EXHIBIT 11

CLEVELAND PUBLIC LIBRARY

Finance Committee Meeting
September 19, 2017

RESOLUTION AUTHORIZING AMENDMENT TO AGREEMENT WITH ALBERT M. HIGLEY CO., LLC FOR THE SOUTH BRANCH RENOVATION PROJECT

WHEREAS, On October 20, 2016, the Board of Trustees of the Cleveland Public Library authorized the Library to enter into an agreement with the Albert M. Higley Co., LLC ("Higley") to perform construction management services for the South Branch Renovation Project for a total contract price not-to-exceed $368,353.75, and the Library executed the agreement on November 9, 2016; and

WHEREAS, On December 15, 2016, this Board authorized the Library to enter into an amendment to the agreement with Higley to expand the scope of Higley's services to include performing work necessary to assess the main skylight at the South branch for an additional cost of $3,700, increasing the total contract price to $372,053.75; and

WHEREAS, Prior to the commencement of construction at the South branch, asbestos abatement must be performed, and a utility pole must be moved and AT&T wires relocated to make room for handicap parking; and

WHEREAS, Higley has proposed to perform construction management services for the asbestos abatement and utility pole and AT&T wire relocation at the South branch for a cost not-to-exceed $79,066.54 as set forth in its Guaranteed Maximum Price proposal dated September 14, 2017; and

WHEREAS, The Library hereby requests that this Board authorize an amendment to the Agreement with Higley to provide construction management services for the asbestos abatement and utility pole and AT&T wire relocation in the amount of $79,066.54; now therefore be it

RESOLVED, That this Board approves the Guaranteed Maximum Price amendment to the agreement with the Albert M. Higley Co., LLC in the amount of $79,066.54 to be paid from the Building and Repair Fund Account 40178305-55300-10783, and further authorizes the Executive Director, CEO or his designee, to execute said amendment, subject to the review and approval of the Chief Legal Officer.

a|m|HIGLEY
Beyond Bricks and Mortar

THE ALBERT M. HIGLEY CO.
2926 CHESTER AVENUE
CLEVELAND, OHIO 44114-4414
OFFICE: 216.861.2050
WWW.AMHIGLEY.COM

September 14, 2017

Mrs. Joyce Dodrill
Mr. Eric Herman
Cleveland Public Library
325 Superior Ave.
Cleveland, OH 44114

Dear Eric and Joyce,

The Albert M. Higley Co. is pleased to provide a Guaranteed Maximum Price (GMP) Proposal for the Cleveland Public Library South Renovation Abatement Scope of work and the AT&T Payment

The GMP Proposal is in the current amount of $79,066.54

We organize our GMP Proposal as follows:

1. Form of GMP Amendment
2. Exhibit 1- GMP Schedule of Values
3. Exhibit 2- GMP Allowance Items
4. Exhibit 3- Abatement Report
5. Exhibit 4- (Not Applicable)
6. Exhibit 5- (Not Applicable)
7. Exhibit 6- GMP Assumptions and Clarifications
8. Exhibit 7- (Not Applicable)
9. Exhibit 8- (Not Applicable)

Sincerely,

The Albert M. Higley Co.

David Meehan
Project Executive

Form of GMP Amendment

AMENDMENT NO. 1 TO CONSTRUCTION MANAGEMENT AGREEMENT

Pursuant to the terms of the AIA A133-2009 Construction Management Agreement (the "Agreement") dated as of November 9, 2016, by and between **BOARD OF TRUSTEES OF THE CLEVELAND PUBLIC LIBRARY** ("Owner") and **THE ALBERT M. HIGLEY CO.** ("Construction Manager"), the Owner and the Construction Manager desire to enter into this Amendment to Construction Management Agreement (this "Amendment") to establish a GMP for the Work described in the Agreement. Therefore, the Owner and the Construction Manager agree as follows:

1. Construction Manager's guaranteed maximum price for the Work described in the Agreement (the "GMP"), including the Cost of the Work, Construction Manager's Fee, the General Conditions Costs Compensation, and the Construction Contingency is Seventy-Nine Thousand sixty-Six Dollars and Fifty- Four Cents ($79,066.54).

2. Construction Manager's Fee shall be Two Thousand Three Hundred Two Dollars and Ninety-One Cents ($2,302.91).

3. The Construction Manager as Adviser Fee (if applicable) shall be __NA_____ Dollars ($_____).

4. The Construction Contingency shall be Two Thousand One Hundred Fifty-Nine Dollars and Forty-Five Cents ($2,159.45).

5. The attached Exhibits are a part of the Agreement as if each were physically incorporated therein.

   EXHIBIT 1 Schedule of Values, dated ___9/14/17_____, _____1____ pages.

   EXHIBIT 2 Allowance items, dated ____9/14/17_____, ____1____ pages.

   EXHIBIT 3 Drawings and Specifications upon which the GMP is based, dated __9/14/17_____, _____51____ pages.

   EXHIBIT 4 Construction Schedule, dated ___NA_____, ____0_____ pages.

   EXHIBIT 5 Unit Prices, dated _____NA_____, ___0_____ pages.

   EXHIBIT 6 Assumptions and Clarifications, dated __9/14/17_____, _____1_____ pages.

   EXHIBIT 7 Identified Claims, dated ___NA___, _____0_____ pages.

   EXHIBIT 8 Add Alternates Schedule, dated ____NA_____, ____0_____ pages.

6. Capitalized words and phrases herein shall have the same meanings as are ascribed to such words in the Agreement.

7. This Amendment may be executed by the parties in separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts shall together constitute but one and the same instrument.

8. Except as specifically amended herein, all of the provisions of the Agreement remain in full force and effect and all terms and conditions of the Agreement shall apply. In the event of an irreconcilable conflict between the terms of the Agreement and those of this Amendment, the terms of this Amendment shall control.

9. By execution of this Amendment, the Construction Manager acknowledges that, as of the date of this Amendment, the Construction Manager is not aware of, and has not reserved, any claim against the Owner except as otherwise identified on **EXHIBIT 7** (if any).

This Amendment is entered as of ___September 14th___, 2017.

CLEVELAND PUBLIC LIBRARY	**THE ALBERT M. HIGLEY CO.**
By: _____	By: _____
Name:_____	Name: _____
Its: _____	Its: _____

The Albert M. Higley Co. **9/14/2017**

Exhibit 1

Cleveland Public Library South Renovation- Abatement and AT+T Payment
Guaranteed Maximum Price Schedule of Values

Description	Base Bid	Subcontractor
Abatement	$44,680.00	AAA American Abatement
AT+T	$23,448.10	AT+T
Allowances	$3,000.00	
Subcontractor Default Insurance	$853.54	
Subtotal	$71,981.64	
Construction Contingency	$2,159.45	3%
General Conditions	$50.00	Mileage Reimbursement
PreConstruction Services	$0.00	
Staff & Staff Reimbursables	$975.00	15 hours of PM time @ $65
Insurance and Applicable Tax	$885.55	1.12%
Builders Risk Insurance	NA	Not Included, By Owner
AMH CM Bond	$712.00	
Building Permit/Plan Review	NA	Not Included, By Owner
Owner Contingency	NA	Not Included, By Owner
CM Fee	$2,302.91	3%
Total Construction GMP	$79,066.54	

Exhibit 2

9/14/17

GMP Allowances Items

General Construction Allowances:

1. Electrical work required by Abatement Contractor- $1,500
2. Plumbing work required by Abatement Contractor - $1,500

SECTION 02 82 13 ASBESTOS ABATEMENT

The project consists of asbestos abatement at the South Branch of the Cleveland Public Library, 2704 Clark Avenue, Cleveland, Ohio. The Project Manager for the project is Mr. Eric Herman, Capital Projects, 216-706-2025.

Abatement Project Design was prepared by MCM Services. MCM Services is responsible for this asbestos abatement design, on-site monitoring and project oversight during asbestos abatement activities, and preparation of closeout documents. Ms. Amy Cseh is the project manager for the project at can be contacted at (440) 796-1126 or email at amc@mcmservicesohio.com.

The Asbestos Survey report for the affected areas and materials for the South Branch Building is provided for reference purposes in Appendix A. Contractor shall rely on this information for an inventory of asbestos containing materials. Total quantities of ACM for removal are detailed in this specification. Contractor is responsible for exploratory demolition to locate concealed materials.

The Work shall consist of a project where the Contractor shall provide all the materials, labor and equipment necessary to remove and dispose of designated asbestos containing materials (ACM), as asbestos containing and contaminated waste, for Cleveland Public Library, in all designated locations identified at the pre-bid meeting and as set forth herein. Contractor may utilize Table 1 in this section for total quantities of ACM to be removed. Contractor shall also reference Asbestos Survey Reports in Appendix A. Contractor is responsible for the abatement of all designated asbestos containing materials. The Contractor shall coordinate his work with Owner's Representative and the Owner. The buildings included in this bid package will be vacant at the time of the Contractor's work.

This project specifies a minimum of $1,000,000 of acceptable asbestos abatement liability insurance. The policy shall be an occurrence type with no sunset clause. The Contractor shall not commence work under this contract until he has obtained all the insurance required hereunder and as required by the Owner, and until such insurance has been approved by Owner. Nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required of this subcontractor has been so obtained and approved. The Contractor shall name as additionally insured Cleveland Public Library for purposes of General Liability. Approval of the insurance by the Owner shall not relieve or decrease the liability of the Contractor hereunder.

Asbestos abatement work will be performed in preparation for building demolition. **Work is scheduled to be completed in a single mobilization.** Any non-asbestos demolition waste debris generated during the project shall be properly disposed of by the Contractor. Contractor shall remove all perishable debris. The Contractor shall protect anything designated by the Owner to be saved in the work areas.

Contractor shall also remove all encapsulated/contaminated barriers at the completion of the project. Dumpsters may be spotted adjacent to the building. Hours of work are flexible and must be scheduled to ensure timely completion of work.

Owner shall maintain water and electrical service to the buildings for the duration of Contractor's work. Contractor shall be responsible for the security of his equipment, supplies, and dumpsters. Contractor shall provide a key to the Owner for any door locks installed for emergency access. Owner shall assist with electrical access, and Electrical Contractor shall connect / disconnect Contractor's temporary power panels. Contractor shall still be responsible for ("make safe") for all work areas. Contractor shall be required to provide any temporary power and lighting to the work areas. Contractor shall be responsible for all supplies/materials needed for temporary power panel installations.

Contractor shall provide generators if specific electrical requirements are not met by the building.

The following Table 1 provides general locations and estimated quantities.

ACM	HG	Units		Removal Method
Wall/Ceiling Plaster-abatement/demo (includes door and shelf removal) – refer to drawings issued by HBM Architects for damaged plaster locations and door and shelf removal locations	B	1,220	SF	OSHA Class I Removal
Ceiling Plaster-spot abatement for lighting (12”x12” square) – Refer to drawings issued by HBM Architects for specific lighting penetration locations	A	86	Locations	OSHA Class I Removal
9"x9" Floor Tile and Mastic; White, Grey	C	7103	SF	OSHA Class II Intact Removal

OSHA = Occupational Safety and Health Administration

Base Bid Abatement Work

The abatement work will be bid in the following manner

Base Bid: Bidders are to include in their price all work required to abate the materials identified on Table 1.

The Work of the project encompasses removal of the aforementioned asbestos containing materials on behalf of the Cleveland Public Library. Contractor is responsible for verifying the above stated quantities. Contractor will not be allowed to submit for any change orders that apply to designated Work, as identified in the specification, during the pre-bid walkthrough, or in bid documents.

During the bidding process, in the case of any discrepancy identified by bidding contractor, either in the quantity estimates, or in the specifications, the matter shall be promptly submitted to the Construction Manager who shall make necessary changes in a written addendum. Any adjustment by the Contractor without such notification shall be at Contractor’s own risk and expense. **Work which is not pre-approved in writing shall be the responsibility of the Contractor. Contractor shall submit lump sum bids to complete ALL work in the Work Areas as shown during the pre-bid walkthrough, as identified in the specifications, and as identified in bid documents.**

All work shall be pre-approved by Owner's Representative. Contractor shall submit a change order in writing to Owner's Representative for additional work during the course of the project.

MCM Services cannot guarantee that all asbestos containing material or other hazardous materials have been identified by the survey supporting this specification. Additional asbestos materials, not previously identified or quantified, are frequently encountered during renovation and demolition. Actual quantities of asbestos material may vary from the estimates provided in our report due to identification of additional materials and difficulties in measuring hidden materials. Prior to demolition of any structure or equipment, materials that were previously inaccessible or excluded from sampling should be sampled and analyzed for asbestos.

Section 02 82 13.1 Asbestos Abatement Work Procedures

If more than one work activity will be performed in a given area, the more stringent work area preparation methods shall be followed.

Class I Asbestos Abatement Work Procedures

All wall and ceiling plaster removal is classified as OSHA Class I work. Contractor may conduct gross removal. Carpet existing over asbestos containing floor tile shall be removed and disposed of as ACM waste.

Prepping requirements for gross removal in full negative pressure enclosures will consist of installing critical barriers, one layer of 4 - 6 mil polyethylene sheeting on all non-ACM walls, and a minimum of one layer on the floor. The Contractor shall seal HVAC system with two layers of 6 mil polyethylene sheeting as directed by the Owner and Owner's Representative. Contractor shall maintain a three-stage decontamination unit adjacent to the work areas. Final clearance sampling and analysis by PCM shall be performed after the Contractor has successfully passed a visual inspection by the Owner's on-site Representative, and the Work areas have obtained at least four air changes after encapsulation.

Class II Asbestos Abatement Work Procedures

The floor tile and mastic removal work has been classified as OSHA Class II work, and will either be completed within an existing full containment or conducted in such a manner so as the above-stated quantities of materials are removed as intact as possible using hand tools and wet removal techniques within containment.

All flooring and mastic shall be treated as asbestos-containing and/or contaminated waste. Contractor shall file regulatory notification for all flooring related work. Prepping for this Class II work shall include critical barriers. Contractor shall maintain a three-stage decontamination unit adjacent to the work areas. Waste shall be double wrapped in 6 mil polyethylene sheeting and disposed of as ACM. Final clearance sampling will be performed after the Contractor has successfully passed a visual inspection by the Owner's on-site Representative, and the Work area has obtained at least four air changes after encapsulation.

General work procedures

In general, the work procedures that will be enforced are as follows:

For all containment work, a manometer will be used to constantly monitor the pressure differential across the critical barrier. A minimum of -0.02 column inches of water pressure differential, relative to outside pressure, shall be established prior to the start of removal and maintained within the negative pressure enclosure as evidenced by manometric measurements. Contractor shall install and maintain a minimum number of air filtration devices in order to obtain at least four air changes in the work area per hour.

The term “containment” shall mean a work area where minimum prepping requirements prior to gross removal will consist of installing critical barriers and two layers of polyethylene on the floor, establishing negative pressure, and having a three-stage decontamination unit adjacent to the work area.

In all cases, the term "full containment" shall mean a work area where minimum prepping requirements prior to gross removal are equal to that for a "containment", except that all walls, ceilings and other items that are not to be removed shall be covered with at least one layer of polyethylene prior to gross removal. Contractor shall maintain a three-stage decontamination unit adjacent to the work areas; remote decontamination is not allowed. For full containment work, a manometer will be used to constantly monitor the pressure differential across the critical barrier. A minimum of –0.02 column inches of water pressure differential, relative to outside pressure, shall be established prior to the start of removal and maintained within the negative pressure enclosure as evidenced by manometric measurements. Contractor shall install and maintain a minimum number of air filtration devices in order to obtain at least four air changes in the work area per hour, and provide adequate circulation in the work area to prevent dead spots.

Further clarifications of work procedures can be found in Section 02 82 16. The Contractor is responsible for verifying all of the quantities of materials needed to complete the work, and any potential difficulty involved with establishing negative pressure or containments, or accessing designated materials. The information provided is not considered complete and accurate, and is only provided to assist the Contractor.

Contractor shall provide a copy of all project submittals and employee documentation to Owner's on-site representative prior to the start of the work. Submittals shall include but are not limited to the following: project agreement, governmental notifications, company abatement license, insurance certificate, workers certifications, and workers compensation certificate. Project submittals to be submitted during the course of the project shall include daily logs, personnel air monitoring data and waste manifests.

Work shall be performed in accordance with all local, state and federal regulations including those under OSHA, the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) and the Ohio Department of Health (ODH) as listed in Section 02 82 13.7 *Regulations*, and as described in Section 02 82 13.1 *Asbestos Abatement Work Procedures.* Any deviation from the Work Methodology must be submitted in writing and approved by EA Group's ODH licensed Project Designer prior to implementation.

MCM Services, acting on behalf of the Cleveland Public Library, will be monitoring the project so that the Contractor follows the established work methodology. Coordination of the project is as follows:

MCM Services
PO Box 696
Grand River, Ohio 44045
Ms. Amy Cseh
CAHES, CAHPD
V: 440-796-1126
E: amc@mcmservicesohio.com

OSHA Air Monitoring
The Contractor shall conduct all OSHA monitoring. The Contractor shall provide to the Owner's Representative written results within 96 hours of the sampling date. The Contractor shall monitor a minimum 25% of his personnel, focusing on those individuals who are likely to be exposed to the highest concentrations for each job function. Disputes on OSHA monitoring and late written results will be settled by requiring the Contractor to contract with a third party to do on site OSHA monitoring and

analysis at no cost to Owner.

Respiratory Protection
Respiratory protection will consist of, at a minimum, half face air purifying respirators during removal and cleaning work.

Section 02 82 13.2 Notifications and Permits

The following information is provided for use by the Contractor for governmental agency notifications purposes:

Cleveland Public Library
Building Number of Floors – 2
Building Age – >50 years
Present / Past use – public library

Asbestos removal notification will be submitted by the Contractor on behalf of Cleveland Public Library.

Section 02 82 13.3 Asbestos Hazard Abatement Project Agreement

No asbestos hazard abatement contractor shall enter into an agreement to perform any aspect of an asbestos hazard abatement project unless the agreement is in writing and contains all of the following provisions:

(1) All persons working on the project are licensed or certified by the Department of Health;

(2) Phase contrast microscopy (PCM) will be performed for clearance sampling. Therefore, all clearance monitoring shall be conducted in accordance with the National Institute of Occupational Safety and Health (NIOSH) method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, 3rd edition, Second Supplement, August 1987 (or most recent version). A minimum of three samples shall be taken and show that the concentration of fibers for each sample is less than or equal to a limit of quantitation for PCM of 0.01 fibers per cubic centimeter (f/cc) of air;

(3) All clearance air sampling will be conducted by an Asbestos Hazard Evaluation Specialist or Air Monitoring Technician certified by the Ohio Department of Health, or a Certified Industrial Hygienist (CIH) or Industrial Hygienist in Training (IHIT) as certified by the American Board of Industrial Hygiene;

(4) A detailed description of the project work scope, including the amount, indicated in linear or square feet, of asbestos-containing material to be abated, the exact location and type of that material, and whether or not a contained work site will be established as required by regulations of the United States Occupational Safety and Health Administration, 29 C.F.R. Part 1926.1101; and

(5) A requirement that all asbestos hazard abatement activities be done in accordance with all applicable federal, state, and local asbestos regulations.

Section 02 82 13.4 General Site and Project Requirements

Plan of Action

Submit a detailed plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location and layout of decontamination areas, the sequencing of asbestos work, the interface of trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, and a detailed description of the methods to be employed to control pollution. Expand upon the use of portable HEPA ventilation system, closing out of the building's HVAC system, method of removal to prohibit visible emissions in work area, and packaging of removed asbestos debris. The plan must be approved by the Owner's Representative prior to commencement of work.

Stop Work

If the Owner's Representative presents a written Stop Work order, immediately and automatically stop all work. Do not recommence work until authorized in writing by Owner's Representative. Stop Work conditions are explained in Section 02 82 13.8 Air Monitoring.

Section 02 82 13.5 Project Coordination

This Section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:

- Administrative and supervisory personnel.
- Pre-Construction Conference
- Attend weekly progress meetings
- Daily Log
- Special reports.
- Contingency Plans
- Notifications to other entities at job site.
- Employee documentation, including certifications, licenses, physicians written opinions, etc.

Administrative and Supervisory Personnel

General Superintendent: Provide a full-time General Superintendent who is experienced in administration and supervision of asbestos abatement projects including work practices (CAHAS), protective measures for building and personnel, disposal procedures, etc. This person is the Contractors' Representative responsible for compliance with all applicable federal, state and local regulations, particularly those relating to asbestos-containing materials.

Experience and Training: The General Superintendent must have completed a course at an EPA Training Center or equivalent certificate course in asbestos abatement procedures, and have had a minimum of two (2) years on-the-job training in asbestos abatement procedures.

Competent Person: The General Superintendent is to be a Competent Person as required by OSHA in 29 CFR 1926.

Accreditation: The General Superintendent is to be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C, and be licensed as a Certified Asbestos Hazard Abatement Specialist in accordance with ODH regulations.

Pre-Construction Conference

An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by the Building Owner/Building Owner's Representative prior to start of any work. Meet at project site, or as otherwise directed with Owner, Owner's Representative, Project Administrator, General Superintendent and other entities concerned with the asbestos abatement work.

This is an organizational meeting, to review responsibilities and personnel assignments, to locate the containment and decontamination areas and temporary facilities including power, light, water, etc.

Daily Log

Maintain at the work site a Daily Log documenting the dates and time of but not limited to, meetings, visitations, personnel entering and leaving the work area, special or unusual events, air monitoring test results, documentation of inspections, removal of waste materials from work area, and final inspection/final clearance testing. Provide one (1) copy of this log to Owner's Representative on a daily basis.

Contingency Plan

Prepare a contingency plan for emergencies including fire, accident, power failure, pressure differential system failure, supplied air system failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.

Post in clean room of Personnel Decontamination Unit telephone numbers and locations of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, and telephone company.

Notifications

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

Notify emergency service agencies including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations, modifications to fire notification or fire fighting equipment, and other information needed by agencies providing emergency services.

Notifications of Emergency: Any individual at the job site may notify emergency service agencies if necessary without effect on this Contract or the Contract Sum.

Submittals

Before the Start of Work: Submit the following to the Owner's Representative for review. No work shall begin until these submittals are returned with Owner's Representative's approval for unrestricted use or final-but-restricted use.

Notification to Government Agencies: for permits and authorization to begin abatement procedures.

Accreditation: Submit evidence in the form of a current Asbestos Abatement License for the Contractor, and a training course certificate of accreditation for the General Superintendent as an asbestos abatement supervisor.

Insurance: Submit evidence of acceptable Asbestos Abatement Insurance as required in contract documents.

Contingency Plans for emergency actions.

Telephone Numbers and location of emergency services.

Notifications sent to other entities at the work site.

Notifications sent to emergency service agencies.

Section 02 82 13.6 Definitions Relative to Hazardous Materials Abatement

Accredited or Accreditation (when referring to a person or laboratory): A person or laboratory accredited in accordance with section 206 of Title II of the Toxic Substances Control Act (TSCA).

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

Air Cell: Insulation normally used on pipes and duct work that is comprised of corrugated cardboard which is frequently comprised of asbestos combined with cellulose or refractory binders.

Air Monitoring: The process of measuring the fiber content of a specific volume of air.

Amended Water: Water to which a surfactant has been added to decrease the surface tension to 35 or less dynes.

Asbestos: The asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite. For purposes of determining respiratory and worker protection both the asbestiform and non-asbestiform varieties of the above minerals and any of these materials that have been chemically treated and/or altered shall be considered as asbestos.

Asbestos-Containing Material (ACM): Any material containing more than 1% by weight of asbestos of any type or mixture of types.

Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.

Asbestos-Containing Waste Material: Any material which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.
Asbestos debris: Pieces of ACBM that can be identified by color, texture, or composition, or means dust, if the dust is determined by an accredited inspector to be ACM.

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

Barrier: Any surface that seals off the work area to inhibit the movement of fibers.

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

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

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

Demolition: The wrecking or taking out of any building component, system, finish or assembly of a

facility together with any related handling operations.

Disposal Bag: A properly labeled clear (see through) 6 mil thick leak-tight plastic bags used for transporting asbestos waste from work and to disposal site.

Encapsulant: A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.

Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.

Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.

Removal encapsulant: a penetrating encapsulant specifically designed to minimize fiber release during removal of asbestos-containing materials rather that for in situ encapsulation.

Encapsulation: Treatment of asbestos-containing materials, with an encapsulant.

Enclosure: The construction of an air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.

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

Friable Asbestos Material: Material that contains more than 1.0% asbestos by weight and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

Glovebag: A sack (typically constructed of 6 mil transparent polyethylene or polyvinylchloride plastic) with inward projecting longsleeve gloves, which are designed to enclose an object from which an asbestos-containing material is to be removed.

HEPA Filter Vacuum Collection Equipment (or vacuum cleaner): High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

High-efficiency particulate air filter (HEPA): refers to a filtering system capable of trapping and retaining 99.97 percent of all monodispersed particles 0.3 um in diameter or larger.

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

Negative Pressure Ventilation System: A pressure differential and ventilation system.

Personal Monitoring: Sampling of the asbestos fiber concentrations within the breathing zone of an employee.

Pressure Differential and Ventilation System: A local exhaust system, utilizing HEPA filtration

capable of maintaining a pressure differential with the inside of the Work Area at a lower pressure than any adjacent area, and which cleans recirculated air or generates a constant air flow from adjacent areas into the Work Area.

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

Repair: Returning damaged ACBM to an undamaged condition or to an intact state so as to prevent fiber release.

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

Surfactant: A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

Testing Laboratories: A "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the project site or elsewhere, and to report on, and, if required, to interpret, results of those inspections or tests.

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

Visible Emissions: Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with amended water or diluted removal encapsulant and afterwards thoroughly decontaminated or disposed of as asbestos-contaminated waste.

Work Area: The area where asbestos-related work or removal operations are performed which is defined and/or isolated to prevent the spread of asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.1101.

Section 02 82 13.7 Industry Standards

Applicability of Standards: Except where Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into Contract Documents. Such standards are made a part of the Contract Documents by reference. Individual Sections indicate which codes and standards the Contractor must keep available at the Project Site for reference.

Section 02 82 13.8 Regulations – Hazardous Materials Abatement

The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local regulations pertaining to work practices, transportation, disposal, worker protection, visitors to the site, and persons occupying areas adjacent to the site. Except to the extent that more

explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, and standards have the same force and effect as if copied directly into the contract documents. The Owner's Onsite Representative, under the direction of the Owner, shall have discretion to stop work at the Contractor's expense where applicable regulations are not adhered.
Federal requirements which govern asbestos abatement work or transportation and disposal of asbestos waste material include but are not limited to the following:

a. 29 CFR 1910.134 - Respiratory Protection
b. 29 CFR 1910.1200 - Hazard Communication
c. 29 CFR 1910.145 - Specifications for Accident Prevention Signs and Tags
d. 29 CFR 1910.1001 - Asbestos, tremolite, anthophyllite, and actinolite
e. 29 CFR 1910.2 - Access to Employee Exposure and Medical Records
f. 29 CFR 1926.1101 - Construction Industry
g. 29 CFR 1926.58 - Asbestos, tremolite, anthophyllite, and actinolite
h. 40 CFR 61, Subpart A - National Emission Standard for Hazardous Air Pollutants
i. 40 CFR 61, Subpart M - National Emission Standards for Asbestos
j. 40 CFR 763.117 and 40 CFR 763.302 - Notification Requirements; Reportable Quantity Adjustments
k. 49 CFR 171 and 172 - Hazardous Substances

State requirements which govern asbestos abatement work or transportation and disposal of asbestos waste material include but are not limited to the following:

a. Chapter 3701-34, Ohio Administrative Code - Ohio Department of Health Asbestos Abatement Rules
b. Chapter 3710, Ohio Revised Code - Outline of the State of Ohio Asbestos Hazard Abatement Act

Notices: Notifications shall be sent by registered mail and filed electronically if applicable, return receipt requested; a copy of the return receipt indicating delivery to the appropriate office shall be provided to the Owner's Onsite Representaive prior to beginning any work.

Section 02 82 13.9 Air Monitoring – NOT IN CONTRACTOR'S WORK

This section describes air monitoring carried out by the Owner's Representative to verify that the building beyond the work area and the outside environment remains uncontaminated. This section also sets forth airborne fiber levels both inside and outside the work area as action levels, and describes the action required by the Contractor if an action level is met or exceeded. This work is not in the Contract Sum.

Air monitoring required by OSHA is the responsibility of the Contractor, but personnel air sample analysis can be performed by the Owner's Representative if authorization is given by the Owner. The Owner's Representative reserves the right to perform personal monitoring on Contractor personnel at his discretion, and take action based on results consistent with this specification.

Air Monitoring

Work Area Clearance: To determine if the elevated airborne fiber counts encountered during abatement operations have been reduced to an acceptable level, the Owner's Representative will sample and analyze air per Section 02 82 16.9 Work Area Clearance.

Analytical Methods

Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400A method. This method will be utilized by the Owner's Representative in analyzing the filters used to collect air samples. Samples will be collected on 25 mm. cassettes containing 0.8 micrometer mixed cellulose ester. The number and volume of air samples taken will be determined by the Owner's Representative. A complete record of all air monitoring and results will be furnished to the Owner, and the Contractor. Written reports of all air monitoring tests will be posted at the job site on a daily basis.

SECTION 02 82 16 ENGINEERING CONTROLS FOR ASBESTOS-CONTAINING MATERIALS

Section 02 82 16.1 Temporary Facilities

Provide and maintain temporary connection to existing building utilities or provide and maintain temporary facilities as required herein or as necessary to carry out the work. Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work. Require that tradesmen accomplishing this work be licensed as required by local authority for the work performed.

Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

Section 02 82 16.2 Materials and Equipment

Provide new or used materials and equipment that are undamaged and in serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards.

Scaffolding

Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA, State of Ohio and Local provisions. Equip rungs of all metal ladders, etc. with an abrasive non-slip surface. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.

During the erection and/or moving of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged. Clean as necessary debris from non-slip surfaces. At the completion of abatement work clean all construction aids within the work area, wrap in one layer of 6 mil polyethylene sheet and seal before removal from the Work Area.

Water Service

Temporary Water Service Connection: All connections to the building's water system shall include backflow protection provided by the Contractor. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment. All temporary water connections will be shut off on a daily basis before contractor leaves the work site.

Water Hoses: Employ heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

Hot Water: Hot water may not be available, therefore contractor will be responsible for providing their own temporary, portable hot water heater. All temporary systems must be equipped with backflow protection installed at point of connection as described in this section under Temporary Water Service connection.

Owner will assume cost for water use and Contractor will assume responsibility for water connection to Owner's existing potable water system. Contractor will supply hot and cold water to the Decontamination Unit in accordance with this specification. In addition, water shall be supplied for the following uses:

Maintain hose connections and outlet valves in leakproof condition. Where finish work below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. Drain water promptly from pans as it accumulates.

Electrical Services

General: Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service. Submit estimated maximum amperage needed.

Temporary Power: Provide and maintain service to Decontamination Unit sub-panel with minimum 60 amp, 2 pole circuit breaker or fused disconnect connected to the buildings main distribution panel. Sub-panel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.

Voltage Differences: Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.

Ground Fault Protection: Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate GFCI's exterior to Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.

Electrical Power Cords: Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas of work.

Lamps and Light Fixtures: Provide general service incandescent lamps or fluorescent lamps of wattage indicated or required for adequate illumination as required by the work or this section. Protect lamps with guard cages or tempered glass enclosures, where fixtures are exposed to breakage by construction operations. Provide vapor tight fixtures in work area and decontamination units. Provide exterior fixtures where fixtures are exposed to the weather or moisture.

Owner will assume cost for power usage and Contractor will assume responsibility for connection. Provide a weatherproof, grounded temporary electric power service and distribution system of

sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period. Install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of work.

Lockout: Lockout of all existing power to or through the work area as described below will be carried out by the Contractor with the assistance of the Owner. Unless specifically noted otherwise existing power and lighting circuits to the Work Area are not to be used. All power and lighting to the Work Area and Decontamination facilities are to be provided from temporary electrical panel described below.

Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. Label breakers with tape over breaker with notation "DANGER circuit being worked on." Lock panel and have all keys under control of Contractor or Owner's Representative.

Lockout power to circuits running through Work Area wherever possible by switching off all breakers serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on." Sign and date danger tag. Lock panel and supply keys to Contractor or Owner's Representative. If circuits cannot be shut down for any reason, label at intervals 4'-0" on center with tags reading, "DANGER live electric circuit. Electrocution hazard."

Temporary Electrical Panel: Provide temporary electrical panel sized and equipped to accommodate all electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical system. Protect with circuit breaker or fused disconnect. Locate temporary panel as directed by Contractor or Owner's Representative.

Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be at least exposed to damage from construction operations.

Circuit Protection: Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel. Do not use outlet type GFCI devices.

Temporary Wiring: in the Work Area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide liquid tight enclosures or boxes for wiring devices.

Number of Branch Circuits: Provide sufficient branch circuits as required by the work. All branch circuits are to originate at temporary electrical panel. At minimum provide the following:

- One circuit for each HEPA filtered fan unit
- For power tools and task lighting, provide one temporary 4-gang outlet in the following locations. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).
- One outlet in the work area for each 2500 square feet of work area
- One outlet at each decontamination unit, located in equipment room
- 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's Representative's use while conducting air sampling during the work as follows:
- One in each work area.

- One at clean side of each Decontamination Unit.
- Two outside work area in location designated by Owner's Representative.

Temporary Lighting

Lock out all existing power to lighting circuits in Work Area as described in Section 02 82 16.1 Temporary Facilities. Unless specifically noted otherwise existing lighting circuits to the Work Area are not to be used. All lighting to the Work Area and Decontamination facilities is to be provided from temporary electrical panel described above.

Provide the following or equivalent where natural lighting or existing building lighting does not meet the required light level:

One 200-watt incandescent lamp per 1000 square feet of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 50 feet. In stair ways and at ladder runs, provide one lamp minimum per story, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.

Provide lighting in areas where work is being performed as required.

Provide lighting in any area being subjected to a visual inspection as required.

Provide lighting in the Decontamination Unit as required.

Number of Lighting Circuits: Provide sufficient lighting circuits as required by the work. All lighting circuits are to originate at temporary electrical panel.

Circuit Protection: Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel.

Temporary Heat

Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from a branch circuit with ground fault circuit interrupter. Provide temporary heat where indicated or needed for performance of the Work. Maintain a minimum temperature of 50 degrees F. in the Work Area at all times.

First Aid

Comply with governing regulations and recognized recommendations within the construction industry.

Fire Extinguishers

Provide Type "ABC" dry chemical fire extinguishers that meet NFPA standards for all locations. Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers". Locate fire extinguishers where they are most convenient and effective for their intended purpose, but provide not less than one extinguisher in each Work Area in Equipment Room and One outside Work Area in Clean Room.

Section 02 82 16.3 Temporary Pressure Differential and Circulation System

The pressure differential between the Work Area and the building outside of the Work Area should be tested using the smoke tube test or equivalent verification method.

Submittals
Before Start of Work: Submit design of pressure differential system to the Owner's Representative for review.

- Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines
- Location of the machines in the Work Area
- Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power
- Description of work practices to insure that airborne fibers travel away from workers

HEPA Filtered Fan Units
General: Supply the required number of HEPA filtered fan units to the site in accordance with these specifications. Use units that meet the following requirements.

HEPA Filters: Provide units whose final filter is the HEPA type with the filter media (folded into closely pleated panels) completely sealed on all edges with a structurally rigid frame.

Prefilters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of prefiltration are required. Provide units with the following prefilters:

- First-stage prefilter: low-efficiency type (e.g., for particles 100 um and larger)
- Second-stage (or intermediate) filter: medium efficiency (eg., effective for particles down to 5 um)

Provide units with prefilters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps.

Safety and Warning Devices: Provide units with the following safety and warning devices:

- Electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter
- Automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge
- Warning lights to indicate normal operation (green), too high a pressure drop across the filters (i.e., filter overloading) (yellow), and too low of a pressure drop (i.e., rupture in HEPA filter or obstructed discharge) (red)
- Audible alarm if unit shuts down due to operation of safety systems

Electrical components: Provide units with electrical components approved by the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL). Each unit is to be equipped with overload protection sized for the equipment. The motor, fan, fan housing, and cabinet are to be

grounded.

Pressure Differential Isolation

Isolate the Work Area from all adjacent areas or systems of the building with a Pressure Differential that will cause a movement of air from outside to inside at any breach in the physical isolation of the Work Area.

Relative Pressure in Work Area: Continuously maintain the work area at an air pressure that is lower than that in any surrounding space in the building, or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of 0.02 inches of water.

Accomplish the pressure differential by exhausting a sufficient number of HEPA filtered fan units from the work area. The number of units required will depend on machine characteristics, the seal at barriers, and required air circulation. The number of units will increase with increased make-up air or leaks into the Work Area. Determine the number of units required for pressure isolation by the following procedure:

- Establish required air circulation in the work area and personnel decontamination units.
- Exhaust a sufficient number of units from the work area to develop the required pressure differential.
- The required number of units is the number determined above plus one additional unit.

Vent HEPA filtered fan units to outside of building unless authorized in writing by Owner's Representative.

Isolation of return air ductwork: Return air duct work which must be kept operating may be located in the Work Area. This duct work must be isolated from the Work Area.

Wrap the duct with 6 mil polyethylene. Seal all polyethylene seams with spray glue and duct tape.

Air Circulation in the Work Area

Air Circulation: For purposes of this section air circulation refers to either the introduction of outside air to the Work Area or the circulation and cleaning of air within the Work Area.

Air circulation in the Work Area is a minimum requirement intended to help maintain airborne fiber counts at a level that does not significantly challenge the work area isolation measures. The Contractor may also use this air circulation as part of the engineering controls in his worker protection program.

Determining the Air circulation Requirements: Provide a fully operational air circulation system supplying a minimum of 4 air changes per hour.

Determine Number of Units needed to achieve required air circulation according to the following procedure:

Determine the volume in cubic feet of the work area by multiplying floor area by ceiling height. Determine total air circulation requirement in cubic feet per minute (CFM) for the work area by multiplying this volume by the air change rate and dividing by 60.

Air Circulation Required in CFM = $\frac{\text{Vol of work area (cu. ft.) * Number of air changes/hr}}{\text{60 minutes per hour}}$

Divide the air circulation requirement (CFM) above by capacity of HEPA filtered fan unit(s) used. Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics.

Number of Units Needed = $\frac{\text{Air circulation Requirement (CFM)}}{\text{Capacity of Unit with Loaded Filters (CFM)}}$

Add one (1) additional unit as a backup in case of equipment failure or machine shutdown for filter changing.

Exhaust System

Pressure differential isolation and air circulation in the Work Area are to be accomplished by an exhaust system as described below.

Exhaust all units from the Work Area to meet air circulation requirement of this section.

Location of HEPA Filtered Fan Units: Locate fan unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the HEPA filtered fan unit(s) at a maximum distance from the worker access opening or other makeup air sources.

Place at end of unit an intake duct or its exhaust duct through an opening in the plastic barrier or wall covering. Seal plastic around the unit or duct with tape.

Vent to outside of building, unless authorized by the Owner's Representative.

Decontamination Units: Arrange Work Area and decontamination units so that the majority of make up air comes through the Decontamination Units.

Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Owner's Representative by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Cover with flaps to reseal automatically if the pressure differential system should shut down for any reason. Spray flap and around opening with spray adhesive so that if flap closes meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry.

Air Circulation in Decontamination Units

Pressure Differential Isolation: Continuously maintain the pressure differential required for the work area in the:

Personnel Decontamination Unit: Across the Shower Room with the Equipment Room at a lower pressure than the Clean room.

Air Circulation: Continuously maintain air circulation in Decontamination Units at same level as required for Work Area.

Air Movement: Arrange air circulation through the Personnel Decontamination Unit so that it produces a movement of air from the Clean Room through the Shower Room into the Equipment Room.

Use of the Pressure Differential and Air Circulation System

Each unit shall be serviced by a dedicated minimum 115V-20A circuit with ground fault circuit interrupter (GFCI) supplied from temporary power supply installed under requirements of Section 02 82 16.1 Temporary Facilities." Do not use existing branch circuits to power fan units.

Testing the System: Test pressure differential system before any asbestos-containing material is wetted or removed. After the Work Area has been prepared, the decontamination facility set up, and the fan unit(s) installed, start the unit(s) (one at a time). Demonstrate operation and testing of pressure differential system to Owner's Representative.

Demonstrate Operation of the pressure differential system to the Owner's Representative will include, but not be limited to, the following:

Plastic barriers and sheeting move lightly in toward Work Area.

Curtain of decontamination units move lightly in toward Work Area.

There is a noticeable movement of air through the Decontamination Unit.

Use smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room.

Use smoke tubes to demonstrate a definite motion of air across all areas in which work is to be performed.

Modify the pressure differential system as necessary to demonstrate successfully the above.

Use of System During Abatement Operations:

Start fan units before beginning work (before any asbestos-containing material is disturbed). After abatement work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.

Do not shut down air pressure differential system during encapsulating procedures, unless authorized by the Owner's Representative in writing. Supply sufficient pre-filters to allow frequent changes.

Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and fan units are operating again.

At completion of abatement work, allow fan units to run as specified under Section 02 82 16.9 Work Area Clearance, to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

Dismantling the System:

When a final inspection and the results of final air tests indicate that the area has been decontaminated, fan units may be removed from the Work Area. Before removal from the Work Area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 6 mil polyethylene to prevent environmental contamination from the filters.

Section 02 82 16.4 Temporary Enclosures

Sheet Plastic

Polyethylene Sheet: A single flame resistant polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil thick as indicated, clear, frosted, or black as indicated. In some cases, 4-mil polyethylene sheeting may be used.

Reinforced Polyethylene Sheet: Where plastic sheet constitutes the only barrier between the work area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil thick as indicated, frosted or black as indicated.

Miscellaneous Materials

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

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

Carry out work of this section sequentially. Complete each activity before proceeding to the next.

General Procedures

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

Completely isolate the Work Area from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas in accordance with the procedures indicated in Section 02 82 16.8 Project Decontamination. Perform all such required cleaning or decontamination at no additional cost to owner.

Place all tools, scaffolding, staging, etc. necessary for the work in the area to be isolated prior to completion of Work Area isolation.

Remove all removable furniture that has been designated uncontaminated by the Contract Documents or Owner's Representative. Also remove uncontaminated equipment, and/or supplies from the Work Area before commencing work, or completely cover with two (2) layers of polyethylene sheeting, at least 6 mil in thickness, securely taped in place with duct tape. Such furniture and equipment shall be considered outside the work area unless covering plastic or seal is breached.

Disable ventilating systems or any other system bringing air into or out of the Work Area. Disable system by disconnecting wires, removing circuit breakers, by lockable switch or other positive means that will prevent accidental premature restarting of equipment.

Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of Contractor's Superintendent or Owner's designated Representative.

Lockout power to circuits running through work area wherever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on". If circuits cannot be shut down for any reason, label at intervals 4'-0" on center with tags reading, "DANGER live electric circuit." Label circuits in hidden locations but which may be affected by the work in a similar manner.

Emergency Exits: Provide emergency exits from the work area with the following means for emergency exiting. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work area.

Control Access

Isolate the Work Area to prevent entry by building occupants into Work Area or surrounding controlled areas. Accomplish isolation by the following:

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

Provide Warning Signs at each locked door leading to Work Area reading as follows:

Print text in both English and Spanish if applicable:

Legend	Notation
KEEP OUT	3" Sans Serif Gothic or Block
BEYOND THIS POINT **ASBESTOS ABATEMENT WORK** **IN PROGRESS**	1" Sans **Serif** Gothic or Block
BREATHING ASBESTOS DUST MAY BE HAZARDOUS TO YOUR HEALTH	14 Point Gothic

Immediately inside door and outside critical barriers post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA

Provide spacing between respective lines at least equal to the height of the respective upper line.

Respiratory and Worker Protection

Before proceeding beyond this point in providing Temporary Enclosures:

Provide Worker Protection per Section 02 82 21

Provide Respiratory Protection per Section 02 82 21

Provide Personnel Decontamination Unit per Section 02 82 16.6

Critical Barriers

Completely Separate the Work Area from other portions of the building, and the outside by closing all openings with sheet plastic barriers at least 6 mil in thickness, or by sealing cracks leading out of Work Area with duct tape.

Individually seal or remove as specified, all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, and other openings into the Work Area with duct tape alone or with polyethylene sheeting at least 6 mil in thickness, taped securely in place with duct tape. Maintain seal until all work including Project Decontamination is completed. Take care in sealing of lighting fixtures to avoid melting or burning of sheeting.

Provide Sheet Plastic barriers at least 6 mil in thickness as required to seal openings completely from the Work Area into adjacent areas. Seal the perimeter of all sheet plastic barriers with duct tape or spray cement.

Provide Pressure Differential System per Section 02 82 16.3.

Prepare Work Area
Clean all contaminated furniture, equipment, and or supplies with a HEPA filtered vacuum cleaner or by wet cleaning prior to being moved or covered. All equipment furniture, etc. is to be deemed contaminated unless specifically declared as uncontaminated on the drawings or in writing by the Owner's Representative.

Clean All Surfaces In Work Area with a HEPA filtered vacuum or by wet wiping prior to the installation of primary barrier.

Primary Barrier
Protect building and other surfaces in the Work Area from damage from water and high humidity or from contamination from asbestos-containing debris, slurry or high airborne fiber levels by covering with a primary barrier as described below.

Sheet Plastic: Protect the work area with two (2) layers of plastic sheeting on the floor and walls, or as otherwise directed in writing by the Owner's Representative. Perform work in the following sequence.

Install Critical barriers in work area.

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

Isolation Area
Maintain isolation areas between the Work Area and adjacent building area in unoccupied rooms located between Work Area and adjacent occupied portions of the building.

Form isolation area by controlling access to the space in the same manner as a Work Area. Physically isolate the space from the Work Area and adjacent areas. Accomplish physical isolation by installing critical barriers in unoccupied space.

Stop Work
If the Critical or Primary barrier is breached in any manner stop work immediately. Do not start work until authorized by the Owner's Representative.

Extension of Work Area
If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, then add affected area to the Work Area, enclose it as required by this Section of the specification and decontaminate it as described in Section 02 82 16.8 Project Decontamination.

Section 02 82 16.5 Regulated Areas

Work of this section consists of preparing a Regulated Area. Do not use procedures set forth in this section in connection with any other work.

Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil thick, clear, frosted, or black as indicated.

Secure work area from access by occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area, or by constructing temporary wood stud and plywood barriers.

Demarcation of Regulated Area
Demarcate each Regulated Area with a sheet plastic drop sheet as described below.

Post warning signs that carry the following legends:

First Sign:

Provide warning signs at each locked door leading to the controlled area reading as follows:

Legend	Notation
KEEP OUT	3 inch Block

Second Sign:

Immediately inside the locked door and outside the controlled area post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101:

Legend:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

Where the controlled area is in a large area such as on part of a boiler room or open office area, delineate area with 3-inch wide polyethylene ribbon with the printed warning, "DANGER ASBESTOS REMOVAL". Install this ribbon at between 3 and 4 feet above the floor.

General Procedures

The following precautions and procedures have application to work of this section. Workers must exercise caution to avoid release of asbestos fibers into the air:

Setup and management of the controlled area is to be under the supervision of an OSHA Competent Person as described in Section 02 82 13.4 General Site and Project Requirements.

Before start of work comply with requirements for worker protection & respiratory protection in sections 02 82 21.

Do not allow eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in the Regulated Area.

Shut down any air handling equipment bringing air into or out of the Regulated Area.

Clean any existing dust or debris from the floor and walls, and other surface in the immediate location of the work prior to commencing work by damp-mopping or by use of a High Efficiency Particulate Air (HEPA) filtered vacuum.

Cover floor of regulated area with a 6 mil polyethylene sheet.

Seal all openings, supply and exhaust vents, and convectors within ten (10) feet of the Work Area with 6 mil polyethylene sheeting secured and completely sealed with duct tape.

Perform the work per the appropriate specification section while on plastic drop sheet.

Immediately remove any asbestos-containing debris which collects on the drop sheet either by using a HEPA vacuum or by spraying with amended water or removal encapsulant, collecting with wet paper towels, placing in a clear (see-through) disposal bag while still wet, and cleaning surface of plastic sheet with wet paper towels.

Complete the following at completion of work in an area before stepping off drop sheet.

While standing on plastic sheet thoroughly HEPA vacuum ladder and any tools used and pass to worker standing off sheet.

The worker standing off the sheet will thoroughly HEPA vacuum the worker standing on the sheet.

The worker on the sheet will thoroughly HEPA vacuum all surfaces of the plastic sheet, bags, and any other items on the sheet including his own feet.

If moving to the next Work Area in the same secured area: The worker on the drop sheet is to don clean foot covers, placing each foot, in turn, off the sheet as the foot cover is put on. The clean foot covers will be removed at the next Work Area while standing on the sheet. Dispose of the used foot

covers along with the plastic sheet at completion of work in that area. Do not reuse foot covers to move off the sheet.

If work day is complete or if next Work Area is in another secured area, all workers will remove Tyvek suits turning them inside out while doing so. The person on the sheet will step with each foot off the sheet as the foot covers are removed.

Fold sheet and all its contents toward the center.

Place the sheet in a properly labeled clear (see-through) disposal bag.

Collapse bag with a HEPA vacuum, and properly seal.

Clean all surfaces of the Work Area by use of a HEPA filter vacuum until no visible residue remains.

Removal
At completion of work require all workers to complete wet decontamination procedures for the containment in accordance with Section 02 82 16.8 Project Decontamination.

Section 02 82 16.6 Decontamination Units

Provide a Personnel Decontamination Unit to be the only means of ingress and egress for the Work Area, unless otherwise indicated. Equipment and waste material can be decontaminated through this unit if authorized by Owner's Representative.

Submittals
Before the Start of Work: Review the following with the Owner's Representative prior to the start of work.

Personnel Decontamination Unit: Provide shop drawing showing location and assembly of personnel decontamination units.

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

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

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

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

Primary Filter - Passes particles 20 microns and smaller
Secondary Filter - Passes particles 5 microns and smaller

Personnel Decontamination Unit

Where required, provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces, Changing Room, Shower Room, Equipment Room. Require all persons without exception to pass through this Decontamination Unit for entry into and exiting from the Work Area for any purpose. Do not allow parallel routes for entry or exit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 100 foot candles.

Changing Room (clean room): Provide a room that is physically and visually separated from the rest of the building for the purpose of changing into protective clothing.

Construct using polyethylene sheeting, at least 6 mil in thickness, to provide an airtight seal between the Changing Room and the rest of the building.

Locate so that access to Work Area from Changing Room is through Shower Room.

Separate Changing Room from the building by a sheet plastic flapped doorway.

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

An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workers may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic as set forth in Section 02 82 16.4 Temporary Enclosures. Authorization for this must be obtained from the Owner's Representative in writing prior to start of construction.

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

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

Provide posted information for all emergency phone numbers and procedures.

Airlock: Provide an airlock between Shower Room and Changing Room. This is a transit area for workers.

Separate this room from Drying Room and Changing Room by sheet plastic flapped doorways.

Drying Room: Provide a drying room as an airlock and a place for workers to dry after showering.

Construct room by providing a pan continuous with or draining to Shower Room pan. Install a freely draining wooden or non-skid metal floor in pan at elevation of top of pan.

Separate this room from the rest of the building with airtight walls fabricated of 6 mil polyethylene.

Separate from Changing Room by a sheet plastic flapped doorway.

Provide a continuously adequate supply of disposable bath towels.

Shower Room: Provide a completely watertight operational shower to be used for transit by cleanly dressed workers heading for the Work Area from the Changing Room, or for showering by workers headed out of the Work Area after undressing in the Equipment Room.

Construct room by providing a shower pan and 2 shower walls in a configuration that will cause water running down walls to drip into pan. Install a freely draining wooden floor in shower pan at elevation of top of pan.

Provide splashproof entrances to Drying Room and Airlock with doors.

Provide shower head and controls.

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

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

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

Arrange water shut off and drain pump operation controls so that a single individual can shower without assistance from either inside or outside of the Work Area.

Provide flexible hose shower head.

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

Airlock: Provide an airlock between Shower Room and Equipment Room. This is a transit area for workers. Separate this room from Equipment Room by a sheet plastic flap doorway.

Separate from Equipment Room by a sheet plastic flapped doorway.

Equipment Room (contaminated area): Require work equipment, footwear and additional contaminated work clothing to be left here. This is a change and transit area for workers.

Separate this room from the Work Area by a 6 mil polyethylene flapped doorway.

Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift

change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

Airlock: Provide an airlock between Equipment Room and Work Area. This is a transit area for workers.

Separate this room from Equipment Room and Work Area by a sheet plastic flapped doorways.

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

Decontamination Sequence: Require that all workers adhere to the following sequence when entering or leaving the Work Area. Adjustments may be necessary to accommodate for double suiting procedures, where authorized.

Entering Work Area: Worker enters Changing Room and removes street clothing, puts on clean disposable overalls and respirator, and passes through the Shower Room into the Equipment Room.

Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room. Worker proceeds to Work Area.

Exiting Work Area:

Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment.

Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Equipment Room. Disposable coveralls are placed in a clear (see-through) bag for with other material.

Require that Decontamination procedures found in Section 02 82 16.6 be followed by all individuals leaving the Work Area. After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

Cleaning of Decontamination Unit

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

Signs

Post an approximately 20 inch by 14 inch manufactured caution sign at each entrance to the Work Area

displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926.1101: (Provide signs in both English and Spanish if applicable)

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA

Provide spacing between respective lines at least equal to the height of the respective upper line.

Section 02 82 16.7 Project Closeout

This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

Inspection procedures.
Final cleaning.

Contract Completion

Preliminary Procedures:

Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the work claimed as substantially complete. Include supporting documents for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the work is not complete.

Advise Owner of pending insurance change over requirements.

Inspection Procedures: On receipt of a request for inspection, the Owner's Representative will either proceed with inspection or advise the Contractor of unfilled requirements. The Owner's Representative will release the Contractor from the project site, or advise the Contractor of construction that must be completed or corrected before being released.

The Owner's Representative will repeat inspection when requested and assured that the work has been substantially completed.

Results of the completed inspection will form the basis of requirements for final acceptance.

Final Acceptance

Preliminary Procedures: Before requesting final inspection and Final Payment, complete the following. List exceptions in the request.

Submit the Final Payment Request and supporting documentation not previously submitted and accepted.

Submit an updated final statement, accounting for final additional changes to the Contract Sum.

Reinspection Procedure: The Owner's Representative will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Owner's Representative.

Upon completion of reinspection, the Owner's Representative will release the Contractor from the project site. If necessary, reinspection will be repeated.

Final Cleaning

General: General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".

Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

Remove labels that are not permanent labels.

Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition.

Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean remaining fixtures to a sanitary condition.

Clean the site, including landscape development areas, of rubbish, litter and foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

Removal of Protection: Remove temporary protection and facilities installed for protection of the work during construction.

Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

Section 02 82 16.8 Project Decontamination

Work of this section includes the decontamination of air in the Work Area which has been, or may have been, contaminated by the elevated airborne asbestos fiber levels generated during abatement activities, or which may previously have had elevated fiber levels due to friable asbestos-containing materials in the space.

Work of This Section includes the cleaning, decontamination, and removal of temporary facilities installed prior to abatement work, including:

Primary and Critical Barriers erected by work of Section 02 82 16.5 Regulated Areas

Decontamination Unit erected by work of Section 02 82 16.6 Decontamination Units

Pressure Differential System installed by work of Section 02 82 16.3 Temporary Pressure Differential and Circulation System

Work of this section includes the cleaning, and decontamination of all surfaces (ceiling, walls, and floor) of the Work Area, and all furniture or equipment in the Work Area.

Start of Work: Work of this section begins with the removal of the Primary Barrier. At start of work the following will be in place:

Critical Barrier: An airtight barrier between the Work Area and other portions of the building or the outside.

Critical Barrier Sheeting: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers and other openings.

Decontamination Units: For personnel in operating condition.

Pressure Differential System: In operation.

Cleaning

Cleaning: Carry out cleaning of all surfaces of the work area including items of remaining sheeting, tools, scaffolding and/or staging by use of damp-cleaning and mopping, and/or a High Efficiency Particulate Air (HEPA) filtered vacuum. (Note: A HEPA vacuum may fail if used with wet material.) Do not perform dry dusting or dry sweeping. Use each surface of a cleaning cloth one time only and then dispose of as contaminated waste. Continue this cleaning until there is no visible debris from removed materials or residue on plastic sheeting or other surfaces.

Remove All Filters in Air Handling System(s) and dispose of as asbestos-containing waste in accordance with requirements of Section 02 82 33.1 Disposal of Asbestos Containing Waste Material.

Wait Four Air Changes to allow HEPA filtered fan units to clean air of airborne asbestos fibers. Use

oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain Pressure Differential System in operation for the entire 4 air change period.

Encapsulation of substrate: The use of an encapsulant, encapsulating agent or lockdown agent prior to the satisfactory completion of the visual inspection by the Owner's Representative is strictly prohibited. Perform encapsulation of work area using a clear encapsulant. Surfaces to be covered have met the requirements for a visual inspection in this section. Maintain Pressure Differential System in operation during encapsulation work.

Once encapsulation is complete, wait for 4 air changes to be completed in the work areas before conducting final air clearance sampling. At the completion of encapsulation, the following will be in place:

Critical Barrier: Which forms the sole barrier between the Work Area and other portions of the building or the outside.

Critical Barrier Sheeting: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers, and other openings.

Decontamination Unit: For personnel, in operating condition.

Pressure Differential System: Maintain in continuous operation.

Lockback

Encapsulation of substrate: Perform encapsulation where required, before Removal of Work Area Isolation as specified below. Maintain Pressure Differential System in operation during encapsulation work.

Removal of Work Area Isolation

After all requirements of this section and Section 02 82 16.9 Work Area Clearance have been met:

Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

Remove Personnel Decontamination Unit.

Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Owner's Representative, are found then the entire area affected shall be decontaminated as specified in Section 02 82 16.5 Regulated Areas.

Remove all equipment, materials, debris from the work site.

Dispose of all asbestos-containing waste material as specified in Section 02 82 33.1 Disposal of Asbestos Containing Waste Material.

Substantial Completion of Abatement Work

Asbestos abatement work is substantially complete upon meeting the requirements of this section and Section 02 82 16.9 Work Area Clearance, including submission of:

Certificate of Visual Inspection

Receipts Documenting proper disposal as required by Section 02 82 33.1 Disposal of Asbestos-Containing Waste Material.

Punch list detailing repairs to be made and incomplete items.

Certificate of Visual Inspection

Following this section is a "Certificate of Visual Inspection". This certification is to be completed by the Contractor and certified by the Project Administrator. Submit completed Certificate with Application for Final Payment. Final payment will not be made until this Certification is executed.

CERTIFICATION OF VISUAL INSPECTION

Client: _____
Project: _____

Area of Visual Inspection:
_____
_____
_____

Contractor's Representative Signature: _____
Date: _____
Printed Name: _____
Title: _____

In accordance with Section 02 82 16.8 "Project Decontamination" the certified individual hereby certifies that they have visually inspected the entire Work Area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, decontamination unit, sheet plastic, etc.) and has found no dust, debris or residue.

Certified Individual Signature: _____
Date: _____
Printed Name:_____
Certification Number: _____

Please circle type of certification: CAHES CAHAMT CIH IHIT

Section 02 82 16.9 Work Area Clearance

Not in Contract Sum: This section describes work being performed by the Owner. This work is not in the Contract Sum.

This Section sets forth required post-abatement airborne asbestos concentrations in the Work Area and describes testing procedures the Owner will use to measure these levels.

Contractor Release Criteria
The asbestos abatement work area is cleared when the Work Area is visually clean and airborne asbestos structure concentrations have been reduced to specified clearance levels for Non-aggressive PCM sampling as specified in the SUMMARY OF WORK for each individual Work area.

Visual Inspection
Work of this Section will not begin until the visual inspection described in Section 02 82 16.8 Project Decontamination is complete and has been certified by the Project Administrator.

Air Monitoring
To determine if the elevated airborne asbestos structure concentration encountered during abatement operations has been reduced to the specified level, the Owner's Representative will secure samples and have them analyzed according to clearance criteria.

Schedule of Air Samples
General: The number and volume of air samples taken and analytical method used will be in accordance with PCM final clearance sampling and analysis protocol.

PCM Air Sampling Protocol
In each homogeneous Work Area after completion of all cleaning work, a minimum of three samples will be taken according to the following protocol, unless otherwise indicated:

A minimum of three samples per abatement area for areas scheduled for demolition.

Two field blanks are to be taken by removing the cap for not more than 30 seconds and replacing it at the time of sampling before sampling is initiated at the following places:

Near the entrance to each abatement area.
At one of the ambient sites. (Do not leave the field blanks open during the sampling period.)

Analysis: PCM analysis will be conducted in accordance with the NIOSH 7400A method for fibers.
Release Criteria: Decontamination of the work site is complete when the concentration of asbestos of all three air samples within the abated area is less than or equal to 0.01 fibers per cubic centimeter. If these criteria are not met, then the decontamination is incomplete and recleaning per section 02 82 16.8 Project Decontamination is required.

If initial final air clearance sample results do not meet clearance criteria the Contractor will be responsible for all fees related to further cleaning, clearance sampling, and analysis.

SECTION 02 82 19 WORKER PROTECTION

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

Worker Training

State and Local License: All workers are to be trained, certified and accredited as required by state or local code or regulation.

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

Methods of recognizing asbestos

Health effects associated with asbestos

Relationship between smoking and asbestos in producing lung cancer

Nature of operations that could result in exposure to asbestos

Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:

Engineering controls
Work Practices
Respirators
Housekeeping procedures
Hygiene facilities
Protective clothing
Decontamination procedures
Emergency procedures
Waste disposal procedures

Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134

Appropriate work practices for the work
Requirements of medical surveillance program
Review of 29 CFR 1926, OSHA General Construction Standard
Pressure Differential Systems
Work practices including hands on or on-job training
Personal Decontamination procedures
Air monitoring, personal and area

Medical Examinations

Provide medical examinations for all workers who may encounter an airborne fiber level of 0.1 f/cc or greater for an 8 hour Time Weighted Average. In the absence of specific airborne fiber data provide medical

examinations for all workers who will enter the Work Area for any reason. Examination shall as a minimum meet OSHA requirements as set forth in 29 CFR 1926.1101. In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

Submittals

Before Start of Work: Submit the following to the Owner's Representative for review.

State and Local License: Submit evidence that all workers have been trained, certified and accredited as required by state or local code or regulation.

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

- Name and unique identification number
- Physicians Written Opinion from examining physician including at a minimum the following:
- Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to asbestos.
- Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
- Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
- Copy of information that was provided to physician in compliance with 29 CFR 1926
- Statement that worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat stress in the worker.

Protective Clothing

Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area.

Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protection, for all workers. Provide boots at no cost to workers. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with asbestos-containing material. Dispose of boots as asbestos-contaminated waste at the end of the project.

Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.

Additional Protective Equipment

Respirators, disposable coveralls, head covers, and footwear covers shall be provided and maintained by the Contractor for the Owner, Owner's Representative, Project Administrator, and other authorized representatives who may inspect the job site. Provide and maintain two (2) respirators and six (6) complete coveralls and, where applicable, six (6) respirator filter changes per day.

Full Containment Procedures

Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the

work. The following procedures are minimums to be adhered to regardless of fiber count in the Work Area.

Each time Work Area is entered remove all street clothes in the Changing Room of the Personnel Decontamination Unit and put on new disposable coverall, new head cover, and a clean respirator. Proceed through shower room to equipment room and put on work boots.

Decontamination Procedures

At this site, a contiguous decontamination unit will be established for all work.

Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:

Powered Air-Purifying Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area:

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

Still wearing respirators, proceed to showers. Showering is mandatory for most areas. Care must be taken to follow reasonable procedures in removing the respirator to avoid asbestos fibers while showering. The following procedure is required as a minimum, unless otherwise indicated:

Thoroughly wet body including hair and face. If using a Powered Air-Purifying Respirator (PAPR) hold blower unit above head to keep canisters dry.

With respirator still in place thoroughly wash body, hair, respirator face piece, and all parts of the respirator except the blower unit and battery pack on a PAPR. Pay particular attention to seal between face and respirator and under straps.

Take a deep breath, hold it and/or exhale slowly, completely wet hair, face, and respirator. While still holding breath, remove respirator and hold it away from face before starting to breath.

Carefully wash facepiece of respirator inside and out.

If using PAPR: shut down in the following sequence, first cap inlets to filter cartridges, then turn off blower unit (this sequence will help keep debris which has collected on the inlet side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.

Shower completely with soap and water.

Rinse thoroughly.

Rinse shower room walls and floor prior to exit.

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

Air Purifying-Negative Pressure Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area with a half or full face cartridge type respirator:

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

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

Thoroughly wet body from neck down.

Wet hair as thoroughly as possible without wetting the respirator filter if using an air purifying type respirator.

Take a deep breath, hold it and/or exhale slowly, complete wetting of hair, thoroughly wetting face, respirator and filter (air purifying respirator). While still holding breath, remove respirator and hold it away from face before starting to breath.

Dispose of wet filters from air purifying respirator.

Carefully wash facepiece of respirator inside and out.

Shower completely with soap and water.

Rinse thoroughly.

Rinse shower room walls and floor prior to exit.

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

Within Work Area:

Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. To eat, chew, drink or smoke, workers shall follow the procedure described above, then dress in street clothes before entering the non-Work Areas of the building.

SECTION 02 82 21 RESPIRATORY PROTECTION

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

Standards

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

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

CGA - Compressed Gas Association, Inc., New York, Pamphlet G-7, "Compressed Air for Human Respiration", and Specification G-7.1 "Commodity Specification for Air".

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

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

NIOSH - National Institute for Occupational Safety and Health.

MSHA - Mine Safety and Health Administration.

Submittals

Before Start of Work submit the following to the Owner's Representative for review.

Product Data: Submit manufacturer's product information for each component used, including NIOSH Certifications for each component in an assembly and/or for entire assembly.

Respiratory Protection Program: Submit Contractor's written respiratory protection program manual as required by OSHA 1926.1101.

Historic Airborne Fiber Data (if applicable): Submit airborne asbestos fiber count data from an independent air monitoring firm to substantiate selection of respiratory protection proposed. Data submitted shall include at least the following for each procedure required by the work:

Date of measurements

Operation monitored

Sampling and analytical methods used and evidence of their accuracy

Number, duration, and results of samples taken

Fit Test Results: Submit to Owner's Representative current Fit Test result Forms for Contractor's employees. Qualitative Fit testing should be performed every twelve months.

Respiratory Protection Program: Comply with ANSI Z88.2 - 1980 "Practices for Respiratory Protection" and OSHA 29 CFR 1910 and 1926.

Require that respiratory protection be used at all times that there is any possibility of disturbance of asbestos-containing materials whether intentional or accidental.

Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until the area has been cleared for re-occupancy in accordance with Section 02 82 16.9.

Regardless of Airborne Fiber Levels: Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.

Do not allow the use of single-use, disposable, or quarter-face respirators for any purpose.

Fit Testing

Initial Fitting: Provide initial fitting of respiratory protection during a respiratory protection course of training set up and administered by a qualified technician. Fit types of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing has been provided. Fit test results within last twelve months for employees should be on file in the Respiratory Protection program.

Upon Each Wearing: Require that each time an air-purifying respirator is put on it be checked for fit with a positive and negative pressure fit test in accordance with the manufacturer's instructions or ANSI Z88.2 (1980).

Type of Respiratory Protection Required

Provide Respiratory Protection as indicated in paragraph below. Where paragraph below does not apply, determine the proper level of protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the permissible exposure limit (PEL) is the minimum level of protection allowed.

Permissible Exposure Limit (PEL)

8-Hour Time Weighted Average (TWA) of asbestos fibers to which any worker may be exposed shall not exceed the following.

Fibers: For purposes of this section, fibers are defined as all fibers regardless of composition as counted in the OSHA Reference Method (ORM), or NIOSH 7400 procedure.

Time Weighted Average (TWA) - 0.1 fibers/cubic centimeter

Respiratory Protection Factor

Respirator Type	Protection Factor
Half facepiece negative pressure respirator w/HEPA filter	10
Full facepiece Negative pressure respirator w/HEPA filter	50
Powered Air Purifying (PAPR):	50
Half or Full facepiece positive pressure respirator w/ HEPA filter	
Type C supplied air:	1,000
Half facepiece positive pressure respirator, Pressure demand or other positive pressure mode	
Type C supplied air:	2,000
Full facepiece positive pressure respirator pressure demand or other positive pressure mode	
Type C supplied air:	10,000
Positive pressure respirator pressure demand or other positive pressure mode Full facepiece equipped with an auxiliary positive pressure Self-contained breathing apparatus (SCBA)	
Self-contained breathing apparatus (SCBA):	10,000
Positive pressure respirator pressure demand or other positive pressure mode full facepiece	

Air Purifying Respirators

Negative pressure - half or full face mask: Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the work day. Require that respirators be wet-rinsed, and filters discarded, each time a worker leaves the Work Area. Require that new filters be installed each time a worker re-enters the Work Area. Store respirators and filters at the job site in the changing room and protect totally from exposure to asbestos prior to their use.

Powered air purifying - half or full face mask: Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement. Require that regardless of flow, filter cartridges be replaced after 40 hours of use. Require that HEPA elements in filter cartridges be protected from wetting during showering. Require entire exterior housing of respirator, including blower unit, filter cartridges, hoses, battery pack, face mask, belt, and cords, be washed each time a worker leaves the Work Area. Caution should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

Respirator Bodies: Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit.

Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z228.2 (1980). In addition, a chemical cartridge section may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate code and NIOSH Certification.

Non-permitted respirators Do not use single use, disposable or quarter face respirators.

Installation of Critical and Primary Barriers, and Work Area Isolation Procedures are set forth in Section 02 82 16.4 Temporary Enclosures.

Disposal of asbestos-containing waste is specified in Section 02 82 33.1 Disposal of Asbestos-Containing Waste Material.

Submittals
Before Start of Work: Submit the following to the Owner's Representative for review.

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

Products
Wetting Materials: For wetting prior to disturbance of Asbestos-Containing Materials use either amended water or a removal encapsulant:

Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of Asbestos-Containing Material. Use a material which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50% polyoxyethylene ester and 50% polyoxyethylene ether in five gallons of water.

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

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

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

Bags:
Provide clear (see-through) 6 mil thick leak-tight polyethylene bags labeled as required by Section 02 82 33.1 Disposal of Asbestos Containing Waste Material.

Worker Protection

Before beginning work with any material for which a Material Safety Data Sheet has been submitted provide workers with the required protective equipment. Require that appropriate protective equipment be used at all times.

Wet Removal

Adequately wet, as defined by the USEPA, all Asbestos-Containing Materials to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water or removal encapsulant to penetrate material thoroughly. If amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions. Where necessary, carefully strip away while simultaneously spraying amended water or removal encapsulant on the installation to minimize dispersal of asbestos fibers into the air.

Mist work area continuously with amended water whenever necessary to reduce airborne fiber levels.

Remove saturated Asbestos-Containing Material in small sections from all areas. Do not allow material to dry out. As it is removed, simultaneously pack material while still adequately wet as defined by the USEPA into clear (see-through) disposal bags. Twist neck of bags, bend over and seal with minimum three wraps of duct tape. Clean outside and move to Wash Down Station adjacent to Decontamination Unit.

Active Electrical Equipment: Do not wet materials in the vicinity of active electrical equipment. Notify Owner's Representative immediately if this situation or similar situations are encountered.

Warning Signs: Post warning signs at the entry point to active electrical equipment as required by OSHA or other applicable regulation.

Personnel who work on active electrical equipment is to be performed by qualified tradespersons with prior experience in the installation or repair of the involved equipment. Restrict access to electrical equipment.

Electrical Isolation:
Cover exposed conductors with a minimum 1/8" thick neoprene blanket draped over the conductor and surrounding area.

Protective Equipment:
Provide workers working on or in the vicinity of active electrical with appropriate protective equipment including insulating gloves, boots, and non-conductive tools.

Section 02 82 33.1 Disposal of Asbestos Containing Waste Material

This section describes the disposal of Asbestos-Containing Materials. Disposal includes packaging of asbestos-containing waste materials. Disposal may be accomplished either by landfilling or converting asbestos containing materials to non- asbestos waste.

Submittals

Before Start of Work: Submit the following to the Owner's Representative for review.

Name of waste hauler.

Name and address of landfill where asbestos-containing waste materials are to be buried. Include contact person and telephone number.

Chain of Custody and waste shipment forms proposed.

Submit copies of all waste shipment records to Owner's Representative prior to transporting waste material off project site.

Products

Bags:

Provide clear (see-through) 6 mil thick leak-tight polyethylene bags labeled with two labels with text as follows:

First Label: In accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING AIRBORNE ASBESTOS, TREMOLITE, ANTHOPHYLLITE, OR ACTINOLITE FIBERS IS HAZARDOUS TO YOUR HEALTH

Second Label: Provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances: Final Rule. Published November 21, 1986 and revised February 17, 1987:

RQ (ASBESTOS)
Class 9
NA 2212
P.G. III

Comply with the following sections during all phases of this work:

Section 02 82 21 Respiratory Protection

General

Discharge no visible emissions to the outside air during the collection, processing, packaging, or transporting of any asbestos-containing waste material.

For asbestos-containing waste material to be transported off the facility site, label containers or wrapped materials with the name of the waste generator and the location at which the waste was generated.

Vehicles used to transport asbestos containing wastes must display a sign during loading and unloading operations. The sign should read:

DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
Authorized Personnel Only

The letters should be at least one inch in the capitalized lines and 14 point Gothic in the last line.

For all asbestos containing waste material transported off the facility site, maintain waste shipment records with the following information:

The name, address, and telephone number of the waste generator.

The name and address of the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program.

The approximate quantity in cubic yards.

The name and telephone number of the disposal site operator.

The name and physical site location of the disposal site.

The date transported.

The name, address, and telephone number of the transporter(s).

A certification that the contents of the consignment is fully and accurately described by proper shipping name and is classified, packed, marked, and labeled, and is in all respects in proper condition for transport by highway according to applicable international and government regulations.

Provide a copy of the waste shipment record to the disposal site owners or operators at the same time as the asbestos containing waste material is delivered to the disposal site.

For waste shipments where a copy of the waste shipment record, signed by the owner or operator of the designated disposal site, is not received by the waste generator within 35 days of the date the waste was accepted by the initial transporter, the transporter and/or the owner or operator of the designated disposal site will be contacted by the waste generator to determine the status of the waste shipment.

If a copy of the waste shipment record, signed by the owner or operator of the designated waste disposal site is not received by the waste generator within 45 days of the date that it was accepted by the initial transporter, a report written by the waste generator will be sent to the local, State, or EPA Regional office responsible for administering the asbestos NESHAP program. The report will contain the following information:

A copy of the waste shipment record for which a confirmation of delivery was not received.

A cover letter signed by the waste generator explaining the efforts taken to locate the asbestos waste shipment and the results of those efforts.

Retain a copy of all waste shipment records, including a copy of the waste shipment record signed by the owner or operator of the designated waste disposal site, for at least two years.

The Contractor shall provide a copy of all waste manifests showing quantities of waste material transported off the project site.

Furnish upon request, and make available for inspection by the Administrator, all waste shipment records.

All waste is to be hauled by a waste hauler with all required licenses form all state and local authority with jurisdiction.

Load all asbestos-containing waste material in clear (see-through) disposal bags. All materials are to be contained in clear (see-through) two 6-mil disposal bags. Double bagging of material is to be performed inside the decontamination Unit.

Protect interior of truck or dumpster with Critical and Primary Barriers as described in Section 02 82 16.4 Temporary Enclosures.

Carefully load waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.

Do not store materials outside of the Work Area. Take waste material from the Work Area directly to a sealed truck or dumpster. Do not transport clear (see-through) disposal bagged materials on open trucks.
Advise the landfill operator or processor, in advance of transport, of the quantity of material to be delivered.

At disposal site unload waste:

At a disposal site, sealed bags will be carefully unloaded from the truck. If bags are torn or severely damaged, return to work site for rebagging. Clean entire truck and contents using procedures set forth in section 02 82 16.8 Project Decontamination.

Exhibit 6 9/14/17

Assumptions and Clarifications:

1. The existing utilities and services are assumed to be adequate for the renovation work.
2. The owner will pay for the cost of onsite utility consumption used for construction. (I.E. power, gas, and water).
3. The Library shall remove all existing furniture and loose items currently in the space to allow for construction to take place. Should AM Higley be required to remove or throw away any left over furniture and/or loose items, additional cost for that work will be required.
4. This GMP is inclusive of only the abatement portion of the work and the payment to AT&T for the removal of, and new service for, internet and phone lines. Any addition work will be included in a future amendment.
5. The owner will be responsible for the payment of the plan review fees, building permit, and the certificate of occupancy fees, if required.
6. This estimate does not provide for the following, if required, unless specifically noted herein:
    a. Financing costs
    b. Relocation of existing facilities, including furniture and equipment
    c. Professional fees and expenses
    d. Utility capacity, connection, or consumption charges
    e. Owner's contingency
    f. Separate commissioning by an independent commissioning agent
    g. Builder's Risk Insurance
    h. Loose furniture, furnishings, and equipment
    i. Maintenance equipment
    j. Preventative maintenance contracts
    k. Overtime allowance