SECTION 02080

ASBESTOS ABATEMENT
03/92

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS

Pub #4545	(1994) OSHA Analytical Methods Manual

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z9.2	(1979; R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z87.1	(1989; Errata; Z87.1a) Occupational and Educational Eye and Face Protection
ANSI Z88.2	(1992) Respiratory Protection

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 732	(1982; R 1987) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 522	(1992) Mandrel Bend Test of Attached Organic Coatings
ASTM D 1331	(1989) Surface and Interfacial Tension of Solutions of Surface-Active Agents
ASTM D 2794	(1990) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 4397	(1991) Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
ASTM E 84	(1991a) Surface Burning Characteristics of Building Materials
ASTM E 96	(1993) Water Vapor Transmission of Materials
ASTM E 119	(1988) Fire Tests of Building Construction and Materials
ASTM E 736	(1986; R 1991) Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members

ASTM E 1368	(1990) Visual Inspection of Asbestos Abatement Projects

CODE OF FEDERAL REGULATIONS (CFR)

CFR 29 Part 1910	Occupational Safety and Health Standards
CFR 29 Part 1926	Safety and Health Regulations for Construction
CFR 40 Part 61	National Emission Standards for Hazardous Air Pollutants
CFR 40 Part 763	Asbestos

COMPRESSED GAS ASSOCIATION (CGA)

CGA G-7	(1990) Compressed Air for Human Respiration
CGA G-7.1	(1989) Commodity Specification for Air

ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA 340/1-90-018	(1990) Asbestos/NESHAP Regulated Asbestos Containing Materials Guidance
EPA 340/1-90-019	(1990) Asbestos/NESHAP Adequately Wet Guidance
EPA 20T-2003	(1990) Managing Asbestos in Place A Building Owner's Guide to Operations and Maintenance Programs for Asbestos-Containing Materials

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 10	(1990) Portable Fire Extinguishers
NFPA 70	(1993) National Electrical Code
NFPA 90A	(1993) Installation of Air Conditioning and Ventilating Systems
NFPA 101	(1994) Safety to Life from Fire in Buildings and Structures
NFPA 701	(1989) Methods of Fire Test for Flame-Resistant Textiles and Films

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH (NIOSH)

NIOSH Pub No. 84-100	(1984; Supple 1985, 1987, 1988 & 1990) NIOSH Manual of Analytical Methods

UNDERWRITERS LABORATORIES (UL)

UL 586	(1990) High-Efficiency, Particulate, Air

Filter Units

1.2 DEFINITIONS

1.2.1 Adequately Wet

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-019that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

1.2.1.1 Agressive Method

Removal or disturbance of building material by sanding, abrading, grinding, or other method that breaks, crumbles, or disintegrates intact ACM.

1.2.2 Amended Water

Water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.

1.2.2.1 Asbestos

Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophylite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

1.2.2.2 [Asbestos-Containing Construction Material (CAL OSHA):

Any manufactured construction material which contains more than one tenth of one percent asbestos by weight.]

1.2.2.3 Asbestos-Containing Material

Any material containing more than one percent asbestos

1.2.2.4 Authorized Person

Any person authorized by the Contractor and/or Contracting Officer and required by work duties to be present in regulated areas.

1.2.3 Friable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-018that means any material containing more than 1 percent asbestos as determined using the method specified in CFR 40 Part 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

1.2.4 Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-018that means any material containing more than 1 percent asbestos as determined using the method specified in CFR 40 Part 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

1.2.5 Category I Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-018that means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in CFR 40 Part 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy.

1.2.6 Category II Nonfriable ACM

A term as defined in CFR 40 Part 61, Subpart M and EPA 340/1-90-018that means any material, excluding Category I nonfriable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, CFR 40 Part 763, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

1.2.6.1 Class I Asbestos Work

Activities involving the removal of thermal system insulation (TSI) and surfacing ACM.

1.2.6.2 Class II Asbestos Work

Activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastic.

1.2.6.2 Class III Asbestos Work

Repair and maintenance operations, where ACM, including thermal system insulation and surfacing material, is likely to be disturbed.

1.2.6.2 Class IV Asbestos Work

Maintenance and custodial activities during which employees contact ACM and activities to clean up waste and debris containing ACM.

1.2.6.2 Competent Person

In addition to the definition in CFR 29 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them.

1.2.6.2 Critical Barrier

One or more layers of 6-mil plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

1.2.6.2 Disturbance

Contact which releases fibers from ACM or debris containing ACM. This term includes activities that disrupt the matrix of ACM, render ACM friable, or generate visible debris. Disturbance includes cutting away small amounts of ACM no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event shall the amount of ACM so disturbedexceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

1.2.6.2 Intact

ACM which has not crumbled, been pulverized, or otherwise deteriorated so that it is no longer likely to be bound with its matrix.

1.2.6.2 Negative Initial Exposure Assessment

A demonstration by the Contractor that employee exposure during an operation is expected to be consistently below the PELs (TWA and Excursion Limit).

1.2.7 Asbestos Regulated Work Area

An asbestos regulated work area is an area established by the Contractor to demarcaate areas where Class I, II and III asbestos work is conducted, and any adjoining area where debris and waste from sudh asbestos work accumulate; and a work area within which airborne concentrations of asbestos exceed or there is a renewable possiblity they may exceed the permissible exposure limit. This area may be contained and controlled either by an enclosed containment (full containment area, single or double

bulkhead containment area, mini-containment area), modified containment, glove bag or outdoor techniques, where asbestos containing materials (ACM) operations are performed and isolated by physical boundaries to prevent the spread of ACM and control access to authorized persons. A full containment, single or double bulkhead containment area, mini-containment area, modified containment, and glove bag work area is isolated within a containment enclosure in which ACM operations are performed. An outdoor regulated work area is not isolated within a containment enclosure, but is otherwise secured by means of physical barriers, boundary warning tape, and signage, etc., to control access by unauthorized persons.

1.2.8 Time-Weighted Average (TWA)

The TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of CFR 29 Part 1926, Section 1926.58.

1.3 DESCRIPTION OF WORK

The work covered by this section includes the requirements for the removal or encapsulation of materials containing asbestos, construction, alteration, repair, maintenance or renovation of structures, substrates, asbestos spill/emergency cleanup, transportation, disposal, storage, containment of, and housekeeping activities involving asbestos or products containing asbestos. Activities include [Class I] [and] [Class II] and [Class III] [and] [Class IV] work involving asbestos containing materials (ACM) which are encountered during repair, construction and demolition projects and describes procedures and equipment required to protect workers and occupants of the work area from contact with airborne asbestos fibers and ACM dust and debris. More specific operational procedures shall be outlined in the required Asbestos Hazard Abatement Plan called for elsewhere in this specification. The specific ACM to be abated is identified on the detailed plans and project drawings. A summary of each individual ACM abatement work task is included in Table 1, "Summary of Asbestos Abatement Work Tasks". The summary information, for each work task, identifies: the number of work tasks in alpha sequence (i.e. A, B, C,... etc.;); the location of the ACM; brief description of the material; the required asbestos technique to be employed (removal, encapsulation, encasement, enclosure, repair); the OSHA work Class designation (I, II, III, IV)the friability designation (friable, nonfriable category I or nonfriable category II); the form and condition (interior architectural (IA), exterior architectural (EA), or mechanical and electrical (ME) and the condition - good, fair, poor); quantity (linear and /or square feet); the required RESPONSE ACTION DETAIL SHEET number specific to the work task (depicts the abatement technique requirements and item to be abated) and the required SET-UP DETAIL SHEET numbers (depicts the required methods of containment and control) specified by the Response Action Detail Sheet. The required RESPONSE ACTION DETAIL and SET-UP DETAIL SHEETS for each work task are appended to Table 1, herein. [This abatement work is governed by CFR 40 Part 763.]

1.4 SECURITY

[Twenty-four hour security guard] [Fenced and locked security area] [_____] shall be provided for each asbestos regulated work area. A log book shall be kept documenting entry into and out of the asbestos regulated work area. Entry into asbestos regulated work areas shall only be by personnel authorized by the Contractor and Contracting Officer. Personnel authorized

to enter asbestos regulated work areas shall be trained, medically evaluated and wear the personal protective equipment, as required by this specification, for the specific asbestos regulated work area to be entered.

1.5 MEDICAL REQUIREMENTS

Medical requirements shall conform to CFR 29 Part 1926, Section 1926.58.

1.5.1 Medical Examinations

Before being exposed to airborne asbestos fibers, workers shall be provided with a comprehensive medical examination as required by CFR 29 Part 1926, Section 1926.58 and other pertinent state or local requirements. This requirement must have been satisfied within the past year. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos and within 30 calendar days before or after the termination of employment in such occupation. X-ray films of asbestos workers shall be identified to the consulting radiologist and medical record jackets shall be marked with the word "asbestos."

1.5.2 Medical and Exposure Records

Complete and accurate records shall be maintained of each employee's medical examinations, medical records and exposure data as required by CFR 29 Part 1910, Section 1910.20 and CFR 29 Part 1926, Section 1926.58 for a period of [50 years] [indefinite time] after termination of employment. Records of the required medical examinations and exposure data shall be made available for inspection and copying to: The Assistant Secretary of Labor for Occupational Safety and Health (OSHA) or authorized representatives of the employee and an employee's physician upon request of the employee or former employee. Maintain on file at the work site for review as requested by the Contracting Officer, a copy of the required medical certification for each employee.

1.6 TRAINING

Within 1 year prior to assignment and commencement of work on this asbestos abatement project, each worker directly involved in Class I, II and III activities, handling ACM, ACM generated wastes to include packaging and transporting such wastes for disposal, shall take and successfully complete a course of asbestos training as specified by [United States Environmental Protection Agency (EPA) requirements at CFR 40 Part 763, Subpart E, Appendix C] [or] [the state of [_____] regulation no. [_____]. Workers shall take and successfully complete the "Worker" course. On-site supervisors and technical support personnel shall take and successfully complete the "Contractor/ Supervisor" course. [Inspection (sampling activities) undertaken to determine the presence of additional ACM shall be conducted by personnel who have successfully completed the "Building Inspectors" course.] [Project designer personnel shall take and successfully complete the "Project Designer" course.] Worker and Contractor/Supervisor cCourses taken more than 1 year prior to commencement of work are acceptable provided that the individual has successfully completed the annual refresher training as required by the regulatory agency. In addition, prior to the commencement of work, each worker shall be instructed by the Contractor's industrial hygienist and onsite "competent person" supervisor in the following project specific training: the hazards and health effects of the specific types of ACM to be abated, the content and requirements of the Contractor's Asbestos Hazard Abatement Plan, Accident Prevention Plan, Hazard Communication Program, Respiratory

Protection Program site-specific safety and health precautions, work practices, the use requirements and limitations of the personal protective clothing, equipment, and respirators to be used, hands-on-training for each asbestos abatement technique to be employed, heat and/or cold stress monitoring specific to this project, personal hygiene and housekeeping requirements, air monitoring program and procedures, medical surveillance to include medical and exposure record keeping procedures, the association of cigarette smoke and asbestos-related disease, security procedures, emergency response requirements andthe contents of CFR 29 Part 1926, Section 1926.58 and its Appendices. Training shall also include, for each employee, a respirator fit test administered by the Contractor's Industrial Hygienist as required by CFR 29 Part 1926, Section 1926.58.

1.7 RESPIRATORY PROTECTION PROGRAM

The Contractor's Industrial Hygienist shall establish in writing, and implement a respiratory protection program in accordance with CFR 29 Part 1926, Section 1926.58, CFR 29 Part 1910, Section 1910.134, ANSI Z88.2, CGA G-7 and CGA G-7.1. DETAIL SHEET NO. 12 entitled "Respiratory Protection Table" is appended herein and shall be used by the Contractor's Industrial Hygienist to establish minimum respiratory protection requirements based on measured or anticipated levels of airborne asbestos fiber concentrations encountered during the performance of the asbestos abatement work. The Contractor's respiratory protection program shall include, but not be limited to, the following elements:

a. The company policy, used for the assignment of individual responsibility, accountability, and implementation of the respiratory protection program.

b. The standard operating procedures covering the selection and use of respirators. Respiratory selection shall be determined by the hazard to which the worker is exposed.

c. Medical evaluation of each user to verify that the worker may be assigned to an activity where respiratory protection is required.

d. Training in the proper use and limitations of respirators.

e. Respirator fit-testing, i.e., quantitative, qualitative and individual functional fit checks.

f. Regular cleaning and disinfection of respirators.

g. Routine inspection of respirators during cleaning and after each use when designated for emergency use.

h. Storage of respirators in convenient, clean, and sanitary locations.

i. Surveillance of work area conditions and degree of employee exposure (e.g., through air monitoring).

j. Regular evaluation of the continued effectiveness of the respiratory protection program.

k. Recognition and procedures for the resolution of special problems as they affect respirator use (e.g., no facial hair that comes between the respirator face piece and face or interferes with

valve function; prescription eye wear usage; prohibition of wearing contact lenses; etc.).

l. Proper training in putting on and removing respirators.

1.8 HAZARD COMMUNICATION PROGRAM

A hazard communication program shall be established and implemented in accordance with CFR 29 Part 1926, Section 1926.59.

1.9 SAFETY AND HEALTH COMPLIANCE

In addition to detailed requirements of this specification, the work shall comply with applicable laws, ordinances, criteria, rules, and regulations of Federal, state, regional, and local authorities regarding handling, storing, transporting, and disposing of asbestos waste materials and with the applicable requirements of CFR 29 Part 1910, CFR 29 Part 1926, CFR 40 Part 61, Subpart A, and CFR 40 Part 61, Subpart M, NFPA 10, NFPA 70, NFPA 90A, NFPA 101. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution before starting work. Where the requirements of this specification, applicable laws, rules, criteria, ordinances, regulations, and referenced documents vary, the most stringent requirement as defined by the Contracting Officer shall apply. The following state and local laws, rules and regulations regarding removal, encapsulation, encasement, enclosure, demolition, renovation, handling, storing, transporting and disposing of asbestos material apply:

a. [_____] b. [_____] c. [_____]

1.10 INDUSTRIAL HYGIENIST (IH)

[Personal] [area/environmental] [_____] air sampling and training shall be conducted under the direction of an IH experienced in asbestos abatement and who is currently [certified in the comprehensive practice of industrial hygiene] [considered board eligible] by the American Board of Industrial Hygiene (ABIH). The IH shall have a minimum of 2 years asbestos abatement experience and shall have successfully completed the Contractors and Supervisors [and] [Project Designer] courses. For the purpose of this contract, the Contractor shall retain the services of an independent IH to perform [all contract required air monitoring] [Occupational Safety and Health Administration (OSHA) related sampling only]. .

1.11 COMPETENT PERSON

On all worksites where employees are engaged in Class I or II asbestos work, the competent person shall perform or supervise the following duties, as applicable:

a. Set up the regulalted area, enclosure, or other containment;
b. Ensure (by on-site inspection) the integrity of the enclosure or containment;
c. Set up procedures to control entry to and exit from the enclosure and/or area;
d. Supuervise all employee exposure monitoring and ensure that it is conducted as required;
e. Ensure that employees working within the enclosure and/or using glove bags wear protective clothing and respirators as required.

f. Ensure through on-site supervision that employees set up and remove engineering controls, use work practices and personal protective equipment in compliance witih all requirements;

g. Ensure that employees use the hygiene facilities and observe the decontamination procedures specified;

h. Ensure through on-site inspections that engineering controls are functioning properly and employees are using proper work practices; and,

i. Ensure notification of other employees on site.

1.11 PERMITS, LICENSES AND NOTIFICATIONS

Necessary permits [and licenses] shall be obtained in conjunction with the project asbestos abatement, transportation and disposal actions and timely notification furnished of such actions required by Federal, state, regional, and local authorities and as otherwise specified herein. The [Contractor shall] [Government will] notify the [Regional Office of the USEPA] [state's environmental protection agency responsible for asbestos air emissions] [local air pollution control district/agency] and the Contracting Officer in writing at least [10] [_____] days prior to the commencement of work in accordance with CFR 40 Part 61, Subpart M, state and local requirements to include the mandatory "Notification of Demolition and Renovation Record" form and other required notification documents. Notification shall be by Certified Mail - Return Receipt Requested. The Contractor shall furnish copies of the receipts to the CO prior to the commencement of work.

The Contractor shall notify the CO if any of the following occur:

a. If the Contractor or any of its subcontractors are served with notice of violation of any law, regulation, permit or license which relates to this Contract.

b. Proceedings are commenced which could lead to revocation of related permits or licenses.

c. Permits, licenses or other government authorizations relating to this Contract are revoked.

d. Litigation is commenced which would affect this Contract.

e. If the Contractor or any of its Subcontractors become aware that its equipment or facilities are not in compliance or may fail to comply in the future with applicable laws or regulations.

1.12 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01300 SUBMITTAL DESCRIPTIONS:

SD-01 Data

Materials and Equipment; FIO.

Manufacturer's catalog data for all materials and equipment to be used in

the work, including brand name, model, capacity, performance characteristics and any other pertinent information. Test results and certificates from the manufacturer of encapsulants substantiating compliance with performance requirements of these specifications. Material Safety Data Sheets for all chemicals to be used onsite in the same format as implemented in the Contractor's HAZARD COMMUNICATION PROGRAM.

a. High efficiency filtered local exhaust equipment

b. Vacuum equipment

c. Pressure differential monitor

d. Air monitoring equipment

e. Respirators

f. Personal protective clothing and equipment

(1) Coveralls

(2) Underclothing

(3) Other work clothing

(4) Foot coverings

(5) Hard hats

(6) Eye protection

(7) Other items required and approved by Contractor's IH

g. Glove Bag

h. Duct Tape

i. Disposal Containers

(1) Disposal bags

(2) Fiberboard drums

(3) Paperboard boxes

j. Sheet Plastic

(1) Polyethylene Sheet - General

(2) Polyethylene Sheet - Flame Resistant

(3) Polyethylene Sheet - Reinforced

k. Wetting Agent

(1) Amended Water

(2) Removal encapsulant

l. Strippable Coating

m. Prefabricated Decontamination Unit(s)

n. Other items

o. Chemical encapsulant

p. Chemical encasement materials

q. Material Safety Data Sheets (for all chemicals proposed)

Safety Plan; GA.

A written Safety and Occupational Health Program (SHP) and a comprehensive site-specific Accident Prevention Plan (APP) at least [30] [_____] days prior to start of work. The APP shall include the submission during the project, of Activity Hazard Analyses for each major phase of work. The required respiratory protection and hazard communication program shall be incorporated into the APP. This plan must be accepted in writing by the Contracting Officer prior to start of any site work.

Asbestos Hazard Abatement Plan; GA.

A detailed plan of the response actions to be taken (ACM items to be abated and method of abatement for each abatement work task - see each RESPONSE ACTION DETAIL SHEET) and the control procedures (containment techniques to include safety precautions and work procedures; See SET-UP DETAIL SHEETS) to be used in the abatement of the ACM. The plan shall take into consideration all the individual ACM abatement work tasks as summarized in paragraph DESCRIPTION OF WORK and table 1. The plan shall be prepared by, signed [and] [sealed including certification number] and dated by the Contractor's IH. Such plan shall include, but not be limited to the precise personal protective equipment to be used, the location of asbestos regulated work areas including clean and dirty areas, access tunnels, decontamination unit (clean room, shower room, equipment room, storage areas such as load-out unit), abatement method, level of supervision to include roles, responsiblities and authorities, interface of trades involved in the construction, sequencing of asbestos related work, disposal procedures and plan, type of wetting agent and asbestos encapsulant to be used, location of local exhaust equipment, planned air monitoring strategies, and a detailed description of the method to be employed in order to control the spread of ACM wastes and airborne fiber concentrations. The plan shall also include both fire and medical emergency response procedures and the specific security procedures to be used for all asbestos regulated work areas. The asbestos hazard abatement plan shall be submitted at least [30] [_____] days prior to start of work. This plan must be accepted in writing prior to the start of any asbestos abatement work.

Initial Exposure Assessment;GA

The Contractor shall ensure that a "competent person" conducts an exposure assessment immdiately before or at the initiation of the operation to ascertain expected exposures during that operation. The assessment must be comleted and the results submitted in the Asbestos Hazard Abatement Plan. In addition to measurement results, the assessment must review relevant controls and conditions, factors that influence the degree. TGhese include, but are not limited to, the degree and quality of supervision and

of employee training, techniques used for wetting the ACM in the various circumstances encountered, placing and repositioning the ventilation equipment, and impacts due to weather conditions. The assessment must be based on the competent person's review of all aspects of the Contractor's performance doing similar jobs. Only if similar controls are used and the work supervised by the same or similarly trained personnel, may past data be relied on. The assessment shall include consideration of all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of the Contractor which indicate the levels of airborne asbestos likely to be encountered on the job. However, the assessment may conclude that exposures are likely to be consistently below the PELs only as a conclusion of a "negative exposure assessment". The Contractor shall monitor employees at the beginning of the project. The exposure assessment shall be updated to reflect actual conditions based on the results of exposure monitoring.

SD-04 Drawings

Site Layout; GA.

Descriptions, detail project drawings, site layout to include work site containment area techniques as prescribed on SET-UP DETAIL SHEETS, local exhaust ventilation system locations, decontamination and load-out units, other temporary waste storage facility, access tunnels, location of temporary utilities electrical, water, sewer and boundaries of each asbestos regulated work area.

SD-08 Statements

Qualification; GA.

A written qualifications and organization report providing evidence of qualifications of the Contractor, Contractor's onsite supervisor (competent person), Contractor workers, all subcontractors (to include disposal transportation and disposal facility firms), subcontractor supervisors, subcontractor workers, independent IH firm, independent testing laboratory, and testing laboratory analysts, to perform asbestos abatement activities as required herein. The report shall specify the Contractor's staff organization to include subcontractors, independent IH firm and testing laboratory chain of command to be used for this project. The report shall be signed by the Contractor and the principals of all subcontractor, independent IH and testing laboratory firms and certify that all firms and personnel involved in the asbestos abatement project fully understand the contents of CFR 29 Part 1926, CFR 40 Part 61, Subparts M, and the Federal, state and local requirements specified in paragraph SAFETY AND HEALTH COMPLIANCE. The Contractor's qualification report shall contain information required below:

a. Evidence that Contractor's full-time onsite supervisor is designated as, and is qualified to be a "competent person" in accordance with CFR 29 Part 1926 and is experienced in the administration and supervision of asbestos abatement projects, including initial exposure assessments, work practices, abatement methods, protective measures for personnel, inspection of asbestos abatement work areas, evaluating the integrity of containment barriers, placement and operation of local exhaust systems, ACM generated waste containment and disposal procedures, decontamination units installation and maintenance requirements,

site safety and health requirements, etc. This designated "competent person" onsite supervisor shall be responsible for compliance with applicable Federal, state and local requirements, the Contractor's SHP and APP and the Asbestos Hazard Abatement Plan. The Contractor shall submit evidence that this person has a minimum of [2] [_____] years of on-the-job asbestos abatement supervisory experience.

b. The name, address and telephone number of each independent testing laboratory selected to perform the sample analyses and report the results. The testing laboratory shall be completely independent from the Contractor as recognized by Federal, state or local regulations. For each laboratory selected to conduct phase contrast microscopy (PCM) of airborne samples using the methods specified by CFR 29 Part 1926 and NIOSH Pub No. 84-100 Method 7400; transmission electron microscopy (TEM) of airborne samples using the methods specified by NIOSH Pub No. 84-100 Method 7402 (TEM confirmation of asbestos content of PCM results) [and] [TEM Mandatory Method specified by CFR 40 Part 763] [and] [bulk sample analysis of suspect ACM as required by CFR 40 Part 61, Subpart M] written verification of the following criteria, signed by the Testing Laboratory principal and the Contractor shall be submitted:

(1) The laboratory is proficient in conducting phase contrast microscopy (PCM) of airborne samples using the methods specified by CFR 29 Part 1926.1101, OSHA method ID-160, the most current version of NIOSH-01 Method 7400, and transmission electron microscopy (TEM) Method 7402. The laboratory is currently judged proficient in counting airborne asbestos samples by PCM by successful participation within the past year in the American Industrial Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program.

(2) The name of each selected microscopist who will analyze airborne samples by PCM with substantiating verification that such person possesses the demonstrated proficiency to conduct PCM analysis by; being judged proficient in counting samples as a current participating analyst in the AIHA PAT Program, and having successfully completed the Asbestos Sampling and Analysis course (NIOSH 582 or equivalent; a copy of course completion certificate is required). When the PCM analysis is to be conducted onsite, the following additional information is required: written documentation certifying that the onsite analyst has been judged proficient in counting samples as a current participating analyst in the AIHA PAT program, written documentation and course completion certificate certifying successful completion of the Asbestos Samplling and Analysis Course (NIOSH 582 or equivalent), and the name, address and telephone number of an independent testing laboratory which will perform sample analyses and report the results of at least five (5%) of all samples and 100% of all clearance samples meeting the requirements of (1) above.

(3) The laboratory is fully equipped and each analyst possesses demonstrated proficiency to confirm NIOSH Pub No. 84-100 Method 7400 PCM sample analyses results from the same filter by conducting NIOSH Pub No. 84-100 Method 7402 TEM analyses.

(4) The laboratory is fully equipped to conduct polarized light microscopy (PLM) analysis of suspect ACM bulk samples in

accordance with [CFR 40 Part Part 763, Appendix A to Subpart F], [OSHA Method ID 191] [EPA Method \600\R-93\116 "Method of Determination of Asbestos in Bulk Material Ref Id and the laboratory is currently accredited by the National Institute for Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) for bulk asbestos analysis and will use analysts (provide name(s)) with demonstrated proficiency to conduct PLM to include its application to the identification and quantification of asbestos content.

[(5) The laboratory is fully equipped to conduct TEM analysis of airborne samples using the mandatory method specified by CFR 40 Part 763, the laboratory is currently accredited by NIST under NVLAP for airborne sample analysis of asbestos by TEM, the laboratory will use analyst(s) (provide name(s)) that are currently evaluated as competent with demonstrated proficiency under the NIST NVLAP for airborne sample analysis of asbestos by TEM.]

Designated Industrial Hygienist Qualifications; GA.

The name, address, telephone number, and resume of the Industrial Hygienist (IH) selected to prepare the Contractor's Asbestos Hazard Abatement Plan, prepare and perform training, direct air monitoring and assist the Contractor's competent person supervisor in implementing and ensuring safety and health requirements are complied with during the performance of all required work. The IH shall be a person who is [board certified in the comprehensive or specialized practice of industrial hygiene] [or] [board eligible (meets all education and experience requirements)] as determined and documented by the American Board of Industrial Hygiene (ABIH), and has a minimum of [2] [_____] years of comprehensive experience in planning and overseeing asbestos abatement activities. The IH shall submit evidence of comletion of an Asbestos Supervisor [and] [Asbestos Project Design] course [s] and subsequent refresher training.The IH shall be completely independent from the Contractor and shall not be an employee of the Contractor or be an employee or principal of a firm recognized by Federal, state, or local regulations that would constitute a business relationship that would not be considered independent. A copy of the IH's [current valid ABIH Certification] [current valid ABIH confirmation of eligibility in writing from the ABIH] shall be included. In addition, the designated IH shall prepare and the Contractor shall submit the name, address, telephone numbers and resumes of additional IH's and industrial hygiene technicians (IHT) who will be assisting the designated IH in performing onsite tasks. IHs and IHTs supporting the designated IH shall completedan Asbedstos Contractor/Supervisor coursehave a minimum of [2] [_____] full years of practical onsite asbestos abatement experience. The formal reporting relationship between the designated IH and the support IHs and IHTs, the Contractor's competent person, and the Contractor shall be indicated. The resume of each designated IH shall be signed by the designated IH and Contractor. The resume of each designated IH's support IH and IHT staff shall be signed by the individual for whom the resume was prepared and the designated IH.

Landfill and Transporter Qualifications; GA.

Written evidence that the landfill for disposal is approved for asbestos disposal by the [USEPA] [and] [state] [and] [local] regulatory agencies. Copies of signed agreements between the Contractor, and each subcontractor to include transporters and the asbestos waste disposal facility to accept

and dispose of all asbestos containing waste generated during the performance of this contract. Qualification resumes of each subcontractor transporter to be used, indicating previous experience in transport and disposal of asbestos waste to include all required state and local waste hauler requirements for asbestos.

Employee Training and Certification of Worker Acknowledgment; GA.

The following training documentation for each employee to be engaged in the abatement work :

a. Copy of certification of accreditation for completion of "workers" course (for workers) or "Contractor/Supervisor" Course (for Contractors and onsite supervisory staff) meeting the requirements of EPA's CFR 40 Part 763 or more stringent state criteria, and all subsequent annual refresher training certificates meeting same requirements.

b. A copy of a Contractor generated form entitled Certificate of Workers Acknowledgment shall be completed for each employee in the same format and containing the same information as the example certificate appended to this section.

Training Material; FIO.

A copy of the written project site-specific training material as indicated in CFR 29 Part 1926, Section 1926.58 that will be used to train all on-site employees. This training document shall be signed by the Contractor's IH and competent person supervisor.

Certification of Medical Requirements; GA.

For each worker, a written medical opinion prepared and signed by a licensed physician indicating the following:

a. Summary of the results of the examination.

b. The potential for an existing physiological condition that would place the employee at an increased risk of health impairment from exposure to asbestos.

c. The ability of the individual to wear personal protective equipment including respirators while performing strenuous work tasks under cold stress and/or heat stress conditions.

d. A statement that the employee has been informed of the results of the examination, been provided a copy of the results, informed of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure, and informed of any medical condition that may result from asbestos exposure.

Encapsulants; [_____].

Certificates stating that encapsulants meet the applicable specified performance requirements.

SD-09 Reports

Negative Exposure Assessment;

GA.

The Contractor may demonstrate that employee exposures will be below the PELs by data which conform to the following criteria:

a. Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers ini concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or

b. Where the Contractor has monitored prior asbestos jobs for the PEL and the excursion limit within 12 months of the current or projected job, the monitoring and analhysis were performed in compliance with CFR 29 Part 1926.1101; and the data were obtained during work operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in the Contractor's current operations, the operations were conducted by employees whose training and experience were no more extensive than that of employees performing the current job, and these data show that under the conditoins prevailing and which will prevail in the current workplace there is a high degree of certainty that employee exposures will not exceed the TWA and excursion limit; or

c. The results of initial exposure monitoring of the current job made from breathing zone samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering the operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

Field Tests; FIO.

a. Air sampling reports.

b. Pressure differential recording local exhaust system.

c. Asbestos disposal waste disposal record report.

Air Sampling Results; GA.

Air sample fiber counting shall be completed and results provided within [24] [_____] hours after completion of a sampling period. The Contracting Officer shall be notified immediately of any airborne levels of asbestos fibers in excess of established requirements. Written sampling results shall be provided within 5 working days of the date of collection. The written results shall be signed by testing laboratory analyst, testing laboratory principal, the Contractor's IH and the [Contractor] [Contracting Officer's IH]. The air sampling results shall be documented on a Contractor's daily air monitoring log. The daily air monitoring log shall contain the following information for each sample: date sample collected, date sample analyzed, sample number, sample type (P = Personal, A = Area, C = Abatement Clearance, IRWA = Inside regulated work area, ORWA = Outside regulated work area, DU = Decontamination Unit, LOU = Load-out unit, AT = Access Tunnel), sample period (start time, stop time, elapsed time (minutes), sampling pump manufacturer - model and serial number, average flow rate (liters per minute (L/min)), total air volume sampled (liters (L)), sample results (fibers per cubic centimeter (f/cc)) [and] [structures per square millimeter (s/mm square)], and location/activity/name where sample collected. In addition, the daily log shall identify the

calibration method used to calibrate the sampling pumps, the name and location of the laboratory conducting the sample analyses, print name, signature, and date block for the industrial hygienist who conducted the sampling and the review verifying the accuracy of the information.

Pressure Differential Recordings FIO.

Pressure differential recordings shall be provided daily on the same day collected. Readings shall be reviewed by the Contractor's competent person supervisor and/or IH prior to submittal. Contracting Officer shall be notified immediately of any variance in the pressure differential which could cause adjacent unsealed areas to have asbestos fiber concentrations in excess of 0.005 fiber per cubic centimeter (f/cc) or background, whichever is higher.

Notifications; GA.

Contracting Officer shall be notified in writing 10 days prior to the start of asbestos work. Local fire department shall be notified 3 days before fire-proofing material is removed from a building and the notice shall specify when the material contains asbestos. A copy of the written notification shall be provided to any rental company concerning the intended use of rental equipment and the possibility of asbestos contamination, the decontamination procedures that will be used prior to the return of the equipment. A copy of the rental company's written acknowledgment and agreement shall be included in the submittal.

SD-13 Certificates

Vacuum, Filtration and Ventilation Equipment; FIO.

Manufacturer's certifications showing compliance with ANSI Z9.2 for:

a. Vacuums.

b. Water filtration equipment.

c. Ventilation equipment.

d. Other equipment required to contain airborne asbestos fibers.

SD-18 Records

Respirator Program; GA.

Records of the respirator program as required by ANSI Z88.2, CFR 29 Part 1910, Section 1910.134, CFR 29 Part 1926, Section 1926.58.

Asbestos Waste Shipment; GA.

Final completed copies of the Waste Shipment Record for all shipments of waste material as specified in CFR 40 Part 61, Subpart M and other required state waste manifest shipment records as specified herein. Detailed information of all asbestos waste disposals on the "MANDATORY WASTE SHIPMENT RECORD" form in accordance with revised CFR 40 Part 61, Subpart M. Such completed forms signed and dated by the agent of the landfill shall be submitted within 3 days after date of delivery of ACM to the landfill.

1.13 PERSONAL PROTECTIVE EQUIPMENT

[Three] [_____] complete sets of personal protective equipment shall be made available to the Contracting Officer and authorized visitors for entry to the asbestos regulated work area at all times for inspection of the asbestos regulated work area. Contracting Officer and authorized visitors shall be provided with training equivalent to that provided to Contractor employees in the selection, fitting, and use of the required personal protective equipment and the site safety and health requirements. Contractor workers shall be provided with personal protective clothing and equipment as specified herein and the Contractor shall ensure that it is worn properly. The Contractor's Industrial Hygienist and designated competent person supervisor shall select and approve all the required personal protective clothing and equipment to be used.

1.13.1 Respirators

General: The Contractor shall provide respirators and ensure that thehy are used as required by 1926.1101. Respirators shall be used in the following circumstances:

a. During all Class I asbestos jobs.
[b. During all Class II work where the ACM is not removed in a substantially intact state.]
[c. During all Class II and III work which is not performed using wet methods.]
[d. During all Class II and III asbestos jobs where the Contractor does not produce a "negative exposure assessment"]
e. During all Class III jobs where TSI or surfacing ACM is being disturbed.]
f. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
g. During all work where employees are exposed above the TWA or excursion limit.

Respirator Selection:

Where respirators are used, the Contractor shall select and provide, at no cost to the employee, the appropriate respirator as specified in Setup Detail Sheet 14, and shall ensure that the employee uses the respirator provided.

The Contractor shall select respirators from among those jointly approved as being acceptable for protection by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR 11.

The Contractor shall provide a tight-fitting powered, air-purifying respirator in lieu of any negative-pressure respirator specified in Setup Detail Sheet 14 whenever:

a. An employee chooses to use this type of respirator, and
b. This respirator will provide adequate protection to the employee.

In addition to the above selection criterion, the Contractor shall provide a half-mask air purifying respirator, other than a disposable

respirator, equipped with high-efficiency filters whenever the employee performs the following activities: Class II and III asbestos jobs where the Contractor does not produce a negative exposure assessment; and Class III jobs where TSI or surfacing ACM is being disturbed.

In addition to the above selection criteria, the Contractor shall provide a full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus for all employees within the regulated area where Class I work is being performed for which a negative exposure assessment has not been produced.

The upgrading or downgrading of respirator type, from the minimum requirements specified for start-up, shall be made by the Contractor's IH based on the monitoring results or initial exposure assessment. All recommendations made by the Contractor's IH to downgrade respirator type shall be submitted in writing to the Contracting Officer for acceptance.

Respirator Program:

Where respiratory protection is used, the Contractor shall institute a respirator program in accordance with CFR 29 Part 1910.134.

The Contractor shall permit each employee who uses a fillter respirator to change the filter elements whenever an increase in breathing resistance is detected and shall maintain an adequate supply of filter elements for this purpose.

Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

Respirator Fit Testing:

The Contractor shall ensure that the respirator issued to the employee exhibits the least ossible facepiece leakage and that the respirator is fitted properly.

The Contractor shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every 6 months thereafter for each employee wearing a negative-pressure respirator. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, or of full-facepiece air purifying respirators where they are worn at levels at which hald-facepiece air purifying respirators are permitted. A qualitative or quantitative fit test conforming to CFR 29 Part 1926, Appendix C shall be conducted by the Contractor's IH for each Contractor worker required to wear a respirator, and for the Contracting Officer and authorized visitors who enter an asbestos regulated work area where respirators are required to be worn.

1.13.2 Whole Body Protection

Personnel exposed to asbestos shall be provided with whole body protection as specified herein and such protection shall be worn properly. The Contractor's IH and competent person supervisor shall select and approve the whole body protection to be used. The competent person shall examine

worksuits worn by employees at least once per workshift for rips or tears that may occur during performance of work. When rips or tears are detected while an employoee is working, rips and tears shall be immediately mended, or the worksuit shall be immediately replaced. Disposable whole body protection shall be disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area. Reusable whole body protection worn shall be either disposed of as asbestos contaminated waste upon exiting from the asbestos regulated work area or be properly laundered in accordance with CFR 29 Part 1926 and as specified in the Contractor's Asbestos Hazard Abatement Plan. Asbestos abatement whole body protection shall not be removed from the work site by a worker to be cleaned.

1.13.2.1 Coveralls

[Disposable-impermeable] [Disposable - breathable] [Reusable] coveralls with a zipper front shall be provided. Sleeves shall be secured at the wrists, and foot coverings secured at the ankles. See DETAIL SHEET 13.

1.13.2.2 Gloves

Gloves shall be provided to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort, but shall not be used alone. [Where there is the potential for hand injuries (i.e., scrapes, punctures, cuts, etc.) an appropriate glove shall be provided and used.]

[1.13.2.4 Work Clothing

An additional coverall similar to that required in paragraph Coveralls shall be provided when the abatement and control method employed does not provide for the exit from the asbestos regulated work area directly into an attached decontamination unit. Cloth work clothes shall be provided for wear under the protective coverall and foot coverings when work is being conducted in low temperature conditions. Cloth work clothes shall be either disposed of as asbestos contaminated material or properly laundered in accordance with CFR 29 Part 1926 and as specified in the Contractor's Asbestos Hazard Abatement Plan.]

1.13.2.5 Foot Coverings

Cloth socks shall be provided and worn next to the skin. If rubber boots are not used, foot wear and disposable foot coverings shall be provided. Rubber boots shall be used in moist or wet areas. Only rubber boots shall be removed from the asbestos regulated work area after being thoroughly decontaminated. All other protective foot covering shall be disposed of as ACM.

1.13.2.6 Head Covering

Hood type [disposable] [reusable] head covering shall be provided. In addition, protective head gear (hard hats) shall be provided as required. Hard hats shall only be removed from the asbestos regulated work area after being thoroughly decontaminated.

1.13.2.7 Protective Eye Wear

Contact lenses shall not be worn in asbestos regulated work areas. When vision correction is necessary to perform the work task, prescription safety eye wear shall be used. Fog-proof goggles shall be worn by personnel engaged in asbestos abatement activities in the asbestos

regulated work area when the use of a full face-piece respirator is not required. Eye protection provided shall be in accordance with ANSI Z87.1.

1.13.2.8 Other Items

All other items of whole body protection shall be provided as required and approved by the Contractor's IH.

1.14 DECONTAMINATION UNIT AND LOAD OUT UNIT AND ACCESS TUNNEL

The Contractor shall establish a decontamination area [that is adjacent and connected to the regulated area] for the decontamination of such employees. The decontamination area shall consist of an equipment room shower area, and clean room in series as described in DETAIL SHEET Numbers 22 and 23 [and] [20] [and] [25] appended herein. Utilization of prefabricated units shall have prior approval of the Contracting Officer. The Contractor shall ensure that employees enter and exit the regulated area through the decontamination area. The equipment room shall be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective equipment (See Setup Detail Sheets 9 and 14). The decontamination unit shall have a separate equipment locker room and a clean locker room with a shower that complies with CFR 29 Part 1910, Section 1910.141 in between. Two separate lockers shall be provided for each asbestos worker, one in each locker room. Street clothing and street shoes shall be kept in the clean locker. Upon exiting from the asbestos regulated work area to the equipment room, respirators shall be worn while asbestos contaminated protective clothing is HEPA-vacuumed, removed, and placed in approved labeled containers (see DETAIL SHEETS 9 and 14) for disposal [and] [or] [laundering]. Workers shall shower before changing into street clothes. Used shower water shall be collected and filtered to remove asbestos contamination. Filters and residue shall be disposed of as asbestos contaminated material; see DETAIL SHEETS 9 and 14. Filtered water shall be discharged to the sanitary system. Decontamination [and] [load-out] unit shall be attached in a leak-tight manner to each asbestos regulated work area. [Hot water service may be secured from the building hot water system provided back flow protection is installed by the Contractor at the point of connection.] [Should sufficient hot water be unavailable, the Contractor shall provide a minimum 150 liters 40 gallon electric hot water heater with minimum recovery rate of 75 liters 20 gallons per hour and a temperature controller for each showerhead.] The Contractor shall provide a minimum of [2] [_____] showers. Instantaneous type in-line water heater may be incorporated at each shower head in lieu of hot water heater upon approval by the Contracting Officer. Flow and temperature controls shall be located within the shower and be adjustable by the user. The waste water pump shall be sized for 1.25 times the showerheads' flow-rate at a pressure head sufficient to satisfy the filter head loss and discharge line losses. The pump shall supply a minimum 1.6 liters per second 25 gallons per minute flow with 11 m. 35 ft. of pressure head. Waste water filters shall be installed in series with the first stage pore size of 20 micrometer microns and the second stage pore size of 5 micrometer. microns. The floor of the decontamination unit's clean room shall be kept dry and clean at all times. Water from the shower shall not be allowed to wet the floor in the clean room. Surfaces of the clean room and shower shall be wet-wiped 2 times after each shift change with a disinfectant solution. Proper housekeeping and hygiene requirements shall be maintained. Soap and towels shall be provided for showering, washing and drying. Any cloth towels provided shall be disposed of as ACM waste or be laundered in accordance with CFR 29 Part 1926 and the Contractor's Asbestos Hazard Abatement Plan. Surfaces of the equipment room shall be wet-wiped 2 times after each shift change. [Surfaces of the Load-Out-Unit and access tunnel shall be adequately

wet-wiped 2 times after each shift change.] Materials used for wet wiping shall be disposed of as asbestos contaminated waste.

1.15 WARNING SIGNS AND TAPE

Contractor shall ensure that all personnel understand the warning signs. Warning signs and tape printed in [English] [English and [_____]] shall be provided at the regulated boundaries and entrances to asbestos regulated work areas. Signs shall be located at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Warning signs as shown and described in DETAIL SHEET 11 appended herein shall be in vertical format conforming to CFR 29 Part 1910, and CFR 29 Part 1926, minimum 500 by 360 mm 20 by 14 inches and displaying the following legend in the lower panel:

Legend	Lettering
Danger	76 mm (3-inch) Sans Serif Gothic or Block
Asbestos	25 mm (1-inch) Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	25 mm (1-inch) Sans Serif Gothic or Block
Authorized Personnel Only	25 mm (1-inch) Sans Serif Gothic or Block
Authorized Personnel Only	25 mm (1-inch) Gothic
Respirators and Protective Clothing are Required in this Area	25 mm (1-inch) Gothic

Legend	Lettering
Danger	3-inch Sans Serif Gothic or Block
Asbestos	1-inch Sans Serif Gothic or Block
Cancer and Lung Disease Hazard	1-inch Sans Serif Gothic or Block
Authorized Personnel Only	1-inch Sans Serif Gothic or Block
Authorized Personnel Only	1-inch Gothic
Respirators and Protective Clothing are Required in this Area	1-inch Gothic

Spacing between lines shall be at least equal to the height of the upper of any two lines. Warning tape shall be provided as shown and described on DETAIL SHEET 11, appended herein. Decontamination unit signage shall be as shown and described on DETAIL SHEET 15, appended herein.

1.16 WARNING LABELS

Warning labels shall be affixed to all asbestos disposal containers used to contain asbestos materials, scrap, waste debris, and other products contaminated with asbestos. Containers with preprinted warning labels conforming to requirements specified herein are acceptable. Warning labels shall be as described in DETAIL SHEET 14 appended herein, shall conform to CFR 29 Part 1926 and shall be of sufficient size to be clearly legible displaying the following legend:

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

1.17 LOCAL EXHAUST SYSTEM

A local exhaust system shall be provided in the asbestos regulated work area as described in DETAIL SHEET 8, appended herein and in accordance with ANSI Z9.2 and CFR 29 Part 1926. The system will provide at least 4 air changes per hour inside of the containment. The local exhaust system shall be operated 24 hours per day, until the asbestos regulated containment area is removed and shall be leak proof to the filter and equipped with HEPA filters. Local exhaust equipment shall be sufficient to maintain a minimum pressure differential of minus 0.51 mm (0.02 inch)0.02 inch of water column relative to adjacent, unsealed areas. Pressure differential shall be monitored continuously, 24 hours per day, with an automatic recording instrument. In no case shall the building ventilation system be used as the local exhaust system for the asbestos regulated work area. Filters on local exhaust system equipment shall conform to ANSI Z9.2 and UL 586. Filter shall be UL labeled. The local exhaust system shall terminate out of doors. All filters used shall be new at the beginning of the project and shall be periodically changed as necessary and disposed of as ACM waste.

1.18 TOOLS

Vacuums shall be leak proof to the filter, equipped with HEPA filters, be of sufficient capacity and provide the necessary capture velocity at the nozzle or nozzle attachment to efficiently collect, transport and retain the ACM waste material. Power tools shall not be used to remove ACM unless the tool is equipped with effective, integral HEPA filtered exhaust ventilation capture and collection system or has otherwise been approved for use by the Contracting Officer. All residual asbestos shall be removed from reusable tools prior to storage and reuse. Reusable tools shall be thoroughly decontaminated prior to being removed from asbestos regulated work areas.

1.19 RENTAL EQUIPMENT

If rental equipment is to be used, written notification shall be provided to the rental agency, concerning the intended use of the equipment, the possibility of asbestos contamination of the equipment and the steps that will be taken to decontaminate such equipment. A written acceptance of the terms of the Contractor's notification shall be obtained from the rental agency.

1.20 AIR MONITORING EQUIPMENT

The Contractor's IH shall select and approve the air monitoring equipment to be provided and used by the Contractor for evaluation of airborne asbestos fiber concentrations. The equipment shall include, but not be limited to:

a. High-volume sampling pumps that can be calibrated and operated at a constant airflow up to approximately 10 liters per minute when equipped with a sampling train of tubing and filter cassette,

b. Low-volume, battery powered, body-attachable, portable personal pumps that can be calibrated to a constant airflow up to approximately 3.5 liters per minute when equipped with a sampling train of tubing and filter cassette, and a self-contained rechargeable power pack capable of sustaining the calibrated flow rate for a minimum of 10 hours. The pumps shall also be equipped with an automatic flow control unit which shall maintain a constant flow even as filter resistance increases due to accumulation of fiber and debris on the filter surface,

c. Standard 25 millimeter diameter, 0.8 micrometer micron pore size, mixed cellulose ester membrane filters and cassettes with nonconductive barrels and shrink bands, to be used with low flow pumps in accordance with CFR 29 Part 1926, for personal air sampling,

d. Standard 25 millimeter diameter, 0.45 micrometer micronpore size, mixed cellulose ester membrane filters and cassettes with non-conductive barrels and shrink bands, to be used with high flow pumps when conducting environmental area sampling using NIOSH Pub No. 84-100 Methods 7400 and 7402 and the transmission electric microscopy method specified at CFR 40 Part 763,

e. Appropriate plastic tubing to connect the air sampling pump to the selected filter cassette,

f. A flow calibrator capable of calibration to within plus or minus 2 percent of reading over a temperature range of minus 20 degrees C (minus 4 degrees F) minus 4 degrees Fahrenheit to plus 60 degrees C (140 degrees F) 140 degrees Fahrenheit and traceable to a National Institute for Standards and Technology (NIST) primary standard.

1.21 EXPENDABLE SUPPLIES

1.21.1 Glove Bag

Glove bags shall be provided as described in CFR 29 Part 1926 and DETAIL SHEET 10, appended herein. The glove bag assembly shall be prefabricated with preprinted OSHA warning label and shall typically be constructed of 0.152 mm (6 mil) 6 mil thick transparent polyethylene or polyvinyl chloride sheeting and at least two inward projecting long sleeves and an internal pouch. The glove bag shall be constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. The glove bag shall have sufficient capacity to hold removed materials and permit leak-tight sealing.

1.21.2 Duct Tape

Industrial grade duct tape shall be provided in 50 mm 2 inch and 76 mm 3 inch widths and shall be suitable for bonding sheet plastic and disposal containers specified herein.

1.21.3 Disposal Containers

Leak-tight disposal containers shall be provided for ACM generated wastes as described in DETAIL SHEETS 9A, 9B, 9C and 14 and as specified herein. Leak-tight means that solids, liquids or dust cannot escape or spill out. All disposal containers shall be either pre-labeled or affixed with OSHA warning label as specified in CFR 29 Part 1926.

1.21.4 Disposal Bags

One hundred fifty two thousandths millimeter (6 mil) Six-mil thick leak-tight pre-labeled (OSHA warning label) bags shall be provided for placement of asbestos generated waste as described in DETAIL SHEET 9A.

1.21.5 Leak-tight Wrapping

Two layers of 0.152 mm (6 mil) 6 mil (minimum) thick polyethylene sheet stock shall be used for the containment of removed asbestos-containing components or materials such as reactor vessels, large tanks, boilers, insulated pipe segments and other materials too large to be placed in disposal bags as described in DETAIL SHEET 9B. Upon placement of the ACM component or material, each layer shall be individually leak-tight sealed with duct tape.

1.21.6 Fiberboard Drums

Fiberboard drums shall be provided if required by state or local requirements.

1.21.7 Cardboard Boxes

Heavy-duty corrugated cardboard boxes coated with plastic or wax to retard deterioration from moisture shall be provided as described in DETAIL SHEET 9C if required by state and local requirements. Boxes shall fit into selected ACM disposal bags. Filled boxes shall be sealed leak-tight with duct tape.

1.21.8 Sheet Plastic

Sheet plastic shall be provided as specified herein and in the largest sheet size necessary to minimize seams, as indicated on the project drawings.

1.21.8.1 Polyethylene Sheet - General

One hundred fifty two thousandths millimeter (6 mil) Six-mil(minimum) thick polyethylene film shall be [clear] [frosted] [or] [black] and conform to ASTM D 4397.

1.21.8.2 Polyethylene Sheet - Flame Resistant

Where a potential for fire exists, 0.152 mm (6-mil) 6-mil (minimum) thick flame-resistant polyethylene sheet shall be provided. Flame-resistant

polyethylene film shall be [frosted] [or] [black] and shall conform to the requirements of NFPA 701.

1.21.8.3 Polyethylene Sheet-Reinforced

One hundred fifty two thousandths millimeters (6-mil) Six-mil thick reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the asbestos regulated work area and the outdoor environment. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

1.21.8.4 Viewing Inspection Window

Where feasible, a minimum of one clear 3.2 mm (1/8-inch) 1/8-inchthick acrylic sheet, 450 mm by 600 mm, 18 inches by 24 inches,shall be installed as a viewing inspection window at eye level on a wall in each containment enclosure. All such windows shall be sealed leak-tight with industrial grade duct tape.

1.21.9 Wetting Agents

1.21.9.1 Amended Water

Amended water shall meet the requirements of ASTM D 1331.

1.21.9.2 Removal Encapsulant

Removal encapsulant (a penetrating encapsulant) shall be provided when conducting removal abatement activities that require a longer removal time or are subject to rapid evaporation of amended water. The removal encapsulant shall be capable of wetting the ACM and retarding fiber release during disturbance of the ACM equal to or greater than provided by amended water. Performance requirements for penetrating encapsulants are specified in paragraph ENCAPSULANTS.

1.21.10 Strippable Coating

Strippable coating in aerosol cans shall be used to adhere to surfaces and to be removed cleanly by stripping at the completion of work. Since these coatings have a hydrocarbon carrying agent, their use shall be confined to well ventilated areas.

1.22 MATERIAL SAFETY DATA SHEETS

Material safety data sheets (MSDSs) shall be provided for all hazardous materials brought onto the work-site. One copy shall be provided to the Contracting Officer's onsite Representative and one copy shall be included in the Contractor's Hazard Communication Program.

1.23 OTHER ITEMS

A sufficient quantity of other items shall be provided that may include, but not be limited to: scrapers, brushes, brooms, staple guns, tarpaulins, shovels, rubber squeegees, dust pans, other tools, scaffolding, staging, enclosed chutes, wooden ladders, lumber necessary for the construction of asbestos regulated containment work areas, UL approved temporary electrical equipment, material and chords, ground fault circuit interrupters, water

hoses of sufficient length, fire extinguishers, first aid kits, portable toilets, logbooks, log forms, markers with indelible ink, spray paint in bright color to mark areas, project boundary fencing, etc.

1.24 PRECONSTRUCTION CONFERENCE

The Contractor, the Contractor's designated onsite "competent person," supervisor and Contractor's IH shall meet with the Contracting Officer prior to beginning work at a safety preconstruction conference to discuss the details of the Contractor's Asbestos Hazard Abatement Plan, SHP and APP including work procedures and safety precautions. Once accepted by the Contracting Officer, the Asbestos Hazard Abatement Plan, the SHP and APP will be enforced as if an addition to the specification. Any changes required in the specification as a result of the Asbestos Hazard Abatement Plan shall be identified specifically in the plan to allow for free discussion and acceptance by the Contracting Officer prior to the start of work.

PART 2 PRODUCTS

2.1 ENCAPSULANTS

Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent and shall meet the following requirements:

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeance - Minimum 2.288 by 10E - 8 grams per Pascal per second per square meter (0.4 perms)	ASTM E 96

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 2394 Pa (50 psf)	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 0.495 kg meters	ASTM D 2794

ALL ENCAPSULANTS

Requirement	Test Standard
(43 inch pounds)	Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 2394 Pa (150 psf) 50 pounds of force/square foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 0.495 kg meters (43 inch pounds) 43 inch pounds	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Lock-Down Encapsulant

Requirement	Test Standard
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength; 4788 kPa (100 psf)	ASTM E 736
(Tests compatibility with cementitious and fibrous fireproofing)	

ALL ENCAPSULANTS

Requirement	Test Standard
Flame Spread - 25, Smoke Emission - 50	ASTM E 84
Combustion Toxicity Zero Mortality	University of Pittsburgh Protocol

ALL ENCAPSULANTS

Requirement	Test Standard
Life Expectancy - 20 years	ASTM C 732 Accelerated Aging Test
Permeability - Minimum 0.4 perms	ASTM E 96

Additional Requirements for Bridging Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 50 pounds of force/square foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 43 in/lb	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Penetrating Encapsulant

Requirement	Test Standard
Cohesion/Adhesion Test - 50 pounds of force/square foot	ASTM E 736
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Classified by UL for use over fibrous and cementitious sprayed fireproofing)	ASTM E 119
Impact Resistance - Minimum 43 in/lb	ASTM D 2794 Gardner Impact Test
Flexibility - no rupture or cracking	ASTM D 522 Mandrel Bend Test

Additional Requirement for Lock-Down Encapsulant

Requirement	Test Standard

ALL ENCAPSULANTS

Requirement	Test Standard
Fire Resistance - Negligible affect on fire resistance rating over 3 hour test (Tested with fireproofing over encapsulant applied directly to steel member)	ASTM E 119
Bond Strength; 100 pounds, force/foot (Tests compatibility with cementitious and fibrous fireproofing)	ASTM E 736

2.2 ENCASEMENT PRODUCTS

Primary cellular polymer coat, polymer finish coat and any other finish coat as approved by the Contracting Officer.

PART 3 EXECUTION

3.1 GENERAL

Asbestos abatement work tasks as shown on the detailed plans and drawings as summarized in paragraph DESCRIPTION OF WORK and Table 1, shall be performed as specified herein to include the appended Asbestos Abatement DETAIL SHEETS. Personnel shall wear and utilize protective clothing and equipment as specified herein. Eating, smoking, drinking, or applying cosmetics shall not be permitted in the asbestos regulated work area. All hot work (burning, cutting, welding, etc.) shall be conducted under strictly controlled conditions in conformance with CFR 29 Part 1926. Personnel of other trades not engaged in asbestos abatement activities shall not be exposed at any time to airborne concentrations of asbestos unless all the administrative and personal protective provisions as required herein are complied with. The building heating, ventilating, and air conditioning system shall be shut down, openings to the system capped, and temporary [heating] [and] [ventilation] [and] [air conditioning] provided prior to the commencement of abatement work. Electrical service shall be disconnected where necessary for wet removal. Temporary electrical service shall be provided where needed. If an asbestos spill occurs outside of the asbestos regulated work area, work shall be stopped and the Contracting Officer shall be notified. The condition shall be corrected to the satisfaction of the Contracting Officer including air sampling, prior to resumption of work. The Contractor shall stop abatement work in the asbestos regulated work area immediately when the measured airborne total fiber concentrations, as sampled and analyzed as required herein, (1) equals or exceeds 0.01 f/cc or the preabatement concentration, whichever is greater, - outside the asbestos regulated work area, or (2) equals or exceeds 1.0 f/cc inside the asbestos regulated work area. The Contractor shall correct the condition to the satisfaction of the Contracting Officer, including visual inspection and air samplings. Work resumption will only be allowed upon notification by the Contracting Officer. Corrective actions shall be documented.

3.2 PROTECTION OF ADJACENT WORK OR AREAS TO REMAIN

Asbestos abatement work shall be performed without damage or contamination of adjacent work or area. Where such work or area is damaged or

contaminated as verified by the Contracting Officer using visual inspection and/or sample analysis, it shall be restored to its original condition or decontaminated by the Contractor at no expense to the Government as deemed appropriate by the Contracting Officer. This includes inadvertent spill of dirt, dust or debris in which it is reasonable to conclude that asbestos may exist. When these spills occur, work shall stop in all effected areas immediately and the spill shall be cleaned. When satisfactory visual inspection and/or sampling analysis results are obtained and have been evaluated by the Contractor's IH and the Contracting Officer, work may proceed.

3.3 FURNISHINGS

3.3.1 Removal of Furnishings

[Furniture [_____] and equipment will be removed from the area of work by the Government before asbestos abatement work begins.] [DETAIL SHEET 27, appended herein contains a summary of Contractor's required handling, cleaning and storage and reinstallation of furniture and equipment located in each abatement area. Bids shall be based on decontaminating, handling and storage based on this summary and the paragraphs below.] [Furnishings identified in the appended DETAIL SHEET 27 are [not] considered contaminated with asbestos fibers. Furnishings shall be precleaned using HEPA filtered vacuum followed by wet wiping [and] [or] steam cleaning. These items shall be removed to an area or site designated on Sheet 27 and as identified by the Contracting Officer and stored or other appropriate action taken as identified on Sheet 27. Carpets, draperies, and other items which may not be suitable for onsite wet cleaning methods shall be [properly laundered in accordance with CFR 29 Part 1926 and the Contractor's Asbestos Hazard Abatement Plan] [disposed of as asbestos contaminated material].]

3.3.2 Furnishings to Remain in Place

Furniture, [_____], and equipment as shown on DETAIL SHEET 27, shall remain in place and shall be precleaned using HEPA vacuum followed by adequate wet wiping. Furnishings shall be covered with 2 layers of 0.152 mm (6-mil)6-mil polyethylene and edges sealed with duct tape.

3.3.3 Replacement of Furnishings

At the conclusion of the asbestos abatement work in each work area and after meeting the final clearance requirements for each work area, objects so removed shall be transferred back to the cleaned area from which they came in accordance with the storage code designation for that material as shown on DETAIL SHEET 27, and reinstalled.

3.4 BUILDING VENTILATION SYSTEM AND CRITICAL BARRIERS

Any building ventilating system supplying air into or returning air out of an asbestos regulated work area shall be shut down and isolated by lockable switch or other positive means in accordance with CFR 29 Part 1910, Section 1910.147, [to prevent accidental start-up] [and] [isolated by airtight seals to prevent] contaminant spread through the system. Air-tight critical barriers shall be installed on all building ventilating openings that supply, or return air from the building ventilation system or serves to exhaust air from the building, that are located inside the asbestos regulated work area. The critical barriers shall consist of [air-tight rigid covers for building ventilation supply and exhaust grills where the

ventilation system is required to remain in service during abatement] [1 layer] [2 layers] of 0.152 mm (6-mil) 6-milpolyethylene. Edges to wall, ceiling and floor surfaces shall be sealed with industrial grade duct tape. Critical barriers shall be installed as shown on drawings and appended SET-UP DETAIL SHEETS and as specified herein.

3.5 PRECLEANING

Surfaces shall be [cleaned by HEPA vacuum] [and] [adequately wet wiped] prior to establishment of containment.

3.6 ASBESTOS CONTROL AREA REQUIREMENTS

Regulated containment areas shall be established and maintained for each abatement work task as specified in SET-UP DETAIL SHEETS. Viewing inspection window shall be installed on the wall of the containment enclosure, as specified in paragraph Viewing Inspection. The following procedures shall be performed sequentially and each activity shall be completed before proceeding to the next. Various steps may be omitted for an individual containment area when that work is not specified on the drawings.

a. Furnishings in the asbestos regulated work area shall be cleaned, [protected in place] [removed] as specified on DETAIL SHEET 27 and further specified at paragraph FURNISHINGS.

b. Tools, scaffolding, staging, etc., necessary for the work shall be placed in the area to be isolated prior to erection of work area enclosed containment.

c. Building ventilating systems serving the work area shall be shutdown or isolated.

d. Power to the asbestos regulated work area shall be locked-out by switching off all breakers serving power or lighting to this area in accordance with CFR 29 Part 1910.

e. Surfaces shall be precleaned as required by paragraph PRECLEANING.

f. [Personnel Decontamination Unit shall be installed as specified and shown in SET-UP DETAIL SHEETS 22 and 23.] [Load-Out unit shall be installed as specified herein and in SET-UP DETAIL SHEET 20.]

g. Critical barriers shall be installed as required for building ventilation system.

h. Local exhaust ventilation system shall be installed as specified and shown on DETAIL SHEET 8.

i. Containment area shall be installed as required for each abatement task as specified and shown on the SET-UP DETAIL SHEETS.

3.7 CLEAN-UP

The Contractor shall maintain a clean work area by performing on a daily basis the following housekeeping functions at the end of each shift:

a. Loose ACM shall be prepared for disposal by packaging the waste

and removing it from the work area to the load-out area.

b. Work area shall be HEPA vacuumed.

c. Polyethylene in work and high traffic areas shall be inspected and repaired.

d. Containment area shall be wet wiped if air sample results exceed prescribed level.

3.8 GLOVE BAG

Asbestos regulated work areas shall be established as specified and shown on detailed drawings and plans for glove bag abatement. Designated boundary limits for the asbestos work shall be established with rope or other continuous barriers and all other requirements for asbestos control areas shall be maintained including area signage and boundary warning tape as specified in SET-UP DETAIL SHEET 11. Area monitoring of airborne asbestos fibers shall be conducted during the work shift at the designated boundary limits and personal air monitoring shall be performed for each worker engaged in asbestos handling (removal, disposal, transport and other associated work) at such frequency as specified in the Contractor's air monitoring plan. If the concentration of asbestos fibers monitored at the breathing zone of the workers or designated limits at any times exceeds 0.01 f/cc or the preabatement level, whichever is greater, work shall be stopped and the Contracting Officer shall be notified. The Contractor shall correct the condition to the satisfaction of the Contracting Officer to include visual inspection and air sampling. Work resumption will only be allowed upon notification by the Contracting Officer. If adjacent areas outside the regulated work area are contaminated, the Contractor at his expense, shall clean the contaminated area, visually inspect the cleaned area, and conduct air monitoring.

3.9 ASBESTOS HANDLING PROCEDURES

The Contractor shall employ proper handling procedures in accordance with CFR 29 Part 1926 and CFR 40 Part 61, Subpart M and the specification requirements herein. The specific abatement techniques and items identified shall be detailed in the Contractor's Asbestos Hazard Abatement Plan including but not limited to details of construction materials, equipment, and handling procedures. Following task descriptions include the appended drawings which detail the required abatement handling technique.

3.9.1 Removal of ACM From Interior Architectural System

After completion of all asbestos removal work, surfaces form which asbestos containing materials have been removed shall be wet wiped or sponged clean, or cleaned by some equivalent method to remove all visible residue. Run-off water shall be collected and filtered through the dual filtration system. A first filter shall be provided to remove fibers 20 micrometers and larger and a final filter provided that removes all fibers 5 micrometers and larger. After the gross amounts of asbestos have been removed form every surface, all remaining visible accumulations of asbestos on floors shall be collected using plastic shovels, rubber squeegees, rubber dustpans and HEPA vacuum cleaners as appropriate to maintain the integrity of the containment barrier. When all insulation has been removed, workmen shall use HEPA vacuum cleaners to vacuum every surface. Particular attention shall be paid to those surfaces or locations which

could harbor accumulations or residual asbestos dust including: [Pipe Fitting Insulation (using glove bag): See Sheet 94;] [Asbestos Cement Pipe: See Sheet 102;] [Asbestos Cement Ductwork: See Sheet 103;] [Asbestos Flex Connector: See Sheet 104].

Following interior ACM shall be removed:

[Troweled Wall Plaster on Masonry: See Sheet 32]
[Troweled Wall Plaster on Stud Wall: See Sheet 33]
[Troweled Ceiling Plaster on Structural Substrate: See Sheet 35]
[Troweled Ceiling Plaster on Hung Ceiling: See Sheet 36]
[Acoustical Wall Plaster on Masonry: See Sheet 42]
[Acoustical Ceiling Plaster (Non-Asbestos Substrate): See Sheet 44]
[Asbestos Decorative Paint on Plaster: See Sheet 46]
[Light Curtain: See Sheet 47]
[Interior Asbestos Cement, Fiberboard and Drywall Panels: See Sheet 48]
[Asbestos-contaminated Masonry for Masonry Chimney: See Sheet 50]
[Asbestos Contaminated Masonry Wall or Thermal Insulation: See Sheet 51]
[Suspended Asbestos Cement Ceiling Tile: See Sheet 52]
[Asbestos Cement Architectural Products: See Sheet 53]
[Glued-on Acoustical Ceiling and Wall Tile: See Sheet 55]
[Suspended Acoustical Ceiling Tile: See Sheet 54]
[Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos Containing Adhesive: See Sheet 57]
[Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos Free Adhesive: See Sheet 58]
[Vinyl Asbestos Tile and Chemical Dissolution of Asbestos-Containing Adhesives on Concrete Floor System: See Sheet 59]
[Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Containing Adhesive: See Sheet 61]
[Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Free Adhesive: See Sheet 62]
[Sheet Flooring Adhered Wood Floor System: See Sheet 63]
[Asbestos-Containing Sheet Flooring Adhered to Concrete Floor System by Asbestos-Containing Adhesive: See Sheet 64]
[Carpeting (Asbestos Containing or Contaminated): See Sheet 65]
[Fireproofing or Thermal Surface Insulation: See Sheet 68]
[Acoustical Ceiling Insulation: See Sheet 70]
[Miscellaneous Asbestos-Containing Materials: See Sheet 45]

3.9.2 Removal of ACM From Exterior Architectural Systems

Following exterior ACM shall be removed:

[Built Up Roofing and Flashing: See Sheet 74]
[Roof, Shingles and Underlayment: See Sheet 75]
[Exterior Asbestos Stucco: See Sheet 79]
[Asbestos Cement Siding: See Sheet 81]
[Asbestos Cement Roofing: See Sheet 82]
[Asbestos-Containing Walkway Cover: See Sheet 83]
[Asbestos-Contaminated Metal Siding: See Sheet 84]
[Asbestos Cement Sunscreen Louvers: See Sheet 85]
[Asbestos-Contaminated Masonry for Masonry Chimney: See Sheet 50]

3.9.3 Removal of ACM From Mechanical and Electrical Systems

Following Mechanical/Electrical components shall be removed:

[Electrical Wiring and Fixtures: See Sheet 95]

[Asbestos Insulated Electrical Fixture: See Sheet 96]
[Boiler Firebox Insulation: The asbestos-containing boiler firebox lining shall be removed from out-of-service boilers before the boiler is dismantled: See Sheet 97]
[Boiler and Piping Gaskets: See Sheet 99]
[Duct Insulation: Duct work insulation removal shall not begin without the written authorization of the Contracting Officer stating that the HVAC system to be worked on is either isolated or inoperative and locked out of service. No forced air circulation is permitted in ductwork while abatement work is in progress. See Sheet 101]
[Pipe Insulation (Using a Glove bag): See Sheet 87]
[Horizontal Pipe Insulation (Using a Containment area): See Sheet 88]
[Pipe Insulation (Using a Mini Containment Area): See Sheet 89]
[Storage Tank and Boiler Breeching Insulation: See Sheet 93
Written approval must be obtained from the Contracting Officer before start of work on tanks and boiler breeching. Contracting Officer will ensure that tanks and boilers have been valved off or shut down and allowed a sufficient amount of time to cool down. Insulation shall be sprayed with a mist of amended water or removal encapsulant. Amended water or removal encapsulant shall be allowed to saturate material to substrate. Bands or wires holding breeching or insulation to equipment shall be cut. Cover jackets shall be slit at seams, and sections removed and hand placed in a 0.152 mm (6-mil) 6-mil polyethylene disposable bag. Exposed surfaces shall be continuously sprayed with amended water to minimize airborne dust. Insulation on tanks and boiler breeching shall not be allowed to drop to the floor. Residue shall be removed from tank and boiler surfaces. A water stream shall be used to dislodge insulation in joints or irregular spaces that cannot be reached with tools. Lagging on piping and insulation on fittings shall be removed. A penetrating encapsulant shall be sprayed on all exposed tank, boiler and boiler breeching surfaces.]

3.9.4 Abatement of Asbestos Contaminated Soil (ACS)

[ACS shall be removed from areas to a minimum depth of [50] [_____] mm.[2] [_____] inches. Soil shall be thoroughly dampened with amended water and then removed by manual shoveling into labeled containers. The workers shall be closely monitored to protect from hazardous asbestos exposure and heat exhaustion. The minimum ventilation shall be increased to 8 air changes per hour from the usual 4 air changes per hour through a local exhaust HEPA system. See Sheet 73.] [The Contractor has the option to propose encapsulation of soil instead of removal. Since soil encapsulation is highly dependent on soil chemistry, available skills for application and proprietary products, the Contractor shall first test the proposed soil encapsulant on a minimum 9 square meters 100 square feet of soil area on site. The test shall be witnessed by the Contracting Officer's and the manufacturer's representative. A written application for encapsulation shall be submitted to the Contracting Officer with test results, encapsulants manufacturer positive recommendation for use, a guarantee for satisfactory performance for 10 years, and limitation of application. The Contracting Officer reserves the right to accept or reject the application with no effect to the contract. If the application is accepted the soil encapsulation shall proceed in compliance with all provisions and instructions of the encapsulant manufacturer and under the supervision of a person certified by the manufacturer that is trained and experienced in the proper application of the soil encapsulant. See Sheet 72.] [A concrete slab of minimum 50 mm 2 inch thickness shall be poured over the entire soil surface. Soil surface shall be thoroughly dampened before pouring concrete. Soil encapsulators and supervisors shall be primarily concrete workers trained to work in asbestos contaminated environments. See Sheet

71.]

3.9.5 Enclosure of Asbestos Containing Materials

Isolation of ACM by construction of a permanent enclosure shall be conducted as specified in Section [_____]. Enclosures shall be as follows: [enclosure of Acoustical Wall Plaster on Masonry Wall: See Sheet 37;]. [enclosure of Asbestos Contaminated Soil: See Sheet 71;] [enclosure of Acoustical Ceiling Plaster, Spray-on Fireproofing and Thermal Insulation Plaster: See Sheet 43].

3.9.6 Encapsulation of Asbestos Containing Materials

Prior to applying any encapsulant, the entire surface area shall be inspected for loose, or damaged asbestos material.

a. Penetrating Encapsulation: Before penetrating encapsulation is applied, asbestos removal work in the area shall be complete and the surfaces to be encapsulated shall be free of loose or damaged material. Substrate must be evaluated before application to ensure that the encapsulant will not cause the substrate to fail in any way. Acoustical wall and ceiling plaster surfaces shall be encapsulated in accordance with manufacturer's recommendations. Plug samples shall be taken to determine if full penetration has been achieved. If full penetration has not been achieved, surfaces shall be recoated while the matrix is still wet until full penetration has been achieved: See Sheet 39.

b. Bridging Encapsulation: Prior to applying the bridging encapsulant the pre-encapsulation inspection shall be performed. The surface shall be encapsulated in sections of 90 square meters 1000 square feet or less as recommended by the encapsulant manufacturer. Upon completion of each section, the dry thickness of the bridging encapsulation shall be measured. Additional bridging encapsulant shall be applied to obtain the desired encapsulant thickness. Additional coats must blend with the original bridging encapsulant. Bridging encapsulation shall include:

[Troweled Wall Plaster: See Sheet 29;]
[Troweled Ceiling Plaster: See Sheet 34;]
[Acoustical Wall Plaster: See Sheet 38;]
[Acoustical Ceiling Plaster: See Sheet 34;]
[Asbestos Cement Wall, Fiberboard and Drywall Panels: See Sheet 49;]
[Exterior Asbestos Stucco: See Sheet 76;]
[Interior Asbestos Stucco: See Sheet 77;]
[Storage Tank and Boiler Breeching: See Sheet 91;]
[Boiler and Piping Gasket: See Sheet 98].

3.9.7 Combination Encapsulation of Acoustical Wall and Ceiling Plaster

The combination penetrating/bridging encapsulation system shall be installed by first applying the penetrating encapsulant and then the bridging encapsulant: See Sheet 40.

3.9.8 Repair of Asbestos Containing Architectural Surfaces

Following materials shall be repaired:

[Troweled Wall Plaster on Studs: See Sheet 30]
[Troweled Ceiling or Wall Plaster on Masonry: See Sheet 31]
[Acoustical Ceiling on Wall Plaster: See Sheet 41]
[Vinyl or Vinyl Asbestos Tile Adhered to Concrete Floor System by Asbestos Containing Adhesive: See Sheet 56]
[Vinyl or Vinyl Asbestos Tile Adhered to Wood Floor System by Asbestos Containing Adhesive: See Sheet 60]
[Interior Stucco: See Sheet 78]
[Exterior Stucco: See Sheet 80]
[Pipe and Fitting Insulation (using Glove bag): See Sheet 86]
[Storage Tank and Boiler Breeching: See Sheet 92]
[Duct Insulation: See Sheet 100]

3.9.9 Encasement of Asbestos Containing Materials

Prior to applying the first layer of the polymer system, the structural stability of the ACM shall be verified. Encasement materials shall not be applied until all removal work within the work area has been completed. Mechanical fasteners shall be installed to wall, mesh or deck as needed. A low density cellular or polymer shall be applied to a depth of approximately 25 mm. 1-inch. The asbestos substrate shall be completely encased. A polymer finish containing fiberglass shall be applied over the low density cellular foam to a thickness of 25 mm. 1-inch.All system components shall be applied according to the system manufacturer's instructions and data. Encased material shall be decontaminated. Encasement shall be applied to:

[Beams and Decking: See Sheet 66]
[Columns: See Sheet 67]
[Acoustical Ceiling Insulation: See Sheet 69]
[Storage Tank and Boiler Breeching: See Sheet 90]

3.9.10 Sealing Contaminated Items Designated for Disposal

Contaminated architectural, mechanical, and electrical appurtenances such as venetian blinds, full height partitions, carpeting, duct work, pipes and fittings, radiators, light fixtures, conduit panels, and other contaminated items designated for removal shall be coated with an asbestos lockdown encapsulant at the demolition site before being removed from the asbestos control area. These items need [to] [not] be vacuumed prior to application of the lock-down encapsulant. The asbestos lockdown encapsulant shall be tinted a contrasting color. It shall be spray applied by airless method. Thoroughness of sealing operation shall be visually gauged by the extent of colored coating on exposed surfaces.

3.9.11 Exposed Pipe Insulation Edges

Asbestos insulation to remain shall have exposed edges contained. Wet and cut the rough ends true and square with sharp tools and then encapsulate the edges with a 6.4 mm (1/4-inch) 1/4-inch thick layer of non-asbestos containing insulating cement troweled to a smooth hard finish. When cement is dry, lag the end with a layer of non-asbestos lagging cloth, overlapping the existing ends by 100 mm. 4 inches.

3.10 FINAL CLEANING AND VISUAL INSPECTION

The abated asbestos regulated work area shall be cleaned by collecting, packing, and storing all gross contamination; see SET-UP DETAIL SHEETS 9, 14 and 20. A final cleaning shall use HEPA vacuum and wet cleaning of all

exposed surfaces and equipment in the asbestos regulated work area. Upon completion of the cleaning, the Contractor shall conduct a visual pre-inspection of the cleaned area in preparation for a final inspection before final air clearance monitoring and reclean, as necessary. Upon completion of the final cleaning, the Contractor and the Contracting Officer shall conduct a final visual inspection of the cleaned work area in accordance with ASTM E 1368 and document the results on the Final Cleaning and Visual Inspection as specified on the SET-UP DETAIL SHEET 19. If the Contracting Officer rejects the abatement area as not meeting final cleaning requirements, the Contractor shall reclean as necessary and have a follow-on inspection conducted with the Contracting Officer. Recleaning and follow-up reinspections shall be at the Contractor's expense.

3.11 LOCK DOWN

Prior to removal of plastic barriers and after clean-up of gross contamination and final visual inspection, a post removal (lockdown) encapsulant shall then be spray applied to ceiling, walls, floors, and other surfaces in the removal area. The abatement area shall include but not to be limited to constructed enclosures, barriers, polyethylene sheeting that covers any furnishings, and equipment articles to be discarded, critical barriers, air locks, load out units for bag removal, and onsite constructed decontamination unit.

3.12 AIR SAMPLING

Sampling and analysis of airborne concentration of asbestos fibers shall be performed in accordance with CFR 29 Part 1926 Section 1926.58, the Contractor's air monitoring plan, and as specified herein. Personal air monitoring samples shall be taken for at least 25 percent of the workers in each shift, or a minimum of two, whichever is greater. Results of the personal samples shall be posted at the job site and made available to the Contracting Officer as specified herein. The Contractor shall maintain a fiber concentration inside enclosed containment regulated work area equal to or less than 0.1 f/cc expressed as an 8 hour, time-weighted average (TWA) during the conduct of the asbestos abatement. If fiber concentration rises above 0.1 f/cc, work procedures shall be investigated with the Contracting Officer to determine the cause. At the discretion of the Contracting Officer, fiber concentration may exceed 0.1 f/cc but shall not exceed 1.0 f/cc expressed as an 8-hour TWA. The Contractor's workers shall not be exposed to an airborne fiber concentration in excess of 1.0 f/cc, as average over a sampling period of 30 minutes. Should either an environmental concentration of 1.0 f/cc expressed as an 8-hour TWA or a personal excursion concentration of 1.0 f/cc expressed as a 30-minute sample occur inside the contained (enclosure) regulated work area, the Contractor shall stop work immediately, notify the Contracting Officer, and implement additional engineering controls and work practice controls to reduce airborne fiber levels below prescribed limits in the work area. Work shall not restart until authorized by the Contracting Officer. Air monitoring results at the 95 percent confidence level shall be calculated as shown in Table 2 at the end of this section. [The Contractor] [The Contracting Officer] shall provide an onsite independent testing laboratory with qualified analysts and appropriate equipment to conduct sample analyses of air samples using the methods prescribed in CFR 29 Part 1926 Section 1926.58 to include NIOSH Pub No. 84-100 Method 7400. Sampling performed in accordance with CFR 29 Part 1926 Section 1926.58 shall be performed by the Contractor's IH. [Sampling performed for environmental and quality control reasons shall be performed by the [Contractor's IH] [and] [the Contracting Officer's IH].] [Sampling performed after final

clean-up, i.e. final clearance air sampling, shall be performed by the [Contractor's IH] [Contracting Officer's IH]. Personal sampling required by CFR 29 Part 1926 Section 1926.58, the NIOSH Pub No. 84-100 Method 7400 shall be used for sampling and Phase Contract Microscopy (PCM) analysis. For environmental quality control and final air clearance [NIOSH Pub No. 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH Pub No. 84-100 Method 7402 Transmission Electron Microscopy (TEM)] [the mandatory EPA TEM Method specified at CFR 40 Part 763] shall be used. For environmental and final clearance samples, sampling will be conducted at a sufficient velocity and time to collect a sample volume necessary to establish the limit of detection of the method used at 0.005 f/cc. Asbestos fiber concentration confirmation of the total fiber concentration results of environmental, quality assurance and final air clearance samples, collected and analyzed by NIOSH Pub No. 84-100 Method 7400, may be conducted. Confirmation analysis shall be carried out using transmission electron microscopy in accordance with NIOSH Pub No. 84-100 Method 7402. When such confirmation is conducted, it shall be from the same sample filter used for the NIOSH Pub No. 84-100 Method 7400 PCM analysis. For all Contractor required environmental, quality control or final air clearance monitoring, confirmation of asbestos fiber concentrations, using NIOSH Pub No. 84-100 Method 7402, shall be at the Contractor's expense. Monitoring may be duplicated by the Government at the discretion of the Contracting Officer. If the air sampling results obtained by the Government are lower than those results obtained by the Contractor, the Government results shall prevail.

3.12.1 Sampling Prior to Asbestos Work

The baseline air sampling shall be established one day prior to the masking and sealing operations for each abatement area site. The background shall be established by performing area sampling in similar but uncontaminated sites in the building. Preabatement [NIOSH Pub No. 84-100 Method 7400, PCM] [EPA TEM Method specified at CFR 40 Part 763] air samples shall be collected at a minimum of three locations. These locations are: outside the building, inside the building, but outside the abatement area perimeter and inside each abatement area. One sample shall be collected for every 185 square meters 2000 square feet of floor space. At least two sample locations shall be collected outside the building. The PCM samples shall be analyzed immediately; and if any result in fiber concentration greater than 0.01 f/cc, asbestos fiber concentration shall be confirmed using NIOSH Pub No. 84-100 Method 7402 (TEM) at Government expense.

3.12.2 Sampling During Asbestos Abatement Work

The Contractor's IH shall provide personal and area sampling as indicated in CFR 29 Part 1926 Section 1926.58, state and local requirements, and in accordance with the Contractor's air monitoring plan. Area sampling shall be conducted at least once every shift, close to the work in the containment area, outside the clean room entrance to the containment area, (outside air lock for mini and modified containment areas), inside the clean room (inside the air lock for mini and modified containment areas), outside the load-out unit exit, if used, and at the exhaust discharge point of the local exhaust system. If the sampling outside the containment area shows airborne fiber levels have exceeded background or 0.01 f/cc, whichever is greater, all work shall be stopped immediately, and the Contracting Officer notified. The condition causing the increase shall be corrected. Work shall not restart until authorized by the Contracting Officer. [In areas where the construction of a containment area is not required, after initial time weighted average (TWA) airborne fiber

concentrations are established, and provided the same type of work is being performed, the [PCM], [TEM] sampling shall be conducted at the boundary of the asbestos regulated work area in such locations and at such frequency as recommended by the Contractor's IH.] [Where glove bag methods are used, personal and area air sampling shall be performed at locations and frequencies that will accurately characterize any evolving airborne fiber levels.]

3.12.3 Sampling After Final Clean-Up (Clearance Sampling)

Prior to conducting final air clearance monitoring, the Contractor and the Contracting Officer shall conduct a final visual inspection of the Contractor's final cleanup of the abated asbestos regulated work area as specified on SET-UP DETAIL SHEET 19. Final clearance air monitoring shall not begin until acceptance of this final cleaning by the Contracting Officer. [The Contractor's IH] [The Contracting Officer's IH] will provide area sampling of airborne fibers using aggressive air sampling techniques as defined in the EPA 560/5-85-024 or as otherwise required by Federal or state requirements. The sampling and analytical method used will be [NIOSH Pub No. 84-100 Method 7400 (PCM) with optional confirmation of results by NIOSH Pub No. 84-100 Method 7402 (TEM).] [the mandatory EPA TEM Method specified at CFR 40 Part 763.] The final clearance air samples shall be collected and analyzed as indicated in [Table 3 at the end of this section and NIOSH Pub No. 84-100 Method 7400 (PCM)] [or] [the EPA Mandatory Method as specified in Table 4 at the end of this section and, CFR 40 Part 763 (TEM)].

3.12.3.1 NIOSH Method

For PCM sampling and analysis using NIOSH Pub No. 84-100 Method 7400, the fiber concentration inside the abated asbestos regulated work area, for each airborne sample shall be less than 0.01 f/cc. Decontamination of the abated asbestos regulated work area is considered complete when every PCM final clearance sample is below the clearance limit. If any sample result is greater than 0.01 f/cc, the asbestos fiber concentration from that same filter shall be confirmed using NIOSH Pub No. 84-100 Method 7402 (TEM) at Contractor's expense. If any confirmation sample result is greater than 0.01 f/cc then abatement is incomplete and recleaning is required. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria is required.

3.12.3.2 EPA Method

For TEM sampling and analysis using the EPA Mandatory Method specified in CFR 40 Part 763, decontamination of the abated asbestos regulated work area is considered complete when the arithmetic mean concentration of the 5 inside samples is less than or equal to 70 structures per square millimeter (70 S/mm). When the arithmetic mean is greater than 70 S/mm, the 3 blank samples shall be analyzed. If the three blank samples are greater than 70 S/mm, resampling is required. If less than 70 S/mm, the five outside samples shall be analyzed and a Z-test analysis performed. When the Z-test results are less than 1.65, the decontamination can be considered complete. If the Z-test results are more than 1.65, the abatement is incomplete and recleaning is required. Upon completion of any required recleaning, resampling with results to meet the above clearance criteria is required.

3.12.4 Air Clearance Failure

Should clearance sampling results fail to meet the final clean-up

requirements, the Contractor shall pay all costs associated with all required recleaning, resampling and analysis until final clean-up requirements are met.

3.13 SITE INSPECTION

While performing asbestos removal work, the Contractor shall be subject to onsite inspection by the Contracting Officer who may be assisted by or represented by quality assurance, safety and industrial hygiene personnel. If the work is found to be in violation of this specification, the Contracting Officer or his representative will issue a stop work order to be in effect immediately and until the violation is resolved. Standby time required to resolve the violation shall be at the Contractor's expense.

3.14 CLEAN-UP AND DISPOSAL

3.14.1 Housekeeping

Surfaces of the regulated work area shall be kept free of accumulation of asbestos-containing debris. Meticulous attention shall be given to restricting the spread of dust and debris. HEPA filtered vacuum cleaners shall be used. The space shall not be blown down with compressed air. When asbestos removal is complete, all asbestos waste is removed from the work site, and final clean-up is completed, the Contracting Officer will certify the areas as safe before the warning signs and boundary warning tape can be removed. After final clean-up and acceptable airborne concentrations are attained, but before the HEPA unit is turned off and the containment removed, the [Contractor shall] [Government will] remove all pre-filters on the building HVAC system and provide new pre-filters. The Contractor shall dispose of such filters as asbestos contaminated materials. HVAC mechanical, and electrical systems shall be re-established in proper working order. The Contracting Officer will visually inspect all surfaces within the containment for residual material or accumulated debris. The Contractor shall reclean all areas showing dust or residual materials. The Contracting Officer shall certify in writing that the area is safe before unrestricted entry is permitted. The Government shall have the option to perform monitoring to certify the areas are safe before entry is permitted.

3.14.2 Title to Materials

Material resulting from abatement work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of as specified in applicable local, state, and Federal regulations and herein.

3.14.3 Collection and Disposal of Asbestos

Asbestos waste, asbestos contaminated water, scrap, debris, bags, containers, equipment, and asbestos contaminated clothing, shall be collected and placed in sealed leak-tight, containers (e.g. double 0.152 mm (6-mil) 6-mil plastic bags) (see Detail Sheet 9A), sealed 0.152 mm (6-mil) 6-mil double wrapped polyethylene sheet (see Detail Sheet 9.B), sealed fiberboard boxes (see sheet 9.C) or other approved containers. Waste within the containers must be wetted in case the container is breeched. A warning and Department of Transportation (DOT) label shall be affixed or preprinted on each bag; see DETAIL SHEET 14. Waste asbestos material shall be disposed of [at an EPA, state and local approved asbestos landfill] [off Government property.] For temporary storage, sealed impermeable containers shall be stored in asbestos waste load-out unit or in a

storage/transportation conveyance (i.e.; dumpster, roll-off waste boxes, etc.) in a manner as accepted by and in an area as assigned by the Contracting Officer. Procedure for hauling and disposal shall comply with CFR 40 Part 61, Subpart M, state, regional, and local standards.

3.14.4 Asbestos Waste Shipment Record

The Contractor shall complete and provide final completed copies of the Waste Shipment Record for all shipments of waste material as specified in CFR 40 Part 61, Subpart M and other required state waste manifest shipment records within 3 days of delivery to the landfill.

TABLE 1

SUMMARY OF WORK TASKS

TASK (1)	__	__	__
LOCATION (2)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
DESCRIPTION (3)	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
TECHNIQUE (4)	_____	_____	_____
FRIABLE (5)	___	___	___
NF-1	___	___	___
NF-2	___	___	___
FORM (6)	_____	_____	_____
CONDITION	_____	_____	_____
QUANTITY (7)			
LINEAR FT.	_____	_____	_____
SQUARE FT.	_____	_____	_____
RESP. SHEET (8)	_____	_____	_____
SET-UP SHEET (9)	__, __, __, __,	__, __, __, __,	__, __, __, __,
	__, __, __, __,	__, __, __, __,	__, __, __, __,
	__, __, __, __,	__, __, __, __,	__, __, __, __,
	__, __, __, __,	__, __, __, __,	__, __, __, __,

NOTES:
(1) Alpha sequence of work tasks (A, B, C, etc.) for each asbestos regulated work area. Each category of friability has a separate task.
(2) Specific location of the work (building, floor, area, etc.)
(3) Description of material.
(4) Technique to be used: Removal = REM; Encapsulation = ENCAP; Encasement = ENCAS; Enclosure = ENCL; Repair = REP.
(5) Friability of materials: Friable = FR; Non-friable = NF-1 or NF-2; (number indicates friable category).
(6) Form: Interior or Exterior Architectural = IA or EA; Mechanical/Electrical = ME. Condition: Good = G; Fair = F; Poor = P.
(7) Quantity of ACM in Linear Meters (m); Linear Feet (ft);square meters square feet (sf)
(8) Response action sheet specifies the material to be abated and the method to be used.
(9) Set-up sheets indicate the containment and control methods to be used in support of the response action.

TABLE 2

FORMULA FOR CALCULATION OF THE 95 PERCENT CONFIDENCE LEVEL

(Reference: NIOSH 7400)

Fibers/cc (01.95 percent CL) = X + [(X) * (1.645) * (CV)]

Where: X = ((E) (AC)) / ((V) (1000))

E = ((F/Nf) - (B/Nb)) / Af

CV = The precision value; 0.45 shall be used unless the analytical laboratory provides the Contracting Officer with documentation (Round Robin Program participation and results) that the laboratory's precision is better.

AC = Effective collection area of the filter in square millimeters

V = Air volume sampled in liters

E = Fiber density on the filter in fibers per square millimeter

F/Nf = Total fiber count per graticule field

B/Nb = Mean field blank count per graticule field

Af = Graticule field area in square millimeters

TABLE 3

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol.(Note 2) (Liters)	Sampling Rate (liters/min)
Inside Abatement Area	5/140 Square Meters (Notes 3 & 4)	0.45 micrometers	1500	2-10
Each Room in Abatement Area Less than 140 Square Meters	1	0.45 micrometers	1500	2-10
Field Blank	2	0.45 micrometers	0	0
Laboratory Blank	1	0.45 micrometers	0	0

TABLE 3

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Sample Location	Minimum No. of Samples	Filter Pore Size (Note 1)	Min. Vol.(Note 2) (Liters)	Sampling Rate (liters/min)
Inside Abatement Area	5/1500 Square Feet (Notes 3 & 4)	0.45 microns	1500	2-10
Each Room in Abatement Area Less than 1500 Square Feet	1	0.45 microns	1500	2-10

TABLE 3

NI0SH METHOD 7400

PCM ENVIRONMENTAL AIR SAMPLING PROTOCOL (NON-PERSONAL)

Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:
1. Type of filter is Mixed Cellulose Ester.

2. Ensure detection limit for PCM analysis is established at 0.005 fibers/cc.

3. One sample should be added for each additional 140 square meters.1500 square feet.

4. No less than 5 samples are to be taken per abatement area, plus two field blanks.

TABLE 4

EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sampled	Minimum No. of Samples	Filter Pore Size	Min. Vol. (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	5	0.45 micrometers	1199	2-10
Outside Abatement Area	5	0.45 micrometers	1199	2-10
Field Blank	2	0.45 micrometers	0	0
Laboratory Blank	1	0.45 micrometers	0	0

TABLE 4

EPA AHERA METHOD: TEM AIR SAMPLING PROTOCOL

Location Sampled	Minimum No. of Samples	Filter Pore Size	Min. Vol. (Liters)	Sampling Rate (liters/min.)
Inside Abatement Area	5	0.45 microns	1199	2-10
Outside Abatement Area	5	0.45 microns	1199	2-10
Field Blank	2	0.45 microns	0	0
Laboratory Blank	1	0.45 microns	0	0

Notes:
1. Type of filter is Mixed Cellulose Ester.

2. The detection limit for TEM analysis is 70 structures/square mm.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME _____ CONTRACT NO. _____
PROJECT ADDRESS _____ _____
CONTRACTOR'S NAME _____
EMPLOYEE'S NAME _____
WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAVE BEEN LINKED WITH TYPES OF LUNG DISEASE AND CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS, THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NONSMOKING PUBLIC.

Your employer's contract for the above project requires that: you be provided with and complete formal and project specific training, you be supplied with proper personal protective equipment including respirators, that you be trained in its use and that you receive a medical examination to evaluate your physical capacity to perform your assigned work tasks, under the environmental conditions expected, while wearing the required personal protective equipment. These things are to be done at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

Date Completed

FORMAL TRAINING: I have completed a formal training course for: asbestos abatement workers (for workers) (Contractor/ Supervisor) that meets EPA's and this state's requirements. . . . . _____

In addition, I have completed annual refresher as required by EPA and this state's requirements. . . . . _____

PROJECT SPECIFIC TRAINING: I have been provided and have completed the project specific training required by this Contract. My employer's industrial hygienist and competent person supervisor conducted the training. . . . . _____

RESPIRATORY PROTECTION: I have been trained in accordance with the criteria in the Contractor's Respiratory Protection program. I have been trained in the dangers of handling and breathing asbestos dust and in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy of my employer. . . . . _____

RESPIRATOR FIT-TEST TRAINING: I have been trained in the proper selection, fit, use, care, cleaning, and maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in the Contractor's Respiratory Program and have received a satisfactory fit. I have been assigned my individual respirator. I have been taught how to properly perform positive and negative pressure fit-check upon donning negative pressure respirators each time. . . . . _____

CERTIFICATE (Continued)

MEDICAL EXAMINATION: I have had a medical examination within the last twelve months which was paid for by my employer. The examination included: health history, pulmonary function tests, and may have included an evaluation of a chest x-ray. A physician made determination regarding my physical capacity to perform work tasks on the project while wearing personal protective equipment including a respirator. I was personally provided a copy and informed of the results of that examination. My employer's industrial hygienist evaluated the medical certification provided by the physician and checked the appropriate blank below.
The physician determined that there:

_____ were no limitations to performing the required work tasks;

_____ were identified physical limitations to performing the required work tasks.

Employees Signature _____ date _____

Printed Name _____

Social Security Number _____

Contractor's Industrial Hygienist Signature _____
date _____

Printed Name _____

Social Security Number _____

Date medical exam completed _____

-- End of Section --