms; six (6) courtrooms located on the 7<sup>th</sup> floor (701, 702, 703, 704, 705 and 706) and three (3) courtrooms (601, 603 and 605) located on the 6<sup>th</sup> floor (see typical appearance showing damages along the edges below). The work is to be performed in Centro Judicial de Bayamon (see site location in Appendix I).



Scope of work does not include obtaining the necessary DRNA permits, as they will be obtained by the owner representative, including provision of notification to relevant agencies (EPA).

In each of the work areas, two (2) abatement phases shall be conducted. The contractor shall provide a team of enough AHERA/DRNA asbestos certified workers/supervisors as to ensure task completion within the time frame stipulated in section 1.02:

- Phase 1-A pre-abatement cleaning phase of the courtroom, including cleaning of all the surfaces inside the courtrooms, including A/C diffusers/registers, floors, walls, carpets, furniture, etc.
- Phase II- An ACM abatement phase including removal/disposal as ACM of damaged asbestos containing spray on ceilings along the edges and on selected ceiling areas stipulated in the scope of work (see attached floor plans in Appendix I.

### **Phase I- Pre-abatement cleaning phase**

A pre-abatement clean-up by means of HEPA vacuums/wet wiping, prior to installation of the primary barrier, will be performed by the Abatement Contractor. Pre-abatement cleaning activities can be handled as OSHA's Class III activities. All personnel conducting this phase must have DRNA certified workers/supervisors' IDs.

All debris/dust on the floors/furniture or any other horizontal/vertical surfaces is to be handled as ACM and must be cleaned, packed and disposed as such. Clean with HEPA vacuum all electrical and mechanical items, such as lighting fixtures, clocks, diffusers, registers, etc., which cover any part of the surface to be worked on during the project. Carpets are to be cleaned with HEPA vacuums and covered with appropriate number of polyethylene layers.

Completion of Phase I clean-up is defined as passing visual examination in accordance to standard ASTM 1368-14.

### **Phase II- Abatement of asbestos containing spray on ceiling.**

The task shall be performed entirely by the abatement contractor using DRNA trained/certified personal, using procedures described in this spec. Abatement activities shall be handled as OSHA's Class I activities. Respiratory protection shall be started at PAPR level and closely monitored for compliance with OSHA 29CFR 1926.62 requirements.

Select removal process to in accordance to following criteria:

- a. Minimize contamination of work area with asbestos contaminated dust, or other asbestos contaminated debris.

- b. Strictly control the amount of water and solvents used, to avoid leaks to the floor(s) underneath (see section 1100, paragraph 3.05).

Phase II shall be executed in three steps, after completing the initial surface cleaning and preparation of the work area:

1. Prepare working areas inside the courtrooms, including walls and floors.
2. Wet scrape asbestos containing spray on ceiling from the damaged areas, bag waste and dispose as ACM.
3. Apply encapsulant on the removed area and paint the removed area with paint similar to the existing color. Protect wooden trim when applying paint.

Upon completion of Phase II, the enclosure areas and/or additional areas to be added later on, will be cleared using ASTM 1369-14 followed by PCM (NIOSH 7400) and TEM AHERA like methods that include non-aggressive sampling (see section 1140 for clearance sampling sequence). Visual work completion means no presence of deteriorated/damaged spray on ceiling in the room.

### **Phase III- Abatement of other areas.**

After completion of the Phase I and Phase II related activities above, additional areas (rooms) may be assigned for partial, or complete removal of the spray on ceiling and/or additional ACM. Upon completion of Phase III, areas will be cleared using PCM NIOSH 7400 and TEM AHERA like method (no aggressive sampling).

A site visit is mandatory. The contractor shall submit a signed declaration stating his acquaintance with the project and the scope of work. Any quantitative estimate must be confirmed by the contractor during the pre-bid site visit and quoted accordingly considering also the additional requirements related to pre-cleaning.

Evidence of pollution insurance (endorsed to include Judicial Center) must be submitted with the quote, as well as unitary prices, the latest in the format shown in section 1180.

All the properly packed ACM waste shall be temporarily stored in a waste storage area to be assigned prior to project initiation and disposed upon completion of ACM removal. ACM waste will be stored in trailers and/or covered dumpsters provided by the *abatement* contractor marked with appropriate signage as to comply with DOT, OSHA, EPA and DRNA requirements. Transportation and disposal of removed ACM are included in the scope of work of this contract and they are Contractor's responsibility. The removal method/process shall be approved by owner representative and must include wet removal. Dry methods are not allowed. Water pressure blasting at high flow rate, or grinding methods will not be allowed as well. Work must be done under negative pressure of at least -0.02.

## 1.02

### WORK SEQUENCE AND TIME FRAME

- A. Mobilize on site and commence operations when given written Notice-to-Proceed.
- B. Contractor shall complete work throughout the proposed sequence under the appropriate operating conditions. Deviation in sequence will not be allowed without prior approval of Owner's Representative.
- C. Time frame is dictated by owner needs and is the base of the owner's contract with the abatement contractor. Needed completion time is maximum 2 months, including days of collection of clearance samples for analyses by TEM/PCM.
- D. Work shall be conducted after working hours, or during the weekends.

## 1.03

### CONTRACTOR USE OF PREMISES

- A. Confine operations at each site to the areas permitted by:
  - 1. Law
  - 2. Ordinances
  - 3. Permits
  - 4. Contract Documents
  - 5. Owner
- B. Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage materials.
- C. Do not unreasonably encumber sites with materials or equipment. Confine stockpiling of materials and location of storage to the areas assigned. If additional storage is necessary, obtain and pay for storage off-site.
- D. Lock automotive-type vehicles, such as passenger cars, trucks, and other motorized construction equipment, when parked and unattended, as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or with the ignition key in place or accessible to unauthorized persons.
- E. Maintain existing building in a safe condition throughout the abatement. Repair damage caused by abatement/construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

- F. Keep interior areas free from the accumulation of waste, rubbish, or construction debris.
- G. Smoking or open fires will not be permitted within the building enclosure or on the premises.
- H. Use of existing toilets within building, by the Contractor and his personnel are not permitted. Contractor personnel shall have use of facilities provided by the Contractor.
- I. Do not load structure with weight that will endanger structure.
- J. Assume full responsibility for protection and safekeeping of products stored on premises.
- K. Move any stored products which interfere with operation of Owner or other Contractors.
- L. Obtain additional storage or work areas needed for operations.
- M. Limit use of site work and storage to the areas indicated by the Owner's Representative.
- N. Provide work area security as necessary to ensure no entry into the work area while this contract is in force. The Contractor is completely responsible for the security of all equipment, materials, furnishings, etc., within the work area.
- O. Contractor is responsible for repair or replacement of any damaged items, components, or equipment as a result of his work.
- P. Contractor shall be responsible for ending the project without requesting any change due to weather conditions, or a condition of the building, prior to, or during abatement activities.

END OF SECTION

# **SECTION 1010 - PROJECT COORDINATION**

## **1.0 PART 1 - GENERAL**

### **1.01 RELATED DOCUMENTS**

- A. Drawings apply to work of this section.
- B. Section 1040 Project Meetings.

### **1.02 PRE-CONSTRUCTION MEETING**

- A. Pre-Construction conference will be scheduled and conducted at the project site prior to the issuance to the Notice to Proceed.
- B. The Pre-Construction conference shall be attended by the Contractor's:
  - 1. (Office) Job Manager
  - 2. (Field) Job Superintendent
  - 3. Major subcontractors' representatives
  - 4. Major suppliers' representatives
  - 5. Others as desired
- C. The Pre-Construction conference is intended to be an opportunity for the Contractor to review administrative, procedural, and temporary facilities requirements of the Contract documents, and to ask questions concerning work.
- D. The Contractor shall attend a pre-construction meeting scheduled by the Owner Representative. At least 24 hours advance notice will be provided to all participants prior to convening the Pre-Construction Meeting. At this meeting, the Contractor shall present in detail the following, organized in a commercial three-ring binder (3 copies each):
  - 1. Plan for preparation of the Work Area and sequence of Special emphasis shall be given to development of a work plan addressing the preparation of the work area prior to abatement of the spray on ceiling.
  - 2. Description of protective clothing and approved respirators to be used.
  - 3. Delineation of responsibility of Work Area Isolation.



4. Explanation of decontamination sequence.
5. Detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination areas, and a detailed description of the methods to be employed to control pollution.
6. The plan must be approved by the Owner's Representative prior to commencement of work.
7. Submit documentation indicating that all employees have been instructed on the hazards of exposure to asbestos dust, on the use and fitting of respirators, on personnel protective equipment, on the use of showers, on entry and exit from the work areas, and on all aspects of work procedures and protective measures.
8. The Contractor shall provide assurances that danger signs will be posted in and around the work area in compliance with OSHA regulation 29 CFR 1910.134 and 1926.1101, and as required by other Federal and Commonwealth regulations.
9. No abatement may proceed until the Owner's Representative and Contractor have agreed on the details required on the above items.
10. Other items specified in the Contract documents.

#### 1.03 INSPECTION FOR PRE-EXISTING DAMAGE

Before beginning work in any area, the Owner's Representative and Contractor will make an inspection and list all pre-existing damage. The Contractor will NOT be liable for any damage as listed.

#### 1.04 OWNER RESPONSIBILITIES

The Owner shall remove any portable furnishings and materials from areas to be addressed by this project (which are not in the courtrooms) prior to the startup of the project.

#### 1.05 SUPERINTENDENT, FOREMAN AND CRAFTSMEN

The Contractor shall have a job superintendent available on the job site at all

times while work on this Contract is in progress. The superintendent shall be experienced in administration and supervision of asbestos abatement projects, including, work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Competent Person as required by OSHA in 29 CFR 1926.1101 for the Contractor and is the Contractor's representative responsible for compliance with all applicable Federal and Commonwealth regulations, particularly those relating to asbestos containing materials. The Competent Person must have completed a course at an DRNA approved Asbestos Training Center (or equivalent) for Contractors/Supervisors in Asbestos Abatement, must have a minimum of two years on-the-job experience in this field, and must meet any additional requirements set forth in 29 CFR 1926.1101 for a Competent Person.

In addition to the superintendent, the Contractor shall furnish one or more foremen who are familiar and experienced with asbestos abatement and its related work, safety procedures, and equipment. Proof of foremen's experience shall be available and on file at the job site.

It shall be required that the superintendent and/or one or more foremen be inside each work area at all times during the asbestos abatement work.

Workers performing the cleanup activities shall have an initial 32 hours asbestos training and be in the possession of an DRNA current license. All phases of the work shall be executed by skilled craftsmen experienced in each respective trade. Proof of such experience shall be submitted to the Owner's Representative prior to the commencement of work and shall be kept on file at the job site.

All supervisors, foremen, and workers shall be certified in accordance with training requirements established by EPA/DRNA.

#### 1.06 DUTIES OF PROJECT SUPERINTENDENT

The general duties of the Project Superintendent are:

- A. Coordinating the work of all subcontractors and material suppliers.
- B. Supervising the activities of every phase of work taking place on the project.
- C. Coordinating and supervising the work of the plumbing, heating and cooling, and electrical subcontractors.
- D. Establishing lines of authority and communication at the job site.
- E. Being present at the job site on a full-time basis.
- F. Assisting in obtaining building and special permits required for construction.

#### 1.07 DAILY LOG

A Daily Log shall be maintained in the immediate area of the Decontamination Unit. This log will document the date and time of, but not be limited to, the following items:

Meetings; purpose, attendees, brief discussion.

Visitations; authorized and unauthorized.

Personnel; by name, entering and leaving the work area.

Special or unusual events; i.e. breaching, equipment failures, accidents.

Air monitoring tests and test results.

Documentation of Contractor's completion of the following:

Inspection of Work Area prior to the start of clean up and daily thereafter.

Removal of any sheet plastic barriers.

Contractor's final inspections prior to any operation that will conceal the condition of asbestos containing materials.

Removal of waste materials from work area.

Decontamination of equipment (List Items).

Contractor's final inspection/final air/test analysis.

Provide two (2) copies of this log to Owner's Representative on a daily basis.

Submit copies of this log at final closeout of project as a project close out submittal.

#### 1.08 DOCUMENTS AT JOB SITE (To Be Kept in Contractor's Office)

A copy of DERN permit.

A copy of all pertinent regulations.

A list of emergency telephone numbers to include the Owner, Owner's Representative, Fire, Police, Emergency Squad, and the Local Hospital.

All supervisors and asbestos workers are required to have medical examinations as required by 29 CFR 1926.1101 and 29 CFR 1910.1200. A list of personnel and a copy of their medical reports shall be maintained.

All supervisors and asbestos workers original certificates and original update certificates.

#### 1.09 SECURITY

The Contractor and his project superintendent will be responsible for security of the work, decontamination and loading areas, admittance of Contractor personnel and equipment, and emergency and fire procedures. The Owner will cooperate in these matters.

The Contractor shall provide and post all required warning and caution signs immediately beyond the work area in accordance with OSHA regulations and will be responsible for keeping unauthorized persons out of these areas.

#### 1.10 REQUIREMENTS BEFORE STARTING WORK

Contractor shall submit evidence for compliance with section 1060 paragraph 1.04. Contractor shall set up a filtration system for screening the wastewater resulting from showering/washing activities, or make arrangements for containing and disposal of the wastewater. Contractor shall provide a backup generator to ensure continuous functionality of avoid loss of negative pressure in the work area.

Work Areas and decontamination enclosure systems and parts of the building required to remain in use are effectively segregated.

Tools, equipment, and material waste receptacles are on hand.

Arrangements have been made for building security.

All other preparatory steps have been taken and applicable notices posted and permits obtained.

Submittal of work schedule for project completion.

#### 1.11 SPECIAL REPORTS

- A. General: Except as otherwise indicated, submit special reports directly to Owner within one day of occurrence requiring special report, with copy to Owner's Representative and others affected by occurrence.

- B. Reporting Accidents: Prepare and submit reports of significant accidents, at site and anywhere else work is in progress. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personnel injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

#### 1.12 CONTINGENCY PLAN

- A. Contingency Plan: Prepare a contingency plan for emergencies including fire, accident, power failure, negative air system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in plan, specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.
- B. Posting of Contingency Plan: In clean room of Personnel Decontamination Unit, telephone numbers and locations of emergency services, including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company, etc.

#### 1.13 NOTIFICATIONS

Owner rep will notify EPA of the abatement 10 working days prior to start up.

Notify other entities at the job site of the nature of the abatement activities, location of asbestos containing materials, requirements relative to ACM set forth in these specifications and applicable regulations.

Notify emergency service agencies, including fire, ambulance, police, or any other agency which may service the abatement work site in case of an emergency,

Any individual at the job site may notify emergency service if necessary, without effect on the Contract or the Contract Sum.

#### 1.14 SUBMITTALS

Before the Start of Work: submit all the items listed in 1.02D and the following to the Owner's Representative for review. No work shall begin until these submittals are returned with the Owner's Representative's Action Stamp indicating that the submittal is returned for unrestricted use, or final-but-restricted use.

- A. Work Plan.
- B. Contingency plans for emergency actions, including, but not only, back up

emergency generator.

- C. Telephone numbers and location of emergency services.
- D. Notifications sent to other entities at the work site.
- E. Notifications sent to emergency service agencies to include:  
Ambulance, Hospital, Fire, Police
- F. Resume of general superintendent.
- G. Air emissions and waste disposal permits from DERN.

END OF SECTION

# **SECTION 1020 - REGULATORY REQUIREMENTS**

## **PART 1 - GENERAL**

### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of the Contract apply to work of this section.

### **1.02 SUMMARY**

This section sets forth governmental regulations and industry standards, which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.

### **1.03 CODES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only. This list is provided as a convenience to the Contractor and is not to be considered all inclusive of codes and regulations that may apply. The Contractor shall comply with all pertinent codes, standards, regulations, and laws.

#### **American Conference of Governmental Industrial Hygienists (ACGIH) Guidelines to the Selection of Chemical Protective Clothing, Volumes I and II.**

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices.

#### **American National Standards Institute (ANSI)**

ANSI A10.6 (1983) - Demolition Operations \_ Safety Requirements

ANSI Z9.2(1979) - Fundamentals Governing the Design and Operation of Local Exhaust Systems

ANSI Z88.2 (1980) - Practices for Respiratory Protection

#### **Code of Federal Regulations (CFR)**

29 CFR 1910 - Occupational Safety and Health Standards

29 CFR 1910.12 - Construction Work

29 CFR 1910.20 - Access to Employees Exposure and Medical Records

29 CFR 1910.134 - Respiratory Protection

29 CFR 1910.145 - Specifications for Accident Prevention Signs and Tags

29 CFR 1910.1025 - Occupational Exposure to Asbestos

29 CFR 1920.1200 -Hazard Communication

29 CFR 1926.1101 - Safety and Health Regulations for asbestos in Construction

40 CFR 241 - Guidelines for the Land of Solid Wastes

40 CFR 257 - Criteria for Classification of Solid Waste Disposal Facilities and Practices

40 CFR 261 - Identification and Listing of Hazardous Waste

**Environmental Quality Board-Regulation 422.**

**Federal Acquisition Regulations (FAR)**

FAR 52.236\_13 - Accident Prevention

**Federal Standards (FED STD)**

FED STD 313 (Rev C) Materials Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

**National Institute for Occupational Safety and Health (NIOSH)**

NIOSH 87\_108      Respirator Decision Logic

NIOSH, HE 20.7108    Manual of Analytical Methods

**Underwriters Laboratories, Inc. (UL)**

UL 586 (1977; R 1982) Test Performance of High Efficiency, Particulate, Air Filter Units

Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance of all applicable Federal and Virgin Island regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records



of personnel as required by the applicable Federal and Commonwealth regulations. The Contractor shall assume full responsibility for applicable licenses and operating rights for patented systems. The Contractor shall hold the Owner and Owner's Representative harmless for failure to comply with any applicable work, hauling, disposal safety, health or other regulation on the part of himself, his employees, or his subcontractors.

#### 1.04 STANDARDS

General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract documents, all applicable standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract documents, or as if published copies are bound within.

Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all standards pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and the persons occupying areas adjacent to the site. The Contractor shall hold the Owner and Owner's Representative harmless for failure to comply with any applicable standard on the part of himself, his employees, or his subcontractors.

##### **A. LOCAL AGENCIES**

Environmental Quality Board (DRNA)/DERN,  
PROSHO

##### **B. LICENSES**

Maintain current licenses as required by applicable Federal or Commonwealth jurisdictions for the removal, transporting, disposal or other regulated activity relative to the work of this contract.

**Posting and filing of Regulations:** Maintain two (2) copies of applicable Federal regulations above. Post one copy of each at the job site. Keep on file in contractor's office one copy of each.

## **SECTION 1030 - DEFINITIONS AND STANDARDS**

### **1.0 PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of Contract apply to work of this section.

#### **1.02 SUMMARY**

General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon. Certain terms used in contract documents are defined in this article. Definitions and explanations of this section are not necessarily either complete or exclusive, but are general for the work to the extent they are not stated more explicitly in another element of contract documents.

#### **1.03 DEFINITIONS**

General Requirements: The provisions or requirements of Division-1 Sections apply to entire work of contract and, where so indicated, to other elements which are included in this project.

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

Approved: Where used in conjunction with Owner's Representative response to submittal, requests, applications, inquiries, reports, and claims by Contractor, the meaning of the term "approved" will be held to limitations of the Owner's Supplementary Conditions. In no case will "approval" by Owner's Representative be interpreted as a release of Contractor from responsibilities to fulfill requirements of contract documents.

Regulation: The term "Regulations" includes laws, statutes, ordinances, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry which control performance of the Work, whether they are lawfully imposed by authorities having jurisdiction or not.

Project Site: The term "project site" is defined as the space available to Contractor for performance of the work, either exclusively or in conjunction with others performing other work as part of the project. The extent of the project site is shown on the drawings, and may or may not be identical with the description of land upon which the project is to be built.

Furnish: Except as otherwise defined in greater detail, the term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing protecting, cleaning, and similar operations, as applicable in each instance.

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

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

Testing Laboratory: The term "testing laboratory" is defined as an independent entity engaged to perform specific inspections or test of the work, and to report and (if required) interpret results of those inspections or tests.

Owner's Representative: All references to Architect or Engineer in the contract documents shall in all cases refer to the Owner's Representative. The Owner's Representative will represent the Owner during construction and until final payment is due. The Owner's Representative will advise and consult with the Owner. The Owner's instructions to the contractor shall be forwarded through the Owner's Representative.

General Superintendent: The Contractor's representative at the work site.

Install: The term "install" is used to describe operations at the project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations".

#### 1.04 DEFINITIONS RELATIVE TO ASBESTOS ABATEMENT

Abatement: Procedures to control or decrease exposure to asbestos. Includes replacement, removal, encapsulation, and enclosure.

Accredited or Accreditation (when referring to a person or laboratory): A person

or laboratory accredited in accordance with Section 206 of Title II of the Toxic Substances Control Act (TSCA).

Aerosol: A system consisting of particles, solid or liquid, suspended in air.

Air Lock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, consisting of two curtained doorways at least six feet apart.

Area Monitoring: Sampling of asbestos concentrations within the asbestos control area and inside the physical boundaries which is representative of the airborne asbestos dust which may reach the breathing zone of personnel potentially exposed to dust.

Authorized Visitor: The Owner, the Owner's Representative, testing lab personnel, the Architect/Engineer, or a representative of any Federal or Commonwealth regulatory, or any other agency having authority over the project.

Barrier: Any surface that seals off the work area to inhibit the movement of asbestos containing debris.

Breathing Zone: A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches.

Ceiling Concentrations: The concentration of an airborne substance that shall not be exceeded.

Certified Industrial Hygienist (C.I.H.): An industrial hygienist certified in Comprehensive Practice by the American Board of Industrial Hygiene.

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

Curtained Doorway: A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, constructed by placing three overlapping sheets of polyethylene (6 mil thick) over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge to the second or "middle" sheet along the opposite vertical side of the doorway. Secure the third sheet on the same vertical edge as the first sheet. Two curtained doorways spaced a minimum of six feet apart from an air lock.

Decontamination Enclosure System: A series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. Except where specified otherwise, the

decontamination enclosure system shall contain at least one air lock.

Demolition: The wrecking or taking out of any building component, system, finish, or assembly of a facility together with any related handling operations.

Encapsulant: A material that surrounds or embeds asbestos an adhesive matrix.

Equipment/Materials Decontamination Enclosure System: A decontamination enclosure system for materials and equipment, consisting of a designated area of the work area, including a washroom, a holding area, and an uncontaminated area.

Equipment Room: A contaminated area or room with air locks to adjacent Shower Room and to contaminated work area which is part of the worker decontamination enclosure system, with provision for storage of contaminated clothing and equipment.

Filter: A media component used in respirators to remove solid or liquid particles from the inspired air.

Fixed Object or Fixed Equipment: A unit of equipment or furniture in the work area which cannot be removed from the work area.

HEPA Filter: A High Efficiency Particulate Absolute (HEPA) filter, with a UL 586 filter system capable of collecting and retaining asbestos dust. A HEPA filter is capable of trapping and retaining 99.97% against 0.3-micron size particles.

HEPA Filter Vacuum Collection equipment (for vacuum cleaner): High Efficiency Particulate Air (Absolute) filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos dust. A HEPA filter is capable of trapping and retaining 99.97% against 0.3-micron size particles.

High Efficiency Filter: A filter which removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 microns.

Holding Area: A chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an air lock.

Moveable Object or Loose Equipment: a unit of equipment or furniture in the work area which can be removed from the work area.

Negative Pressure Respirator: A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.

Negative Pressure Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a negative pressure inside the work area and a constant air flow from adjacent areas into the work area and exhausting that air outside the work area.

Negative Pressure: Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).

Personal Monitoring: Sampling of asbestos concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.26. Samples shall be representative of the employees' work tasks.

Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration capable of maintaining a pressure differential with the inside of the Work Area at a lower pressure than any adjacent area and which cleans re-circulated air or generates a constant air flow from adjacent areas into the Work Area.

Protection Factor: The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

Respirator: A device designed to protect the wearer from the inhalation of harmful atmospheres.

Shower Room: A room with two air locks located between the Clean Room and the Equipment Room in the worker decontamination enclosure system, with hot and cold running water and suitably arranged for complete shower during decontamination.

Substantial Completion: The time when all work under this contract has been basically completed by the Contractor and the final clearance requirements have been met.

Time-Weighted Average (TWA): The average concentration of a contaminant in air during a specific time period.

Washroom: A room between the Work Area and the holding area in the equipment/materials decontamination enclosure system. The washroom comprises an air lock.

Work Area: The area where asbestos abatement operations are performed which is defined and/or isolated to prevent the spread of asbestos dust or debris, and

entry by unauthorized personnel. The Work Area is a Regulated Area as defined by 29 CFR 1926.

Worker Decontamination Enclosure System: A decontamination enclosure system for workers, consisting of three rooms and three air locks as follows: clean room, air lock, shower room, air lock, equipment room, air lock, which asbestos to the contaminated work area.

## 1.05 INDUSTRY STANDARDS

General Applicability of Standards: Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, applicable standards of the construction industry have the same force and effect (and are made a part of contract documents by reference) as if copied directly into contract documents, or as if published documents were bound herein. Refer to the other contract documents for resolution of overlapping and conflicting requirements which result from the application of several different industry standards to the same unit of work. Refer to individual unit of work sections for indications of which specialized codes and standards the Contractor must keep at the project site, available for reference.

Referenced Standards: (Referenced directly in contract documents or by governing regulations) have precedence over non-referenced standards which are recognized in industry for applicability to work.

Non-referenced Standards: These are hereby defined to have no particular applicability to the work, except as general requirements of whether the work complies with standards recognized in the construction industry.

Publication Dates: Except as otherwise indicated, where compliance with an industry standard is required, comply with the standard in effect as of the date of the contract documents.

Updated Standards: At the request of the Owner's Representative, submit a change order proposal where an applicable industry code or standard has been revised and reissued after the date of the contract documents and before the performance of the work standard.

Copies of Standards: The contract documents require that each entity performing work be experienced in that part of the work being performed. Each entity is also required to be familiar with recognized industry standards applicable to that part of the work. Copies of applicable standards are not bound with the contract documents.

Where copies of standards are needed for proper performance of the work, the Contractor is required to obtain such copies directly from the publication source.

Although certain copies of standards needed for enforcement of the requirements may be required submittal, the Owner's Representative reserves the right to require the Contractor to submit additional copies of these standards as necessary for enforcement of the requirements.

Abbreviations and Names: The following acronyms or abbreviations are used but not identified in specifications or other contract documents; they are defined to mean the industry recognized name of a trade association, standards generating organizations, governing authority or other entity applicable to the context of the text provision, refer to "Encyclopedia of Associations," published by Gale Research Co., available in large libraries.

Abbreviations and Names: The following acronyms or abbreviations as referenced in contract documents are defined to mean the associated names. Both names and addresses are subject to change, and are believed to be, but not assured to be, accurate and up-to-date as of the date of the contract documents:

ANSI	American National Standards Institute 1430 Broadway, New York, NY 10018 212/354-3300
ASHRAE	American Society for Heating, Refrigerating, and Air Conditioning Engineers 1791 Tullie Circle NE Atlanta, GA 30329
ASTM	American Society for Testing and Materials 1916 Race Street, Philadelphia, PA 19103 215/299-5400
CFR	Code of Federal Regulations Available from Government Printing Office Washington, DC 20402 (usually first published in Federal Register)
CS	Commercial Standard of NBS (U.S. Dept. of Commerce) Government Printing Office: Washington, DC 20402
EPA	Environmental Protection Agency 401 M Street SW, Washington, DC 20460 202/382-3949
FS	Federal Specifications (General Services Administration) Obtain from your regional GSA office; or purchase from GSA Specifications Unit (WFSIS)



7th and D Street, SW  
Washington, DC 20406  
202/472-2205 or 2140

GSA            General Services Administration  
F Street and 18th Street NW  
Washington, DC 20405  
202/655-4400

MIL            Military Standardization Documents  
(U.S. Department of Commerce)  
Gaithersburg, MD 20234  
301/921-1000

NBS            National Bureau of Standards  
(U.S. Department of Commerce)  
Gaithersburg, MD 20234  
301/921-1000

NEC            National Electric Code (by NFPA)

NFPA           National Fire Protection Association  
Batterymarch Park, Quincy, MA 02269  
617/770-3000

OSHA Occupational Safety & Health Administration  
(U.S. Department of Labor)  
Government Printing Office; Washington, DC 20402

PS            Product Standard of NBS  
(U.S. Department of Commerce)  
Government Printing Office; Washington, DC 20402

UL            Underwriters Laboratories  
333 Pfingsten Road; Northbrook, IL 60062  
312/272-8800

Trade Union Jurisdictions: It is a procedural requirement that the Contractor maintain, and require prime subcontractors to maintain, complete current information on jurisdictional matters, regulations, actions and pending actions, as applicable to the work. Discuss new information of relevance along with the action agreed upon. The manner in which contract documents have been organized and subdivided is not intended to be an indication of jurisdictional or trade union agreements. Assign and subcontract the work, and employ tradesmen and laborers, in a manner which will not unduly risk jurisdictional disputes of a kind which could result in conflicts, delays, claims, and losses in the performance of the work.

## 1.06 SUBMITTALS

Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

END OF SECTION

## **SECTION 1040 - PROJECT MEETINGS**

### **1.0 PART 1 - GENERAL**

#### **1.01 SCHEDULING AND ATTENDANCE**

- A. The Owner's Representative, in cooperation with the Owner and the Contractor, will schedule and administer the Pre-Construction Conference, periodic progress meetings, and other specially called or required meetings.
- B. Representatives of the Owner will attend.
- C. Representatives of the Contractor, subcontractors and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- D. Work related to removal of ACM stipulated in scope of work will be performed and completed during after working hours, from 5 p.m. to 5 a.m.

#### **1.02 PROGRESS MEETINGS**

- A. Progress Meetings will be scheduled and conducted at the project site prior to the Contractor's submittal of an application for payment, or when deemed advisable by the Owner's Representative.
- B. Progress Meetings shall be attended by the Contractor's:
  - 1) (Office) Job Manager
  - 2) (Field) Job Superintendent
  - 3) Subcontractors' representatives, as befits the agenda.
  - 4) Suppliers' representatives, as befits the agenda.
  - 5) Others as appropriate.
- C. Progress Meetings are intended to be a biweekly opportunity for the Contractor to review and submit applications for payment, and attachments, and for a general review of the progress of the work, aimed at identifying and mitigating impediments to timely completion.

**END OF SECTION**

## **SECTION 1050 - PROGRESS SCHEDULES**

### **1.0 PART 1 - GENERAL**

Initial and final submittals schedule are to be coordinated directly with the owner.

#### **1.01 SUBMITTALS SCHEDULE**

- A. Submit with the initial Progress Schedule. Clearly identify the Project, and format in manner similar to the initial progress schedule, utilizing the same method, or make a part of the initial Progress Schedule.
- B. Identify submittals to be made. Show date for submission and date by which Designer should respond, allowing sufficient time for review.
- C. Designer may require revision of schedule if times allotted for review are insufficient.

#### **1.02 UPDATED PROGRESS SCHEDULE**

- A. Submit three (3) copies with each application for payment.
- B. Clearly identify the Project and the phases. Format in a manner similar to the initial progress schedule, utilizing the same method.
- C. Indicate:
  - 1) Work as initially scheduled.
  - 2) Actual progress through the period covered by the current application for payment.
  - 3) Planned progress through Substantial Completion, including extensions of the time made by change order or construction change directive.
- D. If actual progress falls behind projections, show how the backlog is to be made up so that the work will be completed on time.

END OF SECTION

## **SECTION 1060 - SUBMITTALS**

### **1.0 PART 1 - GENERAL**

#### **1.01 DESCRIPTION**

Make submittals required by the Contract documents in a timely manner and at approximate times in the execution of the Work to allow for sufficient and prompt review by Owner's Representative. Revise and resubmit as necessary to establish compliance with the specified requirements.

#### **1.02 WORK INCLUDED**

- A. Submit complete, bound sets of the submittals required in the Contract Documents. Submit separate sets entitled, "Pre-Job Submittals" and "Post-Job Submittals."
- B. Update submittals to Owner's Representative on a weekly basis to account for all new equipment and employees used on the project.
- C. Submit three complete sets of "Pre-Job Submittals" to the Owner's Representative for review at the Pre-Construction Meeting. The Work may not proceed until the complete "pre-job submittals" to the Owner's Representative for review, following the final completion of the Work. Requests for final payment will not be approved until the Post-Job Submittal package has been reviewed and approved by the Owner's Representative.
- D. Submit three complete sets of "Post-Job Submittals" to the Owner's Representative for review, following the final completion of the Work. Requests for final payment will not be approved until the Post-Job Submittal package has been reviewed and approved until the Post-Job Submittal package has been reviewed and approved by Owner's Representative.
- E. Identify individual submittals by name and include a table of contents in each submittal package.

#### **1.03 QUALITY ASSURANCE**

- A. Carefully review and coordinate all aspects of each item being submitted.
- B. Verify that each item and its appropriate submittal conform in all respects with the specified requirements.
- C. Certify, by affixing signature of Contractor's authorized representative to the corner of each submittal package, that this coordination has taken

place.

#### 1.04 PRE-JOB SUBMITTALS

- A. Manufacturer's specifications for fire retardant reinforced polyethylene to be used, 20-40 mil rubber membrane (or equivalent), air cleaning, HEPA vacuum equipment, and air handling equipment, as well as any special tools or safety equipment to be utilized on this Project.
- B. Identify the storage site on the premises, which is proposed for use in disposing of the ACM.
- C. Proof of arrangement for transportation of asbestos containing materials (ACM) and disposal in an industrial landfill in Puerto Rico.
- D. Submit a specific Work Plan including specific plan for preparation of work area, description of protective equipment, delineation of work area isolation, explanation of decontamination sequence, description of abatement methods, description of materials to be used, working schedule. This work plan must be approved by owner and owner representative prior to initiation of abatement activities.
- E. Accident Prevention Plan
- F. Written description, sketch, or combination thereof, of the plans for construction of a worker and equipment decontamination enclosure system and for isolation of the work areas in compliance with Contract Documents.
- G. Written description and sketch of the security plan to be utilized.
- H. Clean up procedures, or practices to be utilized on the Project.
- I. Specimen copy of asbestos abatement worker Sign In/Sign Out Log form to be used.
- J. Certificates of supervisor of abatement operations.
- K. List of asbestos abatement supervisor personnel (including foremen) and their experience, qualifications, and training.
- L. License (carnet) of each and every asbestos abatement worker to be utilized on the Project and certification by the Contractor that the worker is actively involved in an employee medical surveillance program. Include copies of each employee's medical examination records.

- M. Individually signed forms by each and every asbestos abatement worker to be utilized on the Project by the Contractor documenting that each is actively involved in a company employee respirator protection program and has had appropriate training in respiratory protection.
- N. Any special equipment, techniques to be used on the Project.
- O. Listing of asbestos removal workers to be utilized on the Project.

#### 1.05 POST-JOB SUBMITTALS

- A. Affidavit of Release of Liens and consent of Surety to Final Payment.
- B. Waste log showing date, type of container removed from work area, if any, signature of recorder, time of day, and a sketch or written description of the location of the waste material in the landfill, as well as disposal manifest.
- C. Copy of the Entry/Exit Log showing the following: date, name, social security number, entering and leaving time, company or agency represented, and reason for entry for all persons entering the work areas.
- D. An alphabetical listing of each employee used on the project and exact dates on which employees were present in the asbestos abatement work areas.
- E. Medical exams, worker release forms, asbestos abatement training certification forms, and respirator training documentation of all new employees performing asbestos abatement on the Project.
- F. List extra materials stock.
- G. Results of final clearance.
- H. DRNA permit closure documents (closure will be executed by AESI).

#### 1.06 IDENTIFICATION OF SUBMITTALS

- A. Number consecutively and clearly identify all submittals. Show identification on at least the first page of each submittal, and elsewhere as necessary for positive identification of the submittal.
- B. Accompany each submittal package with a letter of transmittal showing all information required for identification and checking.

#### 1.07 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates of commencement, execution, or installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.
- B. Accept responsibility for delays resulting from incomplete submittal packages.

#### 1.08 OWNER'S REP REVIEW

- A. Partial submittals may be rejected for non-compliance with the Contract Documents.
- B. Review by Owner's Representative does not relieve Contractor from responsibility for errors which may exist in the submitted data.
- C. Make revisions when required by Owner's Representative and resubmit for review.

END OF SECTION



## **SECTION 1070 - ADMINISTRATIVE LOGS**

### **1.0 PART 1 - GENERAL**

#### **1.01 SUBMITTALS LOG**

- A. If shop drawings, product data or sample submittals are required by the Contract Documents, maintain a submittals log to record the status of submittals made to the Designer.

1. Clearly identify the project.
2. Record activities with respect to shop drawings, product data, samples, and other such submittals as desired.
3. Indicate for each submittal made to date:
  - a. Title or name and type of submittal
  - b. Date submitted to the Owner's Representative.
  - c. Date returned by the Owner's Representative.
  - d. General nature of the Owner's Representative response.

Submit three (3) copies with each application for payment.

#### **1.02 VISITOR (SIGN-IN) LOG**

- A. Maintain Sign In/Out Log in the field office (or with the project Superintendents when no field office is required) to record entry and exit of persons entering work areas. Allow no one to enter or exit work areas without making record log in.

1. Clearly identify the Project.
2. Indicate:
  - a. Visitor name and social security number.
  - b. Date of visit.
  - c. Time of arrival and departure.
  - d. Company or agency represented and reason for presence.

- B. Submit three (3) copies with each application for payment.

#### **1.03 WASTE LOG**

- A. Maintain notarized waste log showing date, type of container removed from work area, signature of recorder, and time of day.

END OF SECTION

## SECTION 1080 - TEST LABORATORY SERVICES

### 1.0 PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Scope: Owner's Laboratory will provide area and final clearance monitoring. Contractor shall cooperate with owner's laboratory to facilitate execution of its required services.
- B. Qualification of Laboratories
  - 1. Laboratory must meet "Recommended Requirements for Independent Laboratory Qualifications" published by the American Council of Independent Laboratories and must be accredited by AIHA.
  - 2. Laboratory personnel shall have been trained in accordance with quantitative asbestos analysis by PCM methods and judged proficient by successful participation in NIOSH Proficiency Analytical Testing (PAT) program.
  - 3. Proficient participation in NIOSH PAT is defined as being directly involved in submission of samples to NIOSH/ AIHA, or included in quality control program for Proficient laboratory.
  - 4. Submit copy of report on result of most recent PAT participation, with memorandum of any deficiencies reported from participation.
  - 5. Perform all testing under the direction of a registered Professional Engineer, Certified Industrial Hygienist or a Ph.D. employed full time by the testing laboratory.
- C. Limitations of Authority of Testing Laboratory.
  - 1. Laboratory is not authorized to:
    - a. Release, revoke, alter or enlarge on requirements of Contract Documents.
    - b. Approve or accept any portion of work.
    - c. Perform any duties of contractor.
- D. Selection of Laboratory
  - 1. Owner's Representative Duties: AES International will perform both area and personal monitoring.

## 1.02 LABORATORY DUTIES

### A. Testing Laboratory

1. Owner laboratory will sample/monitor/test air for OSHA/DNRA compliance. Contractor will be advised any time questions arise as to compliance with standards of quality and completeness of work, and he shall use his best efforts to resolve such questions.
2. Services provided:
  - a. Conduct sampling as directed by Owner's Representative and/or specified.
  - c. Provide personal air monitoring pumps to collect samples of airborne asbestos dust.
  - c. Calibrate air monitoring pumps before each sampling cycle and submit record of each calibration to engineer.
  - d. Monitor results and complete analysis within 24 hours after each test.
  - e. Submit three (3) copies of all monitoring results in writing, with description of work procedure at time of air monitoring within three (3) working days after field sampling.
  - f. All testing results shall be reviewed by a register Professional Engineer, Certified Industrial Hygienist or a Ph.D. employed full time by the testing laboratory.
  - g. Notify Owner's Representative and Contractor immediately of any exposures to asbestos dust in excess of acceptable and/or specified limits.
6. Monitoring Provided (A minimum of 6 air samples during the day shall be collected):
  - a. Prior to asbestos abatement work: Owner's laboratory shall provide area monitoring to establish reference for existing ambient air, or concentration of fibers following pre-abatement clean-up. Sampling shall be performed one day prior to Contractor's preparation operations for each cleaning area.

- b. During abatement work: Owner's laboratory shall take air samples inside the work area in each of the 8-hour shifts. Contractor's personal samples shall be by AESI to ensure compliance with 29 CFR 1926.1101 and DENR permit requirements. At least two (2) PCM samples/per court room inside the work area and six (6) PCM from outside work area shall be collected daily as well as 2 field blanks (for the batch).
- c. Monitoring: Owner's laboratory shall take air samples after barrier (outside work area) between work area and non-work area, plus one (2) at each local air exhaust, one (2) outside decontamination waste holding room exit and one (2) outside clean room entry.
- d. Monitoring after abatement (Owner's laboratory):
  - (1) Where applicable, provide area monitoring of asbestos fibers of less than or equal to 0.005 f/cc achieved after final clean-up, but before Contractor removes control area enclosure. Analysis shall be conducted utilizing PCM NIOSH 7400 technique, or equivalent acceptable by DRNA/EPA. Additional TEM clearance samples shall be also collected by the owner representative for each work area cleared. Analysis of TEM samples shall be conducted using modified, non-aggressive AHERA protocol and AHERA clearance limits (70 s/mm<sup>2</sup>).
  - (2) Should any of final clearance samples indicate higher values than specified herein, Owner's Representative will advise Contractor to take appropriate actions to reclean area while monitoring is also repeated.
  - (3) Contractor will be responsible for all costs for retesting and analysis in the event the standard of final clearance is not achieved.
  - (4) All final PCM clearance sampling results shall be reported to Contractor within 24 hours from the time the samples were collected. All final TEM clearance samples results shall be reported within 24 to 72 hours, if worked completed on the weekend.

B. Contractor Required Notification

- 1. Where required test or inspections are specified, Contractor shall give notice to Owner's Representative 48 hours in advance, stating

date and time when project will be ready for test or inspections to be made.

2. Owner's Representative will make every reasonable effort to accommodate Contractor's request for date and time of proposed inspection, In the event of circumstances beyond his control, Contractor is not permitted to proceed until coordinate time of inspection is scheduled and inspection is accomplished.
3. In event Contractor is not ready for test (false start) at agreed upon time, all expense of Owner's Representative round trip time shall be applied against Contract Sum by credit adjustment to Owner.

END OF SECTION

## **SECTION 1090 - NEGATIVE PRESSURE SYSTEMS**

### **1.0 PART 1 - GENERAL**

Drawings and general provisions of the contract apply to work of this section.

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of the contract apply to work of this section

#### **1.02 SUBMITTALS**

- A. The contractor shall assure the owner that it has obtained, or will obtain prior to the commencement of the work under this contract all the licenses necessary to use patented designs, materials, products, processes, equipment or services in the performance of this contract, and it shall pay for all royalties and license fees associated with such patents.
- B. Before start of the work: Submit design of negative air system to the owner's representative for review. Do not begin work until submittal is returned with the owner representative action stamp indicating that the submittal is returned for unrestricted use. Include in the submittal at a minimum:
  - Number of negative air machines required and the calculations necessary to determine the number of the machines.
  - Description of projected air flow within work area and methods required to provide adequate air flow in all portion of the work area.
  - Pressure differential across work area enclosure anticipated. Pressure differential must not fall below -0.02 inches of water.
  - Description of the testing methods for the correct air flow and pressure differential
  - The Contractor must use continuous monitoring devices (e.g. manometer, see section 1.03).
  - Manufacturer's product data on the machines to be used. Location of the machines in the work space.
  - Method of supplying adequate power to the machines and designation of building electrical panels which will be supplying the power. Description of work

practices to ensure that airborne particles travel downstream from the workers.

- Manufacturer's product data on equipment used to monitor pressure differential inside and outside the work area.

### 1.03 QUALITY ASSURANCE

Monitor pressure differential across Decontamination Unit with a differential pressure method equipped with a strip chart recorder, or equivalent to keep/print data. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops below 0.02" of water. The Contractor must use continuous monitoring devices.

Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of work area.

END OF SECTION



## **SECTION 1100 - TEMPORARY ENCLOSURES**

### **1.0 PART I - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawing and general provisions of Contract apply to work of this section.

#### **1.02 SUBMITTALS**

Before Start of Work Submit the following to the Owner's Representative for review. Do not begin work until these submittals are returned with the Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use.

SPRAY CEMENT: Submit the following:

-Product description including major components and solvents.

-Manufacturer's installation instructions. Indicate portions applicable to the project.

-Safety Data Sheet: Submit the Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for spray cement material proposed for use on the work. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

-SHEET PLASTIC: For fire retardant plastic submit test reports on NFPA 701 test.

-SIGNS: Submit samples of signs to be used.

### **2.0 PART 2 - PRODUCTS**

#### **2.01 SHEET PLASTIC:**

Polyethylene Sheet: Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for flame-retardant Textiles and Films. Provide largest size possible to minimize seams, 4.0 or 6.0 mils thick, frosted or black be used in areas where there could be existing difficulties in case of emergency or there is not equipment or a potential for fire.

Reinforced Polyethylene Sheet: For the floor layers provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 4.0 or 6.0 mil thick as indicated, frosted.

## 2.02 MISCELLANEOUS MATERIALS:

Duct Tape: Provide duct tape in 2" or 3" widths, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

## 3.0 PART 3 - EXECUTION

### 3.01 GENERAL:

Work Area: The location where pre-abatement/abatement activities will occur. It is a variable of the extent of work of the Contract. It may be a portion of a room, a single room, or a complex of rooms. A "Work Area" is considered contaminated during the work, and must be isolated from the building, and decontaminated at the completion of the asbestos control work.

Completely isolate the Work Area from other parts of the building, as to prevent asbestos containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas. Perform all such required cleaning or decontamination at no additional cost to Owner.

### 3.02 SIGNS

Post an approximate 20 inch by 14-inch manufactured caution sign, at each entry to the work area (minimum of 2 signs will be posted), displaying the following legend (English and Spanish) in accordance to 29 CFR 1910.145, paragraph (d) (4), vertical format, minimum 20 by 14 inches; spacing between two consecutive lines shall be at least equal to the height of the upper line.

#### Legend Notation

Danger 1-inch Sans Serif Gothic or Block

Asbestos 1-inch Sans Serif Gothic or Block

May Cause Cancer

Causes Damage to Lungs 1/4 inch Sans Serif Gothic or Block

Authorized Personnel Only 1/4-inch Gothic

Respirators and Protective Clothing

Required in this Area - 1/4-inch Gothic

## OSHA NEW ASBESTOS SIGN



Display the following legend in the lower panel:

## Communication of Hazards Signs

Letreros de precaución deben ser utilizados para demarcar el área regulada

Términos adicionales donde se aplique:

RESPIRADORES Y ROPA  
PROTECTIVA ES REQUERIDA EN  
ESTA AREA



### 3.03 CRITICAL BARRIERS:

Completely separate the Work Area from other portions of the building, and the outside by closing all openings with sheet plastic barriers at least 6 mils in thickness, or by sealing cracks asbestos out of Work Area with duct tape. Special attention shall be given to the areas of the HVAC registers.

Fabricate partitions from 2X4 wood studs with 1/2" plywood on both faces. Brace at 4'-0" on center.

Clean housings and ducts of all overspray materials prior to erections of any critical barrier that will restrict access.

Locked Access: Arrange Work Area so that the only access into Work Area is through lockable doors to personnel and equipment decontamination units.

Visual Barrier: Where the Work Area is immediately adjacent to or within view of traffic areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mils in thickness so that the work procedures are not visible to building occupants/visitors.

Provide Warning signs (two languages) at each locked door to Work Area reading as follows:

<u>Legend</u>	<u>Notation</u>
CAUTION	2" Sans Serif Gothic or Block
ASBESTOS HAZARD	2" Sans Serif Gothic or Block
KEEP OUT	2" Sans Serif Gothic or Block

### 3.04 PREPARE AREA:

Scaffolding: If fixed scaffolding is being used to provide access HEPA vacuum and wet clean area prior to scaffolding installation.

Remove all electrical and mechanical items, such as lighting fixtures, clocks, diffusers, registers, etc., which cover any part of the surface to be worked on during the project. All lighting fixtures are to be cleaned, packed and stored in the hallway (see Phase I).

Clean all surfaces in Work Area with HEPA filtered vacuum or by wet wiping prior to the installation of primary barrier (see Phase I requirements).

### 3.05 PRIMARY BARRIER:

Protect building and other surfaces in the Work Area from damage from water and high humidity of from contamination from asbestos containing debris with a primary barrier as

described below.

Sheet Plastic: Protect surfaces in the Work Area with two (2) layers of plastic sheeting on floor and two (2) on walls, or as otherwise as stipulated in the specific work plan to be submitted by the contractor prior to beginning of abatement activities.

Perform work in the suggested sequence below. The sequence can be modified during contractor's submittal for approval of a specific work plan.

In areas where scaffolding is to be used (where no hard floor is present) cover floor with a single layer of 1/2" CDX plywood, Masonite or 1/4" tempered hardboard. Wrap edges and corners of each sheet with duct tape. At completion of abatement move to next Work Area or dispose of as an asbestos contaminated waste material. Cover plywood/tempered hardboard and/or hard floor with 1 layer of Ram Board 46 mil and two (2) individual layers of clear polyethylene sheeting, each at least 6 mils in thickness, turned up walls at least 12" (first layer) and 18" (second layer). Form a sharp right-angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.

Judge benches, or any other fixed items that cannot be removed, must be covered with appropriate materials/scaffolds and least three protective poly layers on top to ensure no water damage/leaks will occur.

Cover all walls in Work Area including "Critical Barrier" sheet plastic barriers with two layers of polyethylene sheeting, at least 6 mils in thickness, mechanically supported and sealed with duct tape or spray-glue in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated on the Contract documents or in writing by the Owner's Representative.

Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4" exterior grade plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials.

Repair of Damaged Polyethylene Sheeting: Remove and replace plastic sheeting which has been damaged by removal operations or where seal has failed allowing water to seep between layers. Remove affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry.

### 3.06 STOP WORK

If the critical or primary barrier falls or is breached in any manner stop work immediately. Do not resume work until authorized in writing by AESI.

END OF SECTION

## SECTION 1110 - WORKER PROTECTION

### 1.0 PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

Drawings and general provision of the Contract apply to work of this section.

#### 1.02 DESCRIPTION OF WORK:

This section describes the equipment and procedures required for protecting workers against asbestos contamination and other work place hazards except for respiratory protection.

#### 1.03 RELATED WORK SPECIFIED ELSEWHERE:

Respiratory Protection: is specified in Section 1120.

#### 1.04 WORKER TRAINING:

A. Train, in accordance with 29 CFR 1926.1101, all workers in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. Include, but do not limit the topics covered in the course to the followings:

- Methods of recognizing asbestos.
- Health effect associated with asbestos.
- Nature of operations that could result in exposure to asbestos.
- Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including;
  - Engineering controls
  - Work practices
  - Respirators
  - Housekeeping procedures
  - Hygiene facilities
  - Protective clothing
  - Decontamination procedures
  - Emergency Procedures
  - Waste Disposal Procedures
- Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1926.1101.
- Appropriate work practices for the work
- Requirements of medical surveillance program
- Review of 29 CFR 1926.1101
- Review of regulation 422 (Puerto Rico)

- Negative air systems
- Work practices including hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area.

#### 1.05 MEDICAL EXAMINATIONS:

- A. Provide medical examinations for all workers who may encounter asbestos-contaminated dust. Examinations shall, at a minimum, meet requirements as set forth in 29 CFR 1926.1101 and 29 CFR 1910.1200. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

#### 1.06 SUBMITTALS:

- A. Before Start of Work: Submit the following to the Owner's Representative for review. Do not start work until these submittals are returned for unrestricted use.

Certificate worker Acknowledgment: Submit an original signed copy of the Certificate of Worker's acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the work area.

Training Program: Submit a course outline of the worker training course. Include date and time course was given, name and title of teacher, attendance sheet listing all attendees of the course. Submittal shall be in the form of a letter signed and dated the course teacher.

Report, from Medical Examination: Conducted within last 12 months as part of compliance with OSHA medical surveillance requirements for each worker who is to enter the work areas. Submit, at minimum, for each worker the following:

Name and Social Security Number

Physicians Written Opinion from examining physician including at a minimum the following:

Whether worker has detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.

Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.

Statement that the worker has been informed by the physician of the

results of the medical examination and of any medical conditions that may result from asbestos exposure.

Statement that worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat stress in the worker.

Notarized Certifications: Submit certification signed by an officer of the abatement contracting and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.1101.

#### 1.07 PROTECTIVE CLOTHING:

- A. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the work area. Provide a sufficient number for all required changes, for all workers in the work area.
- B. Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protectors for all workers. Provide boots at no cost to workers. Do not allow boots to be removed from the work area for any reason, after being contaminated with asbestos based paint.
- C. Hard Hats: Provide head protectors (hard hats) as required by OSHA for all workers, and provide four (4) spares for use by Owner's Representative, Owner. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the work area throughout the work. Thoroughly clean, decontaminate and hard hats before removing them from work area at the end of the work.
- D. Goggles: Provide eye protectors (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury.
- E. Gloves: Provide work gloves to all workers and require that they will be worn at all times in the work area. Do not remove gloves from work area and dispose of as asbestos contaminated waste at the end of the work.

#### 1.08 ADDITIONAL PROTECTIVE EQUIPMENT:

Respirators, disposable coveralls, head cover, and footwear covers shall be provided by the contractor for the Owner, Owner's Representative and other authorized representatives who may inspect the job site, providing that medical documentation and



certification are presented.

#### 1.09 GENERAL:

Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. The following procedures are minimums to be adhered to regardless of fiber count in the work area.

Each time work area is entered remove all street clothes in the Changing Room of the Personnel Decontamination Unit and put on new disposable coverall, new head cover, and a clean respirator. Any additional clothing and equipment shall be left in Equipment Room. Workers shall provide themselves with additional warm garments. These must be treated as contaminated clothing and left in the Equipment Room and disposed of at the end of the project. Proceed through Shower Room to Equipment Room and put on work boots.

#### 1.10 DECONTAMINATION PROCEDURES:

- A. Require all workers to adhere to the following personnel decontamination procedures whenever that leave the work area:

Before leaving the work area, the worker shall remove all gross contamination and debris from the coveralls. This is to be accomplished by one worker assisting another in brushing each other off or vacuuming with HEPA filter equipment vacuums approved for asbestos clean-up.

The worker then proceeds to Equipment Room and removes all clothing except respirator protection equipment. Contaminated extra clothing may be placed in a bag for disposal with other material. The worker then proceeds immediately into Shower Room. Respiratory protection equipment shall be removed after worker had completely showered to prevent inhalation of dust and/or vapors.

- B. Type C Supplied Air (if used): Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the work area:

When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the Equipment Room. Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator and filters while showering. The following procedure is required at a minimum.

Thoroughly wet body including hair and face.

Take a deep breath, hold it and/or exhale slowly, completely wet hair, face, and

respirator. While still holding breath, remove respirator and hold it away from face before starting to breathe.

Carefully wash face piece of respirator inside and out.

Shower completely with soap and water.

Rinse thoroughly.

Rinse shower room walls and floor prior to exit.

Proceed from shower to Changing Room and change into street clothes or into new disposable work items.

- C. Air Purifying-Negative Pressure Respirators: Require that all workers use the following decontamination procedure, as a minimum requirement, whenever leaving the work area with a PAPR, half or full-face cartridge respirator:

When exiting area, remove disposable coveralls, disposable head covers, and disposable footwear covers or boots in the Equipment Room.

Still wearing respirators, proceed to showers. Showering is mandatory. Care must be taken to follow reasonable procedures in removing the respirator and filters while showering. The following procedure is required as a minimum.

- Thoroughly wet body from neck down. Wet hair as thoroughly as possible without wetting the respirator filter if using an air purifying type respirator.
- Take a deep breath, hold it and/or exhale slowly, complete wetting of hair thoroughly wetting face, respirator and filter (air purifying respirator).
- While still holding breath, remove respirator and hold it away from face before starting to breathe.
- Dispose of wet filters from air purifying respirator.
- Carefully dispose of wet filters from air purifying respirator.
- Carefully wash face piece of respirator inside and out.
- Shower completely with soap and water.
- Rinse shower room walls and floor prior to exit.
- Proceed from shower to Changing Room and change into street clothes or into new disposable work items.
- When exiting mini-containment, workers shall strip down to clean Tyvek suit prior to exiting the work area.

## 1.11 AIR MONITORING – PERSONAL SAMPLES

AES International, an AIHA accredited lab and current proficient participant in the NIOSH PAT Program will perform the sampling. Continuous monitoring and inspection will include work area samples, personnel samples from the breathing zone of

the worker to accurately determine the employee's 8-hour TWA for all job tasks. At least 25% of the working force shall be sampled.

Sampling and analysis methods shall be done using NIOSH 7400 method protocol for PCM testing, or any other methods acceptable by EPA. Air sample results shall be reported verbally to the Owner's Representative/Contractor within 48 hours, with written results delivered to the job site and posted within 72 hours.

Air monitoring shall be conducted on a daily basis after establishing the employee's 8-hour TWA shall include, but not be limited to the following:

<u>Inside Work Area</u> <u>(liters)</u>	<u>Min. Volume</u> <u>(liters)</u>	<u>Max. Volume</u>
Personal Samples (2)	200	1,200
Area Samples (3)	200	3,000

Continuous air monitoring is not required during activities using supplied air (Type C) respiratory protection.

#### 1.12 WITHIN WORK AREA

Require that workers NOT eat, drink, smoke, and chew gum or tobacco in the work area. To eat, chew, drink or smoke, workers shall follow the procedure described above, then dress in street clothes before entering the non-work area of the building.

Work footwear shall remain inside the Work Area (Equipment Room) until completion of the project then disposed of or cleaned by washing in shower at the end of the project.

Contractor shall be responsible for assigning a worker to collect contaminated respirators, clean them, and re-filter them after each use.

Everyone entering the work area must follow this procedure completely every time he/she enters and leaves the work area.

#### 1.13 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

After each worker has been included in the Contractor's Respiratory Protection Program, completed the training program and medical examination, secure a fully executed written copy of this acknowledging completion of the training program.

END OF SECTION

## SECTION 1120 - RESPIRATORY PROTECTION

### 1.0 PART 1 - GENERAL

#### 1.01 DESCRIPTION

- A. Scope: Provide workers with respiratory protection to protect against exposure asbestos dust. Selection of appropriate respirator shall be based on table I (Appendix III). Based on type of ACM anticipated it is required to use PAPR with HEPA filters during the duration of the project, as Class I ACM (Surfacing) will be removed. Should fibers air concentration reach 0.5 f/cc, work will be stopped and abatement methods/engineering controls will be adjusted. Should air concentration reach/exceed 0.9 f/cc, PAPR protection will be changed to supplied air.
1. Prior to commencement of work, all workers shall be instructed, and shall be knowledgeable, of the appropriate procedures of asbestos removal.
  2. Contractor acknowledges and agrees that he is solely responsible for enforcing worker protection requirements at least equal to those specified herein.
  3. Provide workers with personally issued and marked respiratory equipment approved for asbestos by NIOSH and OSHA and suitable for the asbestos exposure level in the work area according OSHA Standard 29 CFR 1926.1101, and 29 CFR 1910.134.
  4. Where respirators with disposable filters are employed, provide sufficient approved filters for replacement as necessary by the applicable regulation.
  5. Except for governmental inspectors having jurisdiction, no visitors shall be allowed in work area except as authorized by Owner of Owner's Representative. Provide authorized visitors with suitable respirators as specified above.
- B. Respiratory Protection Requirements: Contractor shall be solely responsible for providing respiratory protection at all times which is in compliance with or in excess of OSHA requirements.
- C. Allowable Deviations: Contractor shall be allowed to deviate from the requirements of sub-paragraphs B.7 above when the following conditions are met:
1. Respiratory protection program is reviewed and approved by the requirements of Paragraph B above.

2. Contractor shall submit written request to Designer stating the air sampling results and detailing the need for deviation from the requirements of Paragraph B above.
3. Designer shall approve, reject or modify the Contractor's request within 24 hours of receipt of the request.
4. From work initiation, up to the Contractor's receipt of the Owner's Representative written approval for respiratory protection deviation, the Contractor is responsible for meeting all requirements of Paragraph B.
5. Upon receipt of the Owner's Representative written approval for respiratory protection.

END OF SECTION

## **SECTION 1130 - DECONTAMINATION UNIT**

### **1.0 PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of Contractor apply to work of this section. See Appendix III for location of the unit.

#### **1.02 DESCRIPTION OF WORK**

In locations where asbestos removal is to take place, the Contractor shall set up a decontamination facility that will consist of a change room, shower areas and equipment areas (see Appendix III).

An airtight tunnel shall be constructed between the Work Area and the entrance to the decontamination facility for the passage of workers and equipment into and out of the work area. Tunnel shall contain airlock prior to entering the Work Area.

Provide separate personnel and equipment decontamination facilities. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

#### **1.03 MATERIALS**

Duct Tape: Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to aggressively stick to sheet polyethylene.

Filters: Provide cascaded filter units on drain lines from showers or any other water source carrying contaminated water from the work area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.

Flame Resistant Polyethylene Sheet: Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small-Scale Fire Test for Flame-Resistant Textiles and films. Provide largest size possible to minimize seams, 4.0 or 6.0 mils thick, clear, frosted or black.

Heater: Provide an electric water heater of adequate size to ensure a continuous source of hot water (minimum temperature 120 degrees Fahrenheit) for the Personnel Decontamination Unit Shower.

Lumber: Provide kiln dried lumber of any grade or species.

Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to

minimize seams, 4.0 or 6.0 thick, clear, frosted or black.

Rubber Roofing: Provide uniform flat sheets of flexible sheet roofing material fabricated from EPDM (ethylene propylene diene monomer) or Neoprene (polychloroprene), in a nominal thickness of 20 to 40 mils.

Shower Head and Controls: Provide a factory-made shower head producing a spray of water which can be adjusted for spray size and intensity. Feed shower with water mixed with hot and cold supply lines. Arrange so that control of water temperature, flow rate, and shut off is from inside shower without outside aid.

Shower Pan: Provide one-piece waterproof shower pan 4' x 8' x 6" deep. Fabricate from seamless fiberglass minimum 1/16" thick reinforced with wood, 18-gallon stainless steel with welded seams, or a seamless liner of minimum 60 mil thick rubber roofing.

Shower Walls: Provide 8' long by approximately 7' high walls fabricated from rigid impervious, waterproof material, either corrugated fiberglass roofing or equivalent. Structural support as necessary for stability.

Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.

Sump Pump: Provide totally submersible water proof sump pump with integral float switch. Provide unit sized to pump 2 time the flow capacity of all showers or hoses supplying water to the sump, through the filters specified herein when they are loaded to the extent that replacement is required. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedure without damage to mechanism of pump. Adjust float switch so that a minimum of 3" remains between top of liquid and top of sump pan.

#### 1.04 INSTALLATION

- A. Personnel Decontamination Unit: Provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces consisting of a Changing Room, Shower Room, and Equipment Room. Required all persons without exception to pass through this decontamination unit for entry into and exiting from the work area for any purpose. Do not allow parallel routes from entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit, use loading area for this purpose. Provide temporary lighting within decontamination units as necessary to reach a lighting level of 100-foot candles.
- B. Changing Room (clean room): Provide a room that is physically and virtually separated from the work area for the propose of changing into protective clothing. Construct using polyethylene sheeting, at least 6 mils in thickness, to provide an airtight seal between the Changing Room and the rest of the building. Locate so

that access to Work Area from Changing Room is through Shower Room. Separate Changing Room from the building by a sheet polyethylene flapped doorway.

A TWO FLAP DOOR SHOULD BE USED IF NEGATIVE AIR SYSTEMS ARE NOT REDUNDANT.

Require workers to remove all street clothes in this room, dress in clean disposable coveralls, and don respiratory protection equipment. Do not allow asbestos contaminated items to enter this room. Require Workers to enter this room either from outside the structure dressed in street clothes, or naked from the showers.

The Changing Room shall have two (2) separate lockers or storage container so that employees can keep street clothes and clean work clothes separate.

An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workmen may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic. Authorization from this must be obtained from the Owner's Representative in writing prior to start of construction.

Maintain floor of changing room dry and clean at all times. Do not allow overflow of water from shower to wet floor in Changing Room.

Damp wipe all surfaces twice after each shift change with a disinfectant.

Provide a continuously adequate supply of disposable bath towels.

Provide posted information for all emergency phone numbers and procedures.

Provide one storage locker per employee.

- B. Shower Room: Provide a completely water tight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room. Construct room by providing one shower pan and two shower walls in a configuration that will cause water running down wall to drip into pan. Install freely draining wooden floor in shower pan at elevation of top of pan.

Separate this room from the Work Area with airtight walls fabricated of 6 mil polyethylene.

Separate this room the Changing and Equipment Rooms with airtight walls



fabricated of 6 mil polyethylene.

Provide splash-proof entrances to Changing and Equipment Rooms with two doors arranged in the following configuration:

At each entrance to the shower room construct a door frame out of 2 x 4 lumber with 1/2" jambs (sides) and 1/2" head (top) and sill (bottom). Attach to this door frame two overlapping flaps rubber roofing material, fastened at the head (top) and jambs (sides) by clamping between a 1/2" x 3/4" batten and frame. Overlap sill (bottom) by 1/2" minimum. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.

At 1'-0" toward shower from each entrance to the Shower Room construct a second 2 x 4 door head (top). Attach to this door head a one-piece flap of rubber roofing material, fastened at the top by clamping between a 1 1/2" x 3/4" batten and head, overlapping onto each side of shower by 1/2" and stopping 1" clear of shower floor.

Provide shower head and controls.

Provide temporary extensions of existing hot and cold water and drainage, as necessary for a complete and operable shower.

Provide a soap dish and continuously adequate supply of soap and maintain in sanitary condition.

Arrange so that water from shower does not splash into the Changing or Equipment Rooms.

Arrange water shut off and pump operation controls so that a single individual can shower with assistance from either inside or outside of the work area.

Provide a flexible hose shower head.

Pump waste to drain or to storage for use in amended water. If pumped to drain, provide 20-micron and 5-micron waste filters in line to drain or waste water storage. Change filters daily or more often if necessary. Located filters inside shower unit so that water lost during filter changes is caught by shower pan.

- C. Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers. Separate this room from the Work Area by a 6-mil polyethylene flap doorway.

Separate this room from the Work Area with airtight walls fabricated of 6 mil polyethylene.

Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6 mil polyethylene. Workers should proceed from the Equipment Area directly to the Shower Room.

- D. Work Area: Separate work area from Equipment Room by polyethylene barriers. The airborne asbestos level in the work area is expected to be high. Accordingly add an intermediate cleaning space between the Equipment room and the Work Area. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of 6 mil polyethylene per shift change. Provide one additional floor layer of 6 mil polyethylene per shift change and remove contaminated layer after each shift.

## 1.05 CONSTRUCTION

- A. Walls: Construct airtight walls using 3 layers of polyethylene sheeting, at least 6 mils in thickness. Attach to existing building components or to a temporary framework.
- B. Floors: Use 2 layers (minimum) of 6 mil polyethylene sheeting to cover floors in the Equipment, Shower (underneath shower pan), and Changing Rooms. Provide an additional layer in the Equipment Room for every shift change expected. Roll one layer of plastic from Equipment Room into Work Area after shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors. Use 3 layers (minimum) of 6 mil polyethylene sheeting to cover floors in the work area (see section 1100).
- C. Doors: Airlocks shall be installed between contaminated area and Equipment Room and Shower Room, Shower Room and Clean Room. Fabricate from overlapping sheets with openings a minimum of three (3') wide. Configure so that sheeting (3 layers) overlaps adjacent surfaces. Weight sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') between entrance and exit of any room.

If the decontamination area is located within an area containing asbestos overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/4-inch hardboard or 1/2-inch plywood "ceiling" with polyethylene sheeting, at least 4 mil thickness covering the top of the "ceiling".

- D. Visual Barrier: Where the decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 4 mils in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or

metal studs covered with minimum 1/4-inch-thick hardboard or 1/2-inch plywood. Where the solid barrier is provided, sheeting need not be opaque.

Alternate methods of providing decontamination facilities may be submitted to the Owner's Representative.

- E. Electrical: Provide sub-panel at Changing Room to accommodate all removal equipment. Power sub-panel directly from a building electrical panel. Connect all electrical branch circuits in decontamination unit and particularly pumps in shower room to a ground-fault circuit protection device.

## 1.06 DECONTAMINATION SEQUENCE

### A. Entering work Area

Worker enters Changing Room and removes street clothing, puts on clean disposable coveralls and respirator, and passes through the Shower Room into the Equipment Room.

Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.

### B. Exiting Work Area

Before leaving the work area, require the worker to remove all gross contamination and debris from overalls and feet. The worker then proceeds to the Equipment Room and removes all clothing except respirator protection equipment. Extra work clothing may be stored in contaminated end of the Equipment Room. Disposable coveralls are placed in a bag for disposal with other material. Decontamination procedures shall be followed by all individuals leaving the work area.

After showering the worker moves to the changing room and dresses in either new coveralls for another entry or street clothes in leaving.

## 1.07 EQUIPMENT DECONTAMINATION UNITS

Provide an Equipment Decontamination Unit consisting of a serial arrangement of rooms: Clean Room, Holding Room, and Wash Room for removal of equipment and material from Work Area. Do not allow personnel to enter or exit work area through the Equipment Decontamination Unit.

- A. Wash Down Station: Provide an enclosed shower unit located in Work Area just outside Wash Room as an equipment, bag and container cleaning station.

- B. Wash Room: Provide Wash for cleaning of bagged or containerized asbestos waste materials passed from the Work Area. Construct wash room of 2X wood framing and polyethylene sheeting, at least 6 mils in thickness and located so that packaged materials, after being wiped cleaned, can be passed to the Holding Room. Separate this room from the Work Area by a single flap of 6 mil polyethylene sheeting.
- C. Holding Room: Provide Holding Room as a drop location for contained asbestos containing materials passed from the Wash Room. Construct Holding Room of 2X framing and polyethylene sheeting, at least 6 mil thickness and located so that contained materials cannot be passed from the Wash Room through the Holding Room the Clean Room. Separate the room from the adjacent rooms by double flaps fabricated from 1/16" +/- single ply rubber roofing material, either EPDM or Neoprene.
- D. Clean Room: Provide clean Room to isolate the Holding Room from the Work Area. Construct Clean Room of 2X wood framing and polyethylene sheeting, at least 6 mils in thickness and locate to provide access to the Holding Room from the building exterior. Separate this room the exterior by a single flap of 6 mil polyethylene sheeting.
- E. Equipment and Material: Take all equipment or material from the Work Area through the Equipment Decontamination Unit according to the following procedure:

-At Wash Down station, thoroughly wet-clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.

-When passing equipment or containers into the Wash Room, close all doorways of the Equipment Decontamination Unit, other than the doorway between the Wash Down station and the Wash Room. Keep all outside personnel clear of the Equipment Decontamination Unit.

-Once inside the washroom, wet-clean the bags and/or the equipment.

-When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Holding Room and the Clean Room.

-Workers from the Work Area enter Holding Area and remove decontaminated equipment and/or containers for disposal.

-Require these workers to wear full protective clothing and wearing appropriate respiratory protection.

-At no time is worker from an uncontaminated area to enter the enclosure when a removal worker is inside.

-During the removal of waste and large equipment at the completion of the project, the Contractor shall be allowed to bypass the decontamination facility provided a separate chamber with airlocks has been constructed.

#### 1.08 CLEANING OF DECONTAMINATION UNITS

Clean debris and residue from inside of decontamination units on a daily basis or as otherwise indicated on contract drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis. If the Changing Room of the Personnel Decontamination Unit becomes contaminated with asbestos containing debris, abandon the entire decontamination unit and erect a new decontamination unit. Use the former Changing Room as an inner section of the new Equipment Room.

#### 1.09 SIGNS

See section 1100, paragraph 3.02 for appropriate signage.

END OF SECTION

## SECTION 1140 - REMOVAL OF ASBESTOS CONTAINING MATERIALS

### 1.0 GENERAL

The Contractor shall protect adjacent surfaces, specifically including enclosure containment surfaces, from damage from blasting work. Damages to non-protected adjacent surfaces shall be repaired at the Contractor's expense. In the event work area containment surfaces are damaged by blasting operations, blasting work shall stop and work area containment surfaces shall be repaired.

#### 1.01 PLASTICIZED BUILDING

A. Prior to Plasticizing Work Areas:

1. Clean Work Area with HEPA vacuum and wet cleaning.

B. Building Systems:

1. Shut down and isolate ventilating and air conditioning systems.
2. Disconnect electrical service and provide temporary electrical service.
3. Remove and dispose of HVAC filters, clean and HEPA vacuum adjacent interior of duct surfaces. Seal joints of fixed covers or casing and openings or vents with duct tape, then cover with plastic and tape to seal in place.
4. Seal return air floor vent/duct/louvers and leave sealed until after all work is complete.

C. Asbestos Control Area Masking and Sealing:

1. Establish each asbestos control area entrance and exit with airlock formed by plastic curtained doorways, portable partitions and other enclosures.
2. Plasticize all points of ingress and egress to the Work Area. At a minimum, provide a protective covering of floors, walls, and ceilings in control area with continuous membrane of two layers minimum of 6 mil plastic sheets to prevent water, or other damage.
3. Completely isolate Work Area from other parts of the building for the duration of the project to prevent asbestos dust and debris from escaping beyond asbestos control area.

4. Protect existing systems and functions. Isolate HVAC systems to prevent contamination to other areas of structure.
  5. Make watertight all fittings, connectors, etc., in exposed existing conduit systems in asbestos work areas during this work.
  6. Construct critical barriers.
  7. Protect all existing interior building finishes that are to remain from damage during asbestos removal work.
  8. Construct primary barriers.
- D. Inspection of Work Area: Prior to any removal of asbestos containing material, notify Owner's Representative for inspection. Plasticizing of Work Area, building of worker and equipment decontamination enclosure systems, and all equipment required for project shall be completed or stored on-site prior to notification.
- E. Maintenance of Enclosed Work Area and Decontamination Enclosure Systems: Ensure that barriers and plastic linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery. Visually inspect enclosures at the beginning of each work period. Use smoke methods to test effectiveness of barriers when directed by Owner's Representative.

## 1.02 WORK PROCEDURES FOR ASBESTOS REMOVAL

### A. General

Perform all asbestos abatement related work and comply with the general safety and health provisions in conformance with 29 CFR 1910.1025 and 29 CFR 1926.1101. A full decontamination unit is required at the entrance of the enclosed/controlled area where the asbestos removal will be executed. Disposable clothing and respiratory protection will be required. Discard and dispose of the disposable clothing as asbestos contaminated material. Decontamination facilities (29 CFR 1910.1025 and 29 CFR 1926.1101) including showers will be located in the general vicinity for use if the worker and/or worker's street clothing becomes asbestos contaminated.

- 1) Pre-clean the area using HEPA vacuum cleaners and wet wiping methods.
- 2) Remove ACM under wet removal conditions.
- 3) Bag and dispose of contaminated material in accordance with disposal procedures.
- 4) Thoroughly clean area through wet wiping, brushing, and HEPA vacuuming.

END OF SECTION

## **SECTION 1150 - WORK AREA CLEARANCE**

### **1.0 PART 1 - GENERAL**

#### **1.01 RELATED DOCUMENTS**

Drawings and general provisions of Contract apply to work of this section.

#### **1.02 CONTRACTOR RELEASE CRITERIA**

The Work is Complete when the work area is visually clean using ASTM 1369-14 guidance and aggressive air sampling indicates that asbestos concentrations have been reduced to the levels specified below.

#### **1.03 CLEANUP**

Maintain surfaces of the work area free of accumulations of dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the asbestos removal operation has been completed, clean the area of visible asbestos contamination by vacuuming with a HEPA filtered vacuum cleaner and wet mopping the area. Upon completion of mopping, a waiting period of 24 hours shall be preceding the next mopping and HEPA vacuum cycle. Upon completion of the 24 hours cycle, a visual inspection in accordance to ASTM standard ASTM 1368-14 will be conducted. Shall visual inspection comply with the criteria stipulated in the standard, lock down encapsulant will be applied, prior to collection of clearance samples.

#### **1.04 ANALYSIS**

Samples will be analyzed by Phase Contrast Microscopy (PCM), specifically by NIOSH 7400 Method. Transmission Electron Microscope (TEM) samples shall be collected (non-aggressive) and analyzed in accordance to AHERA protocol.

#### **1.05 CLEARANCE**

Decontamination of the work area shall be considered complete when every work area sample indicates less than 0.005 f/cc, as determined by PCM samples (pre-clearance) and less than 70s/mm<sup>2</sup> as determined by TEM.



At least two (2) PCM samples/per court room shall be collected for clearance purposes. In addition, two sets of five (5) TEM samples (5 samples inside the courtrooms) per floor area shall be collected using AHERA's non-aggressive sampling protocol. Accordingly, eighteen (18) PCM samples and ten (10) TEM samples will be collected from the 7<sup>th</sup> and 6<sup>th</sup> floors, respectively.

If any sample collected will be above the clearance levels, then decontamination is incomplete and the contractor shall reclean, with all resampling costs incurred by the Contractor. Clearance samples will be collected by owner representative.

END OF SECTION

## **SECTION 1160 - DISPOSAL OF ASBESTOS CONTAINING MATERIALS**

### **1.0 PART 1 - GENERAL**

#### **1.01 DISPOSAL DOCUMENTATION**

Submit written evidence that the hazardous waste treatment, storage, or disposal facility is approved for disposal by the applicable federal and local agencies. Submit one copy of the completed manifest, signed and dated by the initial transporter in accordance with 40 CFR 262.

#### **1.02 PAYMENT FOR HAZARDOUS WASTE**

Payment for disposal of asbestos waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of asbestos containing materials delivered is returned and a copy is furnished to the Owner's Representative.

#### **1.03 DISPOSAL OF ASBESTOS WASTE**

##### **1. Asbestos Waste**

All materials containing asbestos or that may be contaminated with asbestos must be disposed of as asbestos waste. This includes, but is not limited to demolition debris, asbestos containing waste, all plastic sheeting, overalls, tape, etc. The material shall be transported by an authorized hauler and disposed in an DRNA approved landfill in Puerto Rico. The signs shall be bilingual and include the following phrases:

**DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD**

##### **2. Remove Containers**

As work progresses, the Contractor shall remove sealed and labeled containers so that available storage space is not exceeded (24 hours maximum for stores waste).

##### **3. Temporary Storage**

If temporary storage at the job site is to occur, the area must be secured from entrance by unprotected persons. Temporary storage off the job site is not permissible.

4. Disposal of Asbestos Waste Form

Contractor shall submit to the Consultant the completed Disposal of Asbestos Waste Form and attached receipt given at the dumpsite.

5. Transporting Waste Materials

Waste materials must be transported in enclosed or covered trucks to prevent loose containers from falling off the vehicle and to protect the public in case of accident. EPA and DOT warning labels must be used. The label should read:

**RQ, ASBESTOS, 9, NA-2212, PG III**

All commercial transporters must submit their ICC permit to haul asbestos containing materials.

6. Disposal Site Dumping

At the disposal site, sealed bags may be dumped into the burial site unless the bags have been broken or damaged, and if the disposal site allows bags to be buried.

- a. Damaged bags shall be placed in a 6 mil. bag and resealed bags shall be buried.
- b. Uncontaminated drums may be recycled, if applicable.

7. Dumpsite Procedure

At the dumpsite, the bags or barrels must be carefully lowered into approved landfills by the workers.

8. Transporting Waste

Contractor shall notify Consultant or proposed date and time of transporting waste to the landfill. The workers who unload the asbestos should use approved respirators and protective clothing. Transporting vehicle should be properly labeled.

9. Authorized Disposal Site

Disposal of asbestos shall be at an authorized disposal site in accordance with the requirements of the appropriate disposal authorities.

10. Disposal Procedure

All bags shall be placed, intact, in an excavated area and covered with a maximum of six (6) inches of dirt and covered at the end of each working day and be properly marked.

#### 1.04 ABATEMENT CLOSEOUT

Asbestos abatement work is substantially completed upon meeting the requirements of this section, including submission of:

1. Certificate of visual inspection and analytical results of final clearance
2. Receipts documenting proper disposal.
3. Punch list detailing repairs to be made and incomplete items.

#### 1.05 CERTIFICATE OF VISUAL INSPECTION

A "Certificate of Visual Inspection" is to be completed by the by the Consultant. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this certification is executed.

END OF SECTION

## **SECTION 1170 – WORKING TEAM**

The team selected for this project is as follow:

Contractor: To be selected

Laboratory, Project Monitor and personal air samples: AES International

Project Designer: Ady Padan, Ph. D

Project Inspector-Elme Rivera, Mildred Santiago, Anthony Rivera, Amaryllis Rivera, Javier Medina

Project Industrial Hygienist-AESI team

Transporter: To be provided by the selected contractor


Disposal site: To be provided by the selected contractor

END OF SECTION

## SECTION 1180 - ASBESTOS ABATEMENT ALTERNATES

The undersigned proposes to perform additional work, omit certain items, and to effect certain substitutions called for in the following Asbestos Alternate Bids, as described in Section 1.1 of this Specification Documents for the following resulting additions or deductions to the Base Bid. All the Alternate Bid Prices include overhead and profit. Refer to Section 1.0 - Asbestos Containing Materials to be Abated.

- A. Removal and Disposal of asbestos containing materials according to scope of work for nine courthouses (Phase I and II)  
Lump Sum, no permits. \$ \_\_\_\_\_
- B. ADDITION of Removal and Disposal of  
Spray on ceiling per square foot \$ \_\_\_\_\_
- C. ADDITION of Removal and Disposal of  
Vinyl floor tiles/mastic (sq.ft) \$ \_\_\_\_\_
- D. ADDITION of Removal and Disposal of  
Black sealant on HVAC ducts (sq.ft) \$ \_\_\_\_\_

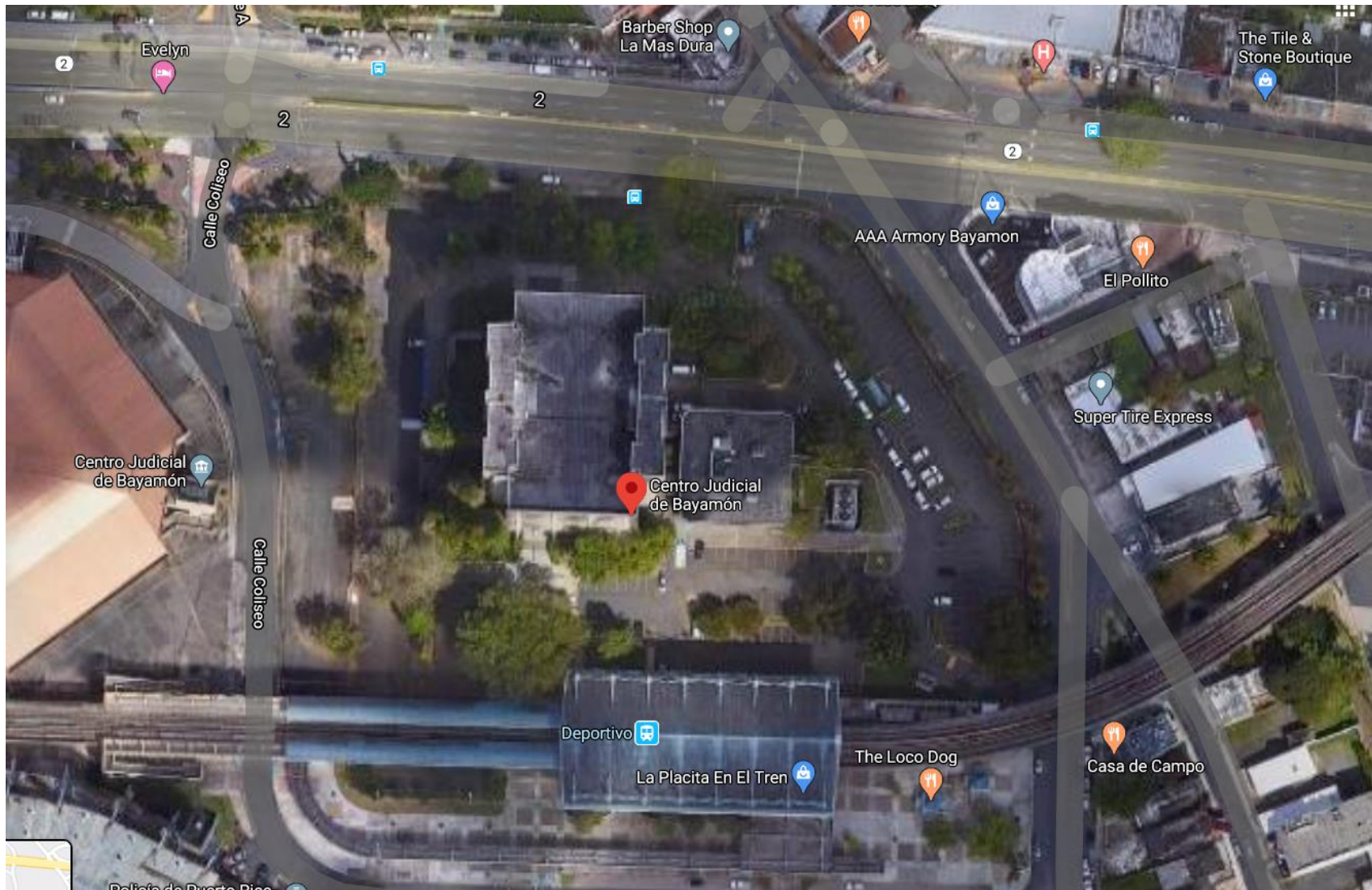
Reviewed By:   
Ady Padan, Ph.D. 4/30/2021  
AHERA Project Designer  
No. ASB-0820-0220-PD

# Appendix I





**General View of Centro Judicial de Bayamon located on PR-2, Km 10.4 Esteban Padilla Corner, Bayamon, Puerto Rico.**

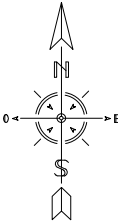





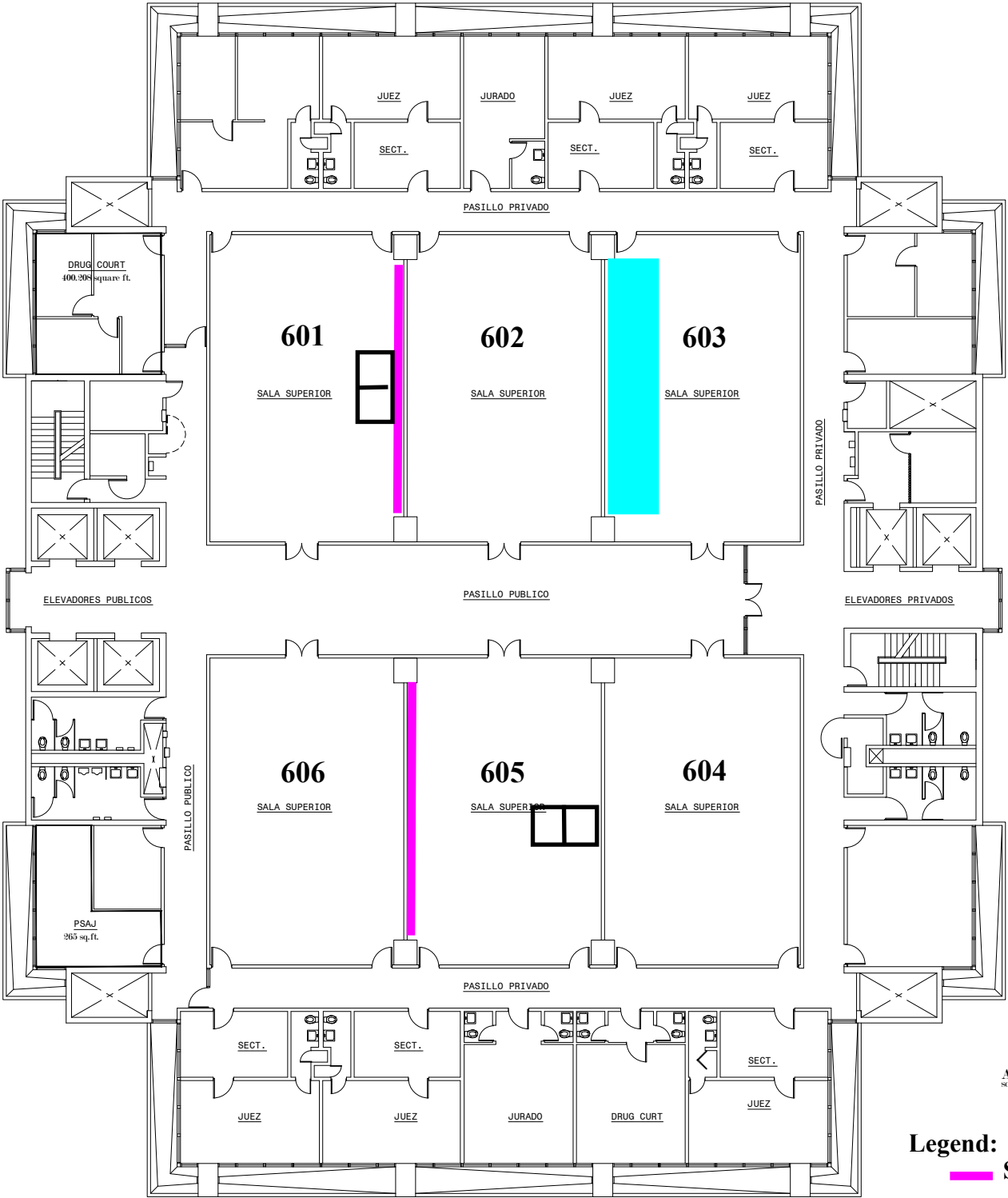
# Appendix II



Scope of Spray On Ceiling Partial Abatement for Courtrooms located on the 6th Floor, Centro Judicial de Bayamon, Bayamon, Puerto Rico.





 **601**  
Remove spray on ceiling  
Only joists between 4 and 6

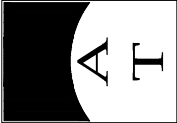


AS-BUILT PLAN FOR 6th. FLOOR LEVEL  
SCALE 1/8" = 1'-0"

**Legend:**  
 Strip 2" Spray on Ceiling along the border line

 **603**  
Remove all spray on ceiling  
up to the 2nd joist

 **605**  
Remove spray on ceiling on  
joist around light fixture, between  
joists 4 and 5 from Judge entrance  
wall and between wall and joist 2.

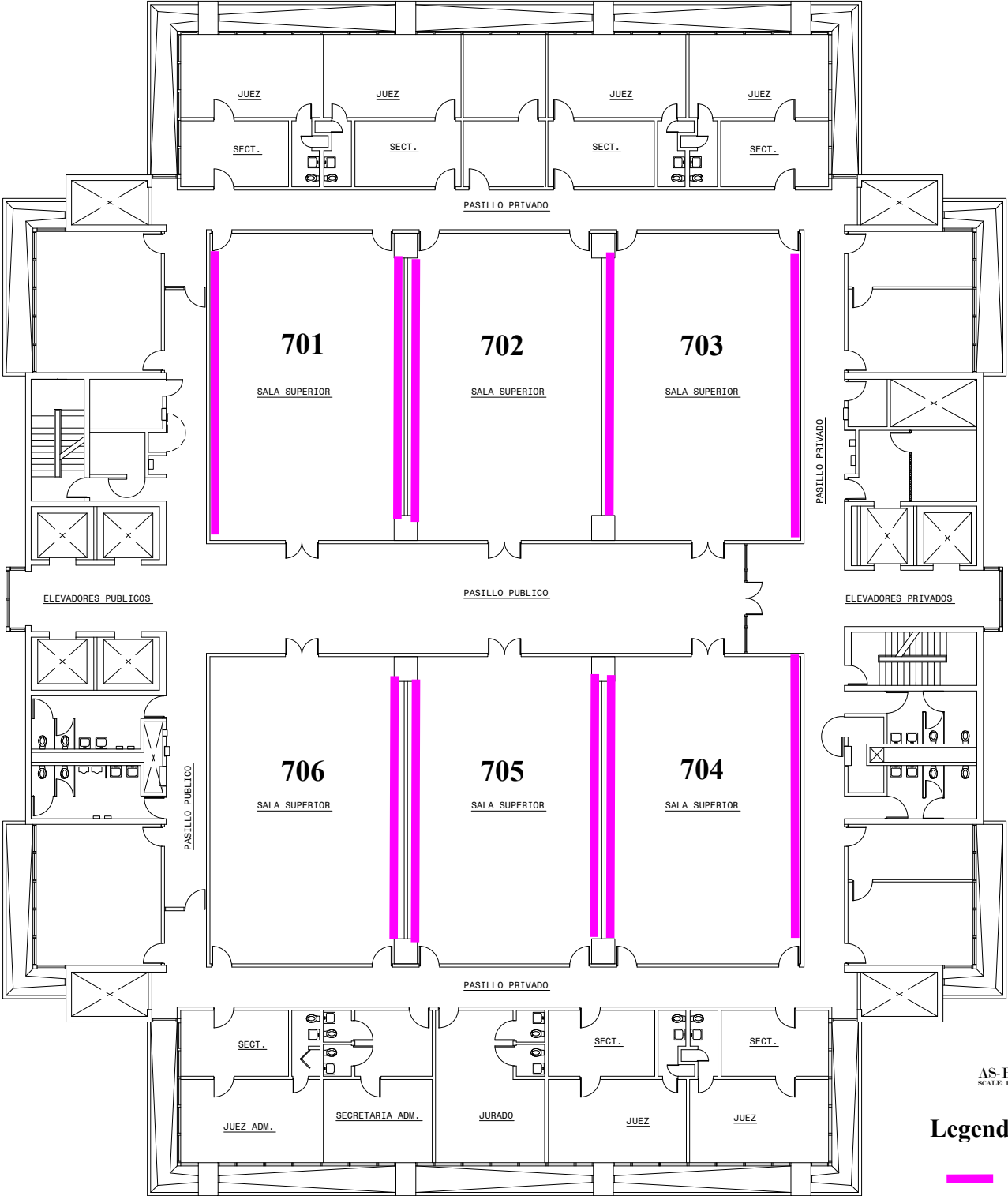
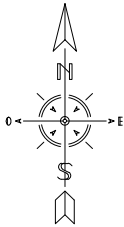


R E V I S I O N S			
NO.	DESCRIPTION	DATE	BY

TRIBUNAL GENERAL DE JUSTICIA OFICINA DE ADMINISTRACION DE LOS TRIBUNALES DIRECTORIA DE ADMINISTRACION DIVISION DE LOCALES Y SERVICIOS ESPECIALES	APPROVED BY:  APPROVED DATE:
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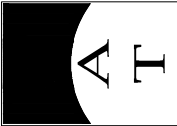
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PROJECT LOCATION: CENTRO JUDICIAL DE BAYAMON, BAYAMON	DRAWING DATE: 25-APR-2008	DRAWING BY: R. OVIEDO
PROJECT DESCRIPTION: PUNTA EXISTENTE DEL 6to. PISO	PRINTING DATE: 20-OCT-2008	FILE NAME: 0401-6th_PISO-AS-BUILT.dwg
PROJECT NUMBER: 0401-6th_PISO-AS-BUILT.dwg	PROJECTED BY:	OF:
AS-07		

Scope of Spray On Ceiling Partial Abatement for Courtrooms located on the 7th Floor, Centro Judicial de Bayamon, Bayamon, Puerto Rico.



AS-BUILT PLAN FOR 7th. FLOOR LEVEL  
SCALE: 1/8" = 1'-0"

**Legend:**  
Strip 2" Spray on Ceiling along the border line



R E V I S I O N S			
NO.	DESCRIPTION	DATE	BY

TRIBUNAL GENERAL DE JUSTICIA OFICINA DE ADMINISTRACION DE LOS TRIBUNALES DIRECTORIA DE ADMINISTRACION DIVISION DE LOCALES Y SERVICIOS ESPECIALES	APPROVED BY:  APPROVED DATE:
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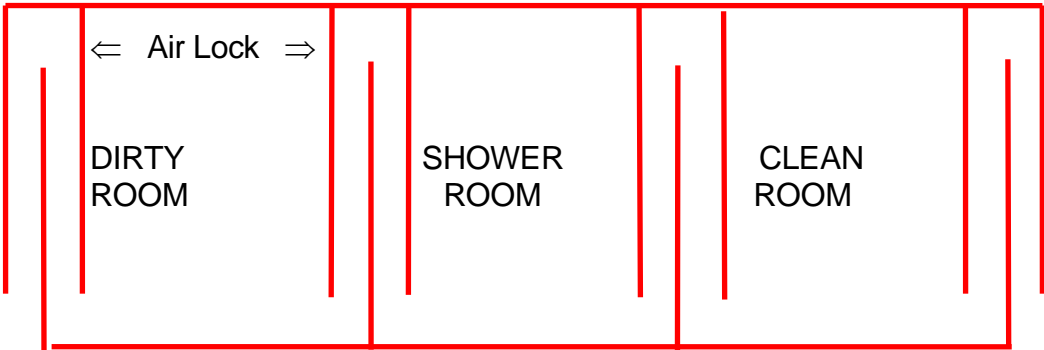
PROJECT NAME: DIGITALIZACION PLANOS C.J.-BAYAMON		PROJECT DATE: 22-400-2008
PROJECT LOCATION: CENTRO JUDICIAL DE BAYAMON, BAYAMON		DRAWING DATE: 25-400-2008
DRAWING DESCRIPTION: PLANTA EXISTENTE DEL 7mo. PISO		PRINTING DATE: 20-000-2008
DRAWING DESIGNED BY: R. OVIEDO		DRAWING SCALE: 1/8" = 1'-0"
DRAWING CHECKED BY: R. OVIEDO		FILE NAME: 0001-7mo. PISO-AS-BUILT.dwg
DRAWING DESIGNED BY: R. OVIEDO		AS-08



# Appendix III



**MODEL OF THE DECONTAMINATION UNIT**



# Appendix IV



## RESPIRATORY PROTECTION FOR ASBESTOS 1

<i>LEVEL</i>	<i>AIRBORNE CONCENTRATION OF ASBESTOS</i>	<i>REQUIRED RESPIRATORS</i>
1	Not in excess of 1 f/cc (10 X PEL)	Half-mask air-purifying respirator, other than a disposable respirator, equipped with high efficiency filters.
2	Not in excess of 5 f/cc (50 X PEL)	Full face piece air purifying respirator equipped with high efficiency filters.
3	Not in excess of 10 f/cc (100 X PEL)	<ol style="list-style-type: none"> <li>1. Any powered air purifying respirator equipped with high efficiency filters.</li> <li>2. Any supplied-air respirator operated in continuous flow mode.</li> </ol>
4	Not in excess of 100 f/cc (1000 X PEL)	Full face piece supplied air respirator operated in pressure demand mode
5	Greater than 100 f/cc (>1,000 X PEL) or unknown concentration	Full face piece supplied air respirator operated in pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus.

Note: For this project PAPR's will be used at all times.