

University of South Carolina
Columbia, South Carolina

**Project Manual for 1600 Hampton Penthouse
ACM**

Project Number: CP00365642

September 19, 2013

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SE-311

Invitation for Minor Construction Quotes

SCBO NOTES 2, 4 and 5 APPLY TO THIS INVITATION FOR QUOTESPROJECT NAME: 1600 Hampton Penthouse ACMPROJECT NUMBER: CP00365642 PROJECT LOCATION: Columbia SCBID SECURITY REQUIRED? Yes No PERFORMANCE BOND REQUIRED? Yes No PAYMENT BOND REQUIRED? Yes No CONSTRUCTION COST RANGE: <\$50K

DESCRIPTION OF PROJECT:

Abate the asbestos transite panels from the roof of 1600 Hampton St.'s elevator penthouse, and patch any holes remaining in the block exterior. Small and minority business participation encouraged. It is the contractor's responsibility to obtain all bidding documents from the purchasing website.

A/E NAME: Environmental Consulting Services A/E CONTACT: Don CobbADDRESS: 736-D Ste Andrews Rd. PHONE: 803-772-1070 Fax: _____CITY: Columbia STATE: sc ZIP: 29210 E-MAIL: ecsinc@sc.ir.com

PLANS ON FILE AT: AGC: _____

DODGE: _____

OTHER: _____

PLANS MAY BE OBTAINED FROM: http://purchasing.sc.edu (See Facilities Construction & Solicitations & Awards)PLAN DEPOSIT AMOUNT: _____ IS DEPOSIT REFUNDABLE? Yes No PRE-QUOTE CONFERENCE? Yes No MANDATORY ATTENDANCE? Yes NoDATE: 10/8/2013 TIME: 10 am PLACE: 743 Greene St, Conf Rm 53, Columbia, SCAGENCY: University of South CarolinaNAME AND TITLE OF AGENCY COORDINATOR: Juaquana Brookins, Procurement Specialist IIADDRESS: 743 Greene Street PHONE: 803.777.3596 Fax: 803.777.7334CITY: Columbia STATE: sc ZIP: 29208 E-MAIL: jbrookin@fmc.sc.eduIFQ CLOSING DATE: 10/16/2013 TIME: 2pm LOCATION: 743 Greene St, Conf Rm 53, Cola, SC

IFQ DELIVERY ADDRESSES:

HAND-DELIVERY:

see mail

MAIL SERVICE:

743 Greene Street
Columbia, SC 29208
Attn: Juaquana Brookins

IS PROJECT WITHIN AGENCY CONSTRUCTION CERTIFICATION? (Agency MUST check one) YES NO

APPROVED BY: _____

(State Engineer)

(Date)

SE-331
Quote Form

2011 Edition

Quotes shall be submitted only on SE-331

QUOTE SUBMITTED BY: _____
(Offeror's Name)

QUOTE SUBMITTED TO: University of South Carolina
(Agency Name)

FOR PROJECT: CP00365642 1600 Hampton Penthouse ACM
(Number) (Name)

OFFER

1. In response to the Form SE-311, *Request for Minor Construction Quotes*, and in compliance with the *Instructions to Bidders* for the above-named Project, the undersigned OFFEROR proposes and agrees, if this Quote is accepted, to enter into a Contract with the AGENCY in the form included in the Solicitation Documents, and to perform all Work as specified or indicated in the Solicitation Documents, for the prices and within the time frames indicated in the Solicitation and in accordance with the other terms and conditions stated.

2. Pursuant to Section 11-32-3030(1) of the SC Code of Laws, as amended, OFFEROR has submitted Bid Security as follows in the amount and form required by the Solicitation Documents:

Bid Bond with Power of Attorney Electronic Bid Bond Cashier's Check
(OFFEROR check one, if Bid Security is required)

3. OFFEROR acknowledges the receipt of the following Addenda to the Solicitation documents and has incorporated the effects of said Addenda into its Quote:

ADDENDUM No: _____

4. OFFEROR agrees that this Quote, including all bid alternates, if any, may not be revoked or withdrawn after the opening of bids, and shall remain open for acceptance for a period of 60 Days following the Quote Date, or for such longer period of time that OFFEROR may agree to in writing upon request of the AGENCY.

5. OFFEROR agrees that from the compensation to be paid, the AGENCY shall retain as Liquidated Damages the amount of for each calendar day the actual construction time required to achieve Substantial Completion exceeds the specified or adjusted Contract Time for Substantial Completion, as provided in the Contract Documents.

6. OFFEROR herewith submits its offer to provide all labor, materials, equipment, tools of trades and labor, accessories, appliances, warranties and guarantees, and to pay all royalties, fee, permits, licenses and applicable taxes necessary to complete the following items of construction work:

6.1 BASE BID _____
(enter BASE BID in figures only)

6.2 ALTERNATE NO. 1 _____ to be ADDED/DEDUCTED from BASE BID.
(circle one)

6.3 ALTERNATE NO. 2 _____ to be ADDED/DEDUCTED from BASE BID.
(circle one)

FEIN/SSN: _____

SC Contractor's License Number: _____

Address: _____

Telephone/Fax _____

E-mail _____

This Quote is hereby submitted on behalf of the Offeror named above.

BY: _____
(Signature of Offeror's Representative)

(Print or Type Name of Offeror's Representative)

ITS: _____

USC SUPPLEMENTAL GENERAL CONDITIONS
FOR CONSTRUCTION PROJECTS

1. Contractor's employees shall take all reasonable means not to interrupt the flow of student traffic in building corridors, lobbies and stairs. All necessary and reasonable safety precautions shall be taken to prevent injury to building occupants while transporting materials and equipment through the building to the work area. Providing safe, accessible, plywood pedestrian ways around construction may be required if a suitable alternative route is not available.
2. Fraternalization between Contractor's employees and USC students, faculty or staff is strictly prohibited-zero tolerance!
3. USC will not tolerate rude, abusive or degrading behavior on the job site. Heckling and cat-calling directed toward students, faculty or staff or any other person on USC property is strictly prohibited. Any contractor whose employees violate this requirement will be assessed a fine of up to \$500 per violation.
4. Contractor's employees must adhere to the University's policy of maintaining a drug-free and smoke-free/tobacco free workplace.
5. Contractor must sign a Contractor Key Receipt/Return form before any keys are issued. Keys must be returned immediately upon the completion of the work. The Contractor will bear the cost of any re-keying necessary due to the loss of or failure to return keys.
6. A welding permit must be issued by the University Fire Marshall before any welding can begin inside a building. Project Manager will coordinate.
7. Contractor must notify the University immediately upon the discovery of suspect material such as those potentially containing asbestos or other such hazardous materials. These materials **must not** be disturbed until approved by the USC Project Manager.
8. At the beginning of the project, the USC Project Manager will establish the Contractor's lay-down area. This area will also be used for the Contractor's work vehicles. No personal vehicles will be allowed in this area, or in any areas surrounding the construction site that are not regular or authorized parking lots. Personal vehicles must be parked in the perimeter parking lots. Parking permits can be obtained at the USC Parking Office located in the Pendleton Street parking garage. The lay down area will be clearly identified to the contractor by the PM, with a sketch or drawing provided to Parking. In turn, the contractor will mark off this area with a sign containing the project name, PM name, Contractor name and contact number, and end date. Where this area is subject to foot traffic, protective barriers will be provided as specified by the PM. The area will be maintained in a neat and orderly fashion. Vehicles parked in the lay down area (or designated parking areas) will be clearly marked or display a CPC furnished placard for identification.

9. Contractor will be responsible for providing its own temporary toilet facilities, unless prior arrangements are made with the USC Project Manager.
10. Use of USC communications facilities (telephones, computers, etc.) by the Contractor is prohibited, unless prior arrangements are made with the USC Project Manager.
11. For all projects over \$100,000, including IDC's, an SE-395, Contractor Performance Evaluation, will be completed by the USC Project Manager and reviewed with the GC at the beginning of the project and a copy given to the GC. At the end of the project the form will be completed and a Construction Performance rating will be established.
12. Contractor is responsible for removal of all debris from the site, and is required to provide the necessary dumpsters which will be emptied at least one times per week. Construction waste must not be placed in University dumpsters. THE CONSTRUCTION SITE MUST BE THOROUGHLY CLEANED WITH ALL TRASH PICKED UP AND PROPERLY DISPOSED OF ON A DAILY BASIS AND THE SITE MUST BE LEFT IN A SAFE AND SANITARY CONDITION EACH DAY. THE UNIVERSITY WILL INSPECT JOB SITES REGULARLY AND WILL FINE ANY CONTRACTOR FOUND TO BE IN VIOLATION OF THIS REQUIREMENT AN AMOUNT OF UP TO \$1,000 PER VIOLATION.
13. **Contractor must provide all O&M manuals, as-built drawings, and training of USC personnel on new equipment, controls, etc. prior to Substantial Completion. Final payment will not be made until this is completed.**
14. The contractor will comply with all regulations set forth by OSHA and SCDHEC. Contractor must also adhere to USC's internal policies and procedures (available by request). As requested, the contractor will submit all Safety Programs and Certificates of Insurance to the University for review.
15. Tree protection fencing is required to protect existing trees and other landscape features to be preserved within a construction area. The limits of this fence will be evaluated for each situation with the consultant, USC Arborist and USC Project Manager. The tree protection fence shall be 5' high chain link fence unless otherwise approved by USC Project Manager. No entry or materials storage will be allowed inside the tree protection zone. A 4" layer of mulch shall be placed over the tree protection area to maintain moisture in the root zone.
16. Where it is necessary to cross walks, tree root zones (i.e., under canopy) or lawns the following measures shall be taken: For single loads up to 9,000 lbs., a 3/4" minimum plywood base shall be placed over areas impacted. For single loads over 9,000 lbs., two layers of 3/4" plywood is required.
17. For projects requiring heavy loads to cross walks tree root zones or lawns. A construction entry road consisting of 10' X 16' oak logging mates on 12" coarse, chipped, hardwood base. Mulch and logging mats shall be supplemented throughout the project to keep

Updated: July 15, 2011

matting structurally functional.

18. Any damage to existing landscaping (including lawn areas) will be remediated before final payment is made.
19. Orange safety fence to be provided by the contractor. (USC Arborist, Kevin Curtis may be contacted at 777-0033 or 315-0319)

Campus Vehicle Expectations

1. All motorized vehicles on the University campus are expected to travel and park on roadways and/or in parking stalls.
2. All motorized vehicle traffic on USC walkways must first receive the Landscape Manager's authorization. Violators may be subject to fines and penalties.
3. All motorized vehicles that leak or drip liquids are prohibited from traveling or parking on walks or landscaped areas.
4. Contractors, vendors, and delivery personnel are required to obtain prior parking authorization before parking in a designated space. Violators may be subject to fines and/or penalties. See Item 10 below.
5. Drivers of equipment or motor vehicles that damage university hardscape or landscape will be held personally responsible for damages and restoration expense.
6. Vehicle drivers who park on landscape or drives must be able to produce written evidence of need or emergency requiring parking on same.
7. All vehicles parked on landscape, hardscape, or in the process of service delivery, must display adequate safety devices, i.e. flashing lights, cones, signage, etc.
8. All drivers of equipment and vehicles will be respectful of University landscape, equipment, structures, fixtures and signage.
9. All incidents of property damage will be reported to Parking Services or the Work Management Center.
10. Parking on campus is restricted to spaces designated by Parking Services at the beginning of the project. Once the project manager and contractor agree on how many spaces are needed, the project manager will obtain a placard for each vehicle. This placard must be hung from the mirror of the vehicle, otherwise a ticket will be issued and these tickets cannot be "fixed". Parking spaces are restricted to work vehicles only; no personal vehicles.

Project Name: 1600 Hampton Penthouse ACM

Project Number: CP00365642

University of South Carolina

CONTRACTOR'S ONE YEAR GUARANTEE

STATE OF _____.

COUNTY OF _____

WE _____
as General Contractor on the above-named project, do hereby guarantee that all work executed under the requirements of the Contract Documents shall be free from defects due to faulty materials and /or workmanship for a period of one (1) year from date of acceptance of the work by the Owner and/or Architect/Engineer; and hereby agree to remedy defects due to faulty materials and/or workmanship, and pay for any damage resulting wherefrom, at no cost to the Owner, provided; however, that the following are excluded from this guarantee;

Defects or failures resulting from abuse by Owner.

Damage caused by fire, tornado, hail, hurricane, acts of God, wars, riots, or civil commotion.

[Name of Contracting Firm]

*By _____

Title _____

*Must be executed by an office of the Contracting Firm.

SWORN TO before me this
_____ day of _____, 2____ (seal)

_____ State

My commission expires _____

SECTION 01080 - DEFINITIONS AND STANDARDS

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

General Explanation: A substantial amount of specification language constitutes definitions for terms found in other contract documents, including the drawings. (Drawings must be recognized as diagrammatic in nature and not completely descriptive of the requirements indicated thereon.) Certain terms used in Contract Documents are defined in this article.

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

DEFINITIONS:

General: Definitions contained in this Article are not necessarily complete, but are general to the extent that they are not defined more explicitly elsewhere in the Contract Plans and Specifications.

Indicated: This term refers to graphic representations, notes or schedules on the Drawings, or other Paragraphs or Schedules in Specifications, and similar requirements in Contract Plans and Specifications. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.

Directed: Terms such as "directed", "requested", "authorized", "selected", "approved", "required", and "permitted" mean "directed by the Owner", "requested by the "Consultant", and similar phrases. However, no implied meaning shall be interpreted to extend the Owner's responsibility into the Contractor's area of construction supervision.

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

Furnish: The term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."

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

Provide: The term "provide" means "to furnish and install, complete and ready for the intended use."

Installer: An "Installer" is an entity engaged by the Contractor, either as an employee, subcontractor or sub-subcontractor for performance of a particular construction activity, including installation, erection, application and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

The term "experienced," when used with the term "Installer" means having a minimum of 5 previous Projects similar in size and scope to this project, and familiar with the precautions required, and has complied with requirements of the authority having jurisdiction.

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

Air Monitoring Firm or Air Monitor: An "Air Monitoring Firm" or "Air Monitor" is an independent entity engaged to perform specific tests, either at the project site or elsewhere, and to report on, and, if required, to interpret, results of those tests.

General Superintendent: This is the Contractor's Representative at the work site. This person will generally be the Competent Person required by OSHA in 29 CFR 1926.

DEFINITIONS RELATIVE TO ASBESTOS 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 Monitoring: The process of measuring the fiber content of a specific volume of air.

Air Monitor: Person(s) employed by Owner to conduct environmental and Clearance air monitoring.

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% of asbestos of any type or mixture of types as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy.

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 (ACWM): 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 Consultant, Air Monitor, 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.

Competent Person: As per OSHA 29 CFR 1926, meaning - a person who is capable of identifying existing asbestos, tremolite, anthophyllite, or actinolite hazards in the workplace and who has the authority to take prompt corrective measures to eliminate them.

Consultant: Person(s) employed by the Owner to insure completion of projects according to Plans and Specifications.

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 six (6) mil thick leak-tight plastic bag used for transporting asbestos waste from work and to disposal site. Each is labeled as follows:

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

AND

**RQ HAZARDOUS
SUBSTANCE
SOLID, NOS
ORM-E, NA 9188
(ASBESTOS)**

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

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.

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 as determined using the method specified in Appendix A, Subpart F, 40 CFR Part 763, Section 1, Polarized Light Microscopy, and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

HEPA Filter: A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of asbestos fibers greater than 0.3 microns in diameter.

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 microns 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.

Powered Air Purifying Respirator: A respirator in which air outside the respirator must pass through HEPA filters prior to entering the respirator mask. This is accomplished through a motor/fan unit located between the filters and the mask.

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.

Pressure Differential: Air pressure lower inside the Work Area than surrounding areas, generally caused by exhausting air from a sealed space (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 ACM 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.

Surgical Removal: Accomplished using HEPA equipped vacuum cleaners to gather wetted asbestos containing materials as the material is carefully scraped from small areas; usually used to facilitate the interface of barriers, etc. This work is accomplished by workers using respiratory protection and protective clothing working over drop cloths. Workers must use decontamination procedures that include showering properly. Drop cloths and protective clothing are considered as contaminated and are to be properly disposed of.

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

Type "C" Respirator: This refers to a pressure demand air line respirator with HEPA egress filter attachment connected to a source of compressed air equipped with a reserve air supply.

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.

SPECIFICATION CONTENT EXPLANATION

Assignment of Specialists: The Specification requires that certain specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and the assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

This requirement should not be interpreted to conflict with enforcement of building codes or regulations governing the work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

Trades: Use of titles such as "carpentry" is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.

DRAWING SYMBOLS

Graphic symbols used on the Drawings are those recognized in the construction industry for purposes indicated. Where not otherwise noted, symbols are defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., seventh edition.

Mechanical/Electrical Drawings: Graphic symbols used on mechanical and electrical Drawings are generally aligned with symbols recommended by ASHRAE. Where appropriate, they are supplemented by more specific symbols recommended by technical associations including ASME, ASPE, IEEE and similar organizations. Refer instances of uncertainty to the Owner for clarification before proceeding.

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 Plans and Specifications. Such standards are made a part of the Contract Plans and Specifications by reference. Individual Sections indicate which codes and standards the Contractor must keep available at the Project Site for reference.

Referenced industry standards take precedence over standards that are not referenced but recognized in the construction industry as applicable.

Unreferenced industry standards are not directly applicable to the work, except as a general requirement of whether the work complies with recognized construction industry standards.

Publication Dates: Where compliance with an industry standard is required, comply with standard in effect as of date of Contract Plans and Specifications.

Updated Standards: At the request of the Owner, Contractor or authority having jurisdiction, submit a Change Order proposal where applicable code or standard has been revised and reissued after the date of the Contract Plans and Specifications and before performance of Work affected. The Owner will decide whether to issue a Change Order to proceed with the updated standard.

Conflicting Requirements: Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Plans and Specifications indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Consultant for a decision before proceeding.

Minimum Quantities or Quality Levels: In every instance the quantity or quality level shown or specified shall be the minimum to be provided or performed. The actual installation may comply exactly, within specified tolerances, with the minimum quantity or quality specified, or it may exceed that minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for the context of the requirements. Refer instances of uncertainty to the Owner for decision before proceeding.

Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to that entities' construction activity. Copies of applicable standards are not bound with the Contract Plans and Specifications.

Where copies of standards are needed for performance of a required construction activity, the Contractor shall obtain copies directly from the publication source.

Although copies of standards needed for enforcement of requirements may be part of required submittals, the Owner reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where acronyms or abbreviations are used in the Specifications or other Contract Plans and Specifications they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations as referenced in Contract Plans and Specifications are defined to mean the associated names. Names and addresses are subject to change, and are believed to be, but are not assured to be, accurate and up-to-date as of date of Contract Plans and Specifications:

AIHA American Industrial Hygiene Association
2700 Prosperity Avenue
Suite 250
Fairfax, Virginia 22031
703/849-8888

AIA American Institute of Architects
1735 New York Ave. NW
Washington, DC 20006
202/626-7474

- ANSI American National Standards Institute
1430 Broadway
New York, NY 10018
212/354-3300
- ASHRAE American Society for Heating, Refrigerating, and Air Conditioning
Engineers
1791 Tullie Circle NE
Atlanta, GA 30329
404/636-8400
- ASME American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017
212/705-7722
- ASPE American Society of Plumbing Engineers
3716 Thousand Oaks Boulevard, Suite 210
Westlake, CA 91362
805/495-7120
- ASTM American Society for Testing and Materials
1916 Race St.
Philadelphia, PA 19103
215/299-5400
- AWCI Association of the Wall and Ceiling Industries-International
25 K Street, NW
Washington, DC 20002
202/783-2924
- CFR Code of Federal Regulations
Available from Government Printing Office
Washington, DC
20402 (usually first published in Federal Register)
202/783-3238

CGA	Compressed Gas Association 1235 Jefferson Davis Highway Arlington, VA 22202 703/979-0900
CS	Commercial Standard of NBS (U.S. Dept. of Commerce) Government Printing Office Washington, DC 20402 202/377-2000
DOT	Department of Transportation 400 Seventh St., SW Washington, DC 20590 202/426-4000
EPA	Environmental Protection Agency 401 M St.,SW Washington, DC 20460 202/382-3949
FMERC	Factory Mutual Engineering Research Corp. 1151 Boston Providence Highway Norwood, MA 02062 617/762-4300
FS	Federal Specification General Services Administration Obtain from your Regional GSA Office, or purchase from GSA Specifications Unit (WFSIS) 7th and D Streets,SW Washington, DC 20406 (202) 472-2205 or 2140
GA	Gypsum Association 1603 Orrington Avenue Evanston, IL 60201 (312) 491-1744

IEEE Institute of Electrical and Electronic Engineers
345 E. 47th Street
New York, NY 10017
212/705-7900

GSA General Services Administration
F Street and 18th Street, NW
Washington, DC 20405
(202) 655-4000

MIL Military Standardization Documents
(US Dept. of Defense)
Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

NIST National Institute for Standards in Technology
(U.S. Dept. of Commerce)
Gaithersburg, MD 20234
301/977-6711

NEC National Electrical Code (by NFPA)

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

OSHA Occupational Safety & Health Administration
(U.S. Dept. of Labor)
Government Printing Office
Washington, DC 20402
202/783-3238

PS Product Standard of NBS
(U.S. Dept. of Commerce)
Government Printing Office
Washington, DC 20402
202/783-3238

UL Underwriters Laboratories
 333 Pfingsten Rd.
 Northbrook, IL 60062
 312/272-8800

SUBMITTALS:

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION - 01080

SECTION 01085 - CODES AND REGULATIONS

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

DESCRIPTION OF THE WORK:

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

CODES AND REGULATIONS

General Applicability of Codes and Regulations, and Standards: 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 (and are made a part of the contract plans and specifications by reference) as if copied directly into the contract plans and specifications, or as if published copies are bound herewith.

Royalties and Patents: The Contractor is responsible for complying with all patents pertaining to processes he intends to use. The Contractor shall indemnify the Owner and the Consultant for any and all damages arising out of his failure to comply.

Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Owner and Owner's Consultant harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.

Federal Requirements: which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

OSHA: U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules
Title 29, Part 1910, Section 1001 and Part 1926, Section 1101 (Revised) of the Code of Federal Regulations

Excursion Limit for Short Duration Exposure to Asbestos
53FR 35610 of the Code of Federal Regulations

Respiratory Protection
Title 29, Part 1910, Section 134 of the Code of Federal Regulations

The Control of Hazardous Energy
Title 29, Part 1910, Section 147 of the Code of Federal Regulations

Construction Industry
Title 29, Part 1926, Section 1101 (Revised October, 1994) of the Code of Federal Regulations

Access to Employee Exposure and Medical Records
Title 29, Part 1910, Section 20 of the Code of Federal Regulations

Hazard Communication - General Industry
Title 29, Part 1910, Section 1200 of the Code of Federal Regulations

Hazard Communication - Construction Industry
Title 29, Part 1926, Sections 59
Code of Federal Regulations

Specifications for Accident Prevention Signs and Tags
Title 29, Part 1910, Section 145 of the Code of Federal Regulations

Floor, Wall Openings and Stairways - MSS Systems - Construction Industry
29 CFR, Part 1926, Sections 451-452, Subpart L of the Code of Federal Regulations

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29 CFR, Part 1926, Section 500, Subpart M of the
Code of Federal Regulations
29 CFR, Part 1926, Sections 850-859, Subpart T, of the Code of Federal Regulations

Walking/Working Surfaces - General Industry
29 CFR, Part 1910, Sections 21-32, Subpart D of the
Code of Federal Regulations
29 CFR, Part 1910, Sections 66-70, Subpart F of the Code of Federal Regulations

DOT: U. S. Department of Transportation, including but not limited to:

Hazardous Substances
Title 29, Part 171 and 172 of the
Code of Federal Regulations

Hazardous Substances
Title 49, Parts 106,107 and 171-180
Code of Federal Regulations
(as revised December 20, 1991)

EPA: U. S. Environmental Protection Agency (EPA), including but not limited to:

Toxic Substances Control Act (TSCA)
Title 40, Part 761
Code of Federal Regulations

Asbestos Abatement Projects; Worker Protection Rule
Title 40 Part 763, Sub-part G of the
Code of Federal Regulations

National Emission Standard for Hazardous Air Pollutants (NESHAPS)
National Emission Standard for Asbestos
Title 40, Part 61, Sub-part A,
and Sub-part M (Revised Sub-part B) of the
Code of Federal Regulations (as revised November 20, 1990)

State Requirements: which govern asbestos abatement work or hauling and disposal of asbestos
waste materials include but are not limited to the most recent Amendments to:

State requirements: South Carolina Statute 61-86.1
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201

Local requirements - all work under this Contract to be performed under any applicable local work codes.

STANDARDS:

Standards: which apply to asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

American National Standards Institute (ANSI)
1430 Broadway
New York, New York 10018 (212)354-3300

Fundamentals Governing the Design and Operation of Local Exhaust Systems
Publication Z9.2-79

Practices for Respiratory Protection Publication Z88.2-80

American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, PA 19103
(215)299-5400

Safety and Health Requirements Relating to Occupational Exposure to Asbestos
E 849-82

Specification for Encapsulants for Friable Asbestos Containing Building Materials
Proposal P-189

EPA GUIDANCE DOCUMENTS:

EPA Guidance Documents: discuss asbestos abatement work or hauling and disposal of asbestos waste materials listed below for the Contractor's information only. These documents do not describe the work and are not a part of the work of this contract. EPA maintains an information number (800) 334-8571, publications can be ordered from (800) 424-9065 (554-1404 in Washington, DC):

Guidance for Controlling Asbestos Containing Materials in Buildings (Purple Book) EPA
560/5-85-024

Asbestos in Buildings: National Survey of Asbestos Containing Friable Materials. EPA
560/5-84-006.

Asbestos in Buildings: Guidance for Service and Maintenance Personnel. EPA 560/5-85-018.

Asbestos Waste Management Guidance. EPA 530-SW-85-007.

Asbestos/NESHAPS Adequately Wet Guidance. EPA 340-1-90-019

Asbestos Fact Book. EPA Office of Public Affairs.

Asbestos in Buildings. Simplified Sampling Scheme for Friable Surfacing Materials.

Commercial Laboratories with Polarized Light Microscopy Capabilities for bulk asbestos identification.

A Guide to Respiratory Protection for the Asbestos Abatement Industry. EPA-560-OPTS-86-001

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

NOTICES:

U.S. ENVIRONMENTAL PROTECTION AGENCY

The Contractor Shall: Send Written Notification as required by US EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61, Subpart M, as revised November 20, 1990) to the regional Asbestos NESHAPS Contact at least 10 working days

(Mon.-Fri.) prior to beginning any friable work on asbestos-containing materials. Send notification to the following address:

South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
Attn: Bureau of Air Quality

Notification: Include the following information in the notification sent to the NESHAPS contact:

Name and address of owner or operator.

Description of the facility being demolished or renovated, including the size, age, and prior use of the facility.

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Estimate of the approximate amount of friable asbestos material present in the facility in terms of linear feet of pipe, and surface area on other facility components. For facilities in which the amount of friable asbestos materials less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) on other facility components, explain techniques of estimation.

Location of the facility being demolished or renovated.

Scheduled starting and completion dates of demolition or renovation.

Nature of planned demolition or renovation and method(s) to be used.

Procedures to be used to comply with the requirements of US EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) Asbestos Regulations (40 CFR 61 Subpart M).

Name and location of the waste disposal site where the friable asbestos waste material will be deposited.

For facilities being demolished under an order of a State or local governmental agency, issued because the facility is structurally unsound and in danger of imminent collapse, the name, title, and authority of the State or local governmental representative who has ordered the demolition.

Other information as required by 40 CFR 61, Subpart M (as amended November 20, 1990).

Copies of notifications will be submitted to the Owner and the Consultant by the Contractor.

STATE AND LOCAL AGENCIES:

The Contractor Shall Send written notification (within 10 working days, Mon.- Fri.) as required by state and local regulations prior to beginning any friable work on asbestos-containing materials.

PERMITS:

Permit: All asbestos containing waste is to be transported by an entity maintaining a current "Industrial waste hauler permit" specifically for asbestos-containing materials, as required for transporting of waste asbestos-containing materials to a disposal site.

LICENSES:

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

POSTING AND FILING OF REGULATIONS

Posting and Filing of Regulations: Post all notices required by applicable federal, state and local regulations. Maintain two (2) copies of applicable federal, state and local regulations and standards. Maintain one copy of each at job site. Keep on file in Contractor's office one copy of each.

END OF SECTION - 01085

SECTION 01100 - PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

The Schedule of Submittals are included under Section "Submittals."

Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.

Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment."

DEFINITIONS

Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Plans and Specifications.

Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Plans and Specifications proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:

Substitutions requested by Bidders during the bidding period and accepted prior to award of Contract are considered as included in the Contract Plans and Specifications and are not subject to requirements specified in this Section for substitutions.

Revisions to Contract Plans and Specifications requested by the Owner or Owner's Consultant.

Specified options of products and construction methods included in Contract Plans and Specifications.

The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

PART 2 - PRODUCTS

SUBSTITUTIONS

Conditions: The Contractor's substitution request will be received and considered by the Consultant when one or more of the following conditions are satisfied, as determined by the Consultant; otherwise requests will be returned without action except to record noncompliance with these requirements.

Extensive revisions to Contract Plans and Specifications are not required.

Proposed changes are in keeping with the general intent of Contract Plans and Specifications.

The request is timely, fully documented, and properly submitted.

The request is directly related to an "or equal" clause or similar language in the Contract Plans and Specifications.

The specified equipment, product or method of construction cannot be provided within the Contract Time. The request will not be considered if the equipment, product or method cannot be provided as a result of failure to pursue the work promptly or coordinate activities properly.

The specified equipment, product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

A substantial advantage is offered the Owner, in terms of safety, cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Consultant for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.

The specified equipment, product or method of construction cannot be provided in a manner that is compatible with other materials, and the Contractor certifies that the substitution will overcome the incompatibility.

The specified equipment, product or method of construction cannot be coordinated with other materials, and the Contractor certifies that the proposed substitution can be coordinated.

The specified equipment, product or method of construction cannot provide a warranty required by the Contract Plans and Specifications.

The Contractor certifies that the proposed substitution provides the required warranty.

The Contractor's submittal and Consultant's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Plans and Specifications does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01100

SECTION 01200 - PROJECT COORDINATION AND REPORTS

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

SUMMARY

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

Administrative and supervisory personnel.

Progress Meetings

Pre-Construction Conference

Daily Log

Special reports.

Contingency Plans

Notifications to other entities at job site.

Requirements for the Contractor's Construction Schedule are included in Section 01300 "Submittals" and Section 01310 "Construction Schedule".

ADMINISTRATIVE AND SUPERVISORY PERSONNEL: for State of South Carolina Licensed Removal Contractor.

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

Experience and Training: The On-Site Supervisor must have completed a course at an EPA Training Center or equivalent certificate course in supervision of asbestos abatement procedures, and have had a minimum of two (2) years on-the-job experience in asbestos abatement project supervision.

Competent Person: The On-Site Supervisor is to be a Competent Person as required by OSHA in 29 CFR 1926.

Accreditation: The On-Site Supervisor is to be accredited as an Asbestos Abatement Supervisor in accordance with South Carolina statute 61-86.1. Submit most recent certificate for One (1) Day Refresher Training Course.

PROGRESS MEETINGS:

General: In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, Owner and Consultant will hold general progress meetings weekly. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting.

PRE-CONSTRUCTION CONFERENCE:

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

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

DAILY WORK AREA ENTRY LOG:

Daily Work Area Entry Log: Maintain within the Decontamination Unit a daily Work Area entry log documenting the dates and time of but not limited to, the following items:

Visitations; authorized and unauthorized.

Personnel, by name and social security number, entering and leaving the work area.

Provide PAPR flow rates (CFM)

DAILY CONSTRUCTION REPORT:

Maintain at the job site and submit three (3) copies at the end of each shift, a daily construction report documenting the following items:

Meetings; purpose, attendees, brief discussion.

Special or unusual events, i.e. barrier breeching, equipment failures, accidents.

Air monitoring tests and test results (to be provided prior to the start of the next shift)

Documentation of Contractor's completion of the following:

Inspection of work area preparation prior to start of removal and daily thereafter.

Removal of any sheet plastic barriers.

Contractor's inspections prior to spray back, lock down, or any other operation that will conceal the condition of asbestos-containing materials or the substrate from which such materials have been removed.

Removal of waste materials from work area.

Decontamination of equipment (list items).

Contractors final inspection/final air test analysis.

Pressure differential readings.

Presence of visitors, inspectors, etc. on the site.

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

SPECIAL REPORTS:

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

Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures), prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at earliest possible date.

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Non-Applicable)

END OF SECTION - 01200

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract for Construction, special contract conditions and other Specification Sections, apply to the work of this Section.

DESCRIPTION OF THE WORK:

The Work of this Section pertains to the detailed information that the Contractor must submit to the Building Owner for approval relative to the materials, equipment, personnel, etc. to be utilized to accomplish the work of this project.

QUALITY ASSURANCE:

Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

The Building Owner reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

CERTIFICATE OF COMPLIANCE:

Certify that all materials used in the work comply with all specified provisions thereof. Certification shall not be construed as relieving the Contractor from furnishing satisfactory materials if, after tests are performed on selected samples, the material is found not to meet specified requirements.

PART 2 - PRODUCTS (Not Applicable.)

PART 3 - EXECUTION

CONTRACTOR'S CONSTRUCTION SCHEDULE: Submit the following to the Building Owner:

Schedule: Provide proposed detailed schedule including work dates, work shift time, number of employees, dates of start and completion including dates of preparation work, removals and final inspection dates.

Secure time commitments for performing critical elements of the work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the work.

On-Site Supervisor: Submit the experience and training of the proposed on-site supervisor for the project, qualifying him as the Competent Person as required by OSHA in 29 CFR 1926.1101. This person shall have completed not less than a five day course at an EPA accredited training center, as required by Statute 61-86.1 of the South Carolina Procedures for Asbestos Removal, and have had a minimum of two (2) years on-the-job training as a Project Supervisor. In addition, submit a training certificate from the most recent one (1) day refresher course.

Permits, Licenses, and Certificates: For the Owner's records, submit copies of Contractor's South Carolina Abatement Contractor's licenses, permits, certifications, etc. as required to provide compliance with Federal and/or State Standards and Regulations associated with conducting asbestos abatement activities.

Jurisdictional Settlements, Notices, Receipts for Fee Payments: Submit copies of any jurisdictional notices, citations, fee payments, correspondence, etc. issued to the Contractor as a result of any asbestos abatement activities they have been associated with.

Before Start of Work: Submit the following to the Building Owner for review.

South Carolina Statute 61-86.1 : Submit copies of certificates from an EPA-approved Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the S.C. Statute 61-86.1. Said training course shall not be less than four days. In addition, submit a training certificate from the most recent one (1) day refresher course attended by each worker. Worker shall have a minimum of one (1) year on-the-job training as an abatement worker.

State and Local License: Submit evidence that all workers have been trained, certified and accredited as required by the South Carolina Department of Health and Environmental Control.

Certificate Worker Acknowledgement: Submit an original signed copy of the Certificate of Employee (Worker) Release for each worker who is to be at the job site or enter the Work Area.

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 Social Security Number.

Physicians Written Opinion signed by the 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 and the synergistic effect of asbestos exposure and smoking.

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.

Notarized Certifications: Submit certification signed by an officer of the abatement contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

Employment Eligibility Verification (Form I-9): Submit an original signed copy of Form I-9 for each worker who is to be at the job site.

Contractor's Respiratory Protection Program: Submit qualified written respiratory protection program as required in ANSI Z88.2-1980 and OSHA 29 CFR 1926.1101.

Contractor's Safety Program: Submit a complete copy of the Contractor's Safety Program covering all aspects of construction work practices used for the completion of this project.

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. Note that nothing in this Specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.

Written Hazard Communication Program: Submit Contractor's written Hazard Communication Program. This program must state how the Contractor plans to meet the various requirements of the standard. This written program must be available at the job site, and must contain the following elements:

1. Container Labels: All containers shall be identified with manufacturer's labels for all chemicals used on-site with the identity of the chemicals appropriate hazard warnings, and the manufacturer's name and address. No chemicals will be allowed on-site without approved labeling.
2. Site-Specific List of Chemicals with Corresponding Material Safety Data Sheets. Additionally, include Material Safety Data Sheets for type(s) of asbestos being abated.
3. Training: Submit a written description of the training given to employees exposed to any chemicals.
4. Hazard Communication Program: THIS PROGRAM MUST BE WRITTEN IN ACCORDANCE WITH OSHA'S HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200 AND 29 CFR 1926.59.
5. The Contractor shall ensure that the Written Hazard Communication Program meets paragraph (e) of 29 CFR 1910.1200 and 1926.59, if applicable (i.e. - multi-employer workplaces).

A written description of the Contractor's Program to distribute the names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation.

Negative Pressure Respirator: Submit manufacturer's product information for each component used, including NIOSH certifications for entire assembly.

Powered Air Purifying Respirators: Submit manufacturer's product information for each component used, including NIOSH certifications for each component in an assembly and/or for entire assembly.

Type C Supplied Air Respiratory System: Submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in Work Area, routing of air lines to Work Area(s) from compressor. Submit manufacturer's product information, including NIOSH certifications, and complete operating and maintenance instructions for all components and systems as a whole. Submit resume and information on training for individual designated to monitor the operation of supplied air respiratory systems. Submit training certification.

Personal Air Sampling:

ONE SET OF SUBMITTALS SHOULD BE SENT TO THE BUILDING OWNER.

Additionally, before start of work submit the following to the Building Owner for review.

Submit the name and address of the Contractor's Testing Laboratory.

Submit Testing Laboratory's Written Hazard Communication's Program with MSDS's that will be kept on-site.

Submit a copy of the consulting license for the State of South Carolina Department of Health and Environmental Control.

Submit a copy of verification of completion of NIOSH Course No. 582 or equivalent for all personnel collecting and analyzing samples.

Submit verification of current completion of "Supervision of Asbestos Abatement Projects" Course and One (1) Day Supervision Refresher Course for each air sampling person.

Submit medical records and Respirator Training and Fit Test records for air samplers.
Submit proof of five year's air sampling experience (minimum).

PRODUCT DATA:

Collect Product Data into a single submittal. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

HEPA Vacuums: Submit manufacturer's product data and operation and maintenance manuals for all HEPA vacuums to be utilized on the project.

Pressure Differential System: Submit plan of pressure differential system, including the following:

1. Manufacturer's product data and operation and maintenance manuals for the air machines, including fan curve and pressure differential monitors to be used.
2. Proposed location of the machines and air discharge.
3. Proposed location of pressure differential monitors.

Temporary Power: Submit manufacturer's product data for all components to be utilized as a part of the temporary power distribution system. Submit a one line diagram together with a detailed sketch showing the location of components, routing of conduits, and temporary power and lighting distribution system. Submit copy of South Carolina License of Electrician to install temporary power.

Scaffolding: If scaffolding is to be utilized to construct work platforms or temporary enclosures around the equipment designated to remain, submit details relative to the type of scaffolding system to be utilized, location of support posts, height of scaffold work platform, type and location of access stairways, etc. Submit details relative to the type of work platform system to be utilized (scaffolding or metal framing), height of work platform, type and location of access stairways, etc. For any work platform constructed of conventional framing lumber, submit certified load limits by a registered Professional Engineer that the work platform is capable of supporting a live load of 100psf in addition to the platform's dead load.

Shower Stall: Submit manufacturer's product data.

Filter/Pump Assembly: Submit manufacturer's product data and operation and maintenance manual.

Surfactant: Submit manufacturer's product data, use instruction, and Material Safety Data Sheet (in accordance with OSHA Hazard Communication Standard 29 CFR 1926.59).

Encapsulant: Submit manufacturer's product data, use instruction, and Material Safety Data Sheet (in accordance with OSHA Hazard Communication Standard 29 CFR 1926.59).

Fire-Stop Sealant: Submit documentation that the fire-stop sealant(s) proposed is listed as an acceptable product to be left in place in the Fill, Void, or Cavity Materials (XHHW) Section(s) of the most recent U.L. Fire Resistance Directory. Submit manufacturer's product data, use instructions and U.L. listing.

DURING THE WORK ON THIS PROJECT:

Submit the Following:

Daily Work Area Entry Log: Maintain within the Decontamination Unit and submit to the Building Owner daily, a daily work area entry log documenting the dates and time of, but not limited to, the following items:

- A. Personnel, by name and social security number, entering and leaving the Work Area.
- B. Visitations: authorized and unauthorized into the Work Area.
- C. Flow rate for PAPR's (cfm).

Personal Air Monitoring Test Results: Certified copies of all personal air monitoring test results shall be submitted to the Consultant and posted in the clean room of the decontamination unit and the Contractor's office prior to start of work on the next shift. A final report including a summary of all personal air tests shall be submitted to the Consultant within two weeks following project completion. The on-site analyst shall submit to the Consultant results of QA/QC blind recounts conducted at the rate of 10 percent. Results shall be submitted within two weeks of being collected.

Reporting Unusual Events: When an event of unusual and significant nature occurs at site (examples: failure of pressure differential system, rupture of temporary enclosures), prepare and submit a special report listing chain of events, persons participating, response by Contractor's personnel, evaluation of results of effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at earliest possible date.

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

Disposal: Submit copies of all trip manifests and landfill receipts within twenty-four (24) hours after material has been disposed of.

PRIOR TO FINAL PAYMENT: Receive Certification from the Building Owner that all required submittals have been received, reviewed and approved.

BUILDING OWNER'S ACTION

Except for submittals for record, information or similar purposes, where action and return is required or requested, the Building Owner will review each submittal, mark to indicate action taken, and return promptly.

END OF SECTION 01300

SECTION 01310 - CONSTRUCTION SCHEDULE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to this Section.

SUMMARY

This Section specifies administrative and procedural requirements for construction scheduling for performance of the Work, including but not limited to:

Contractor shall submit a detailed abatement schedule for the performance of the Work.

Contractor shall submit number of man hours and days required for work force for the performance of the Work.

Contractor shall submit proposed number of shifts per 24 hour period and number of men per shift.

After awarding of Bid and prior to mobilization, the above three submittals must be provided to the Building Owner.

COORDINATION

Contractor shall update Construction schedule on a daily basis and will chart progress of the Work.

Contractor shall submit an updated schedule at each progress meeting during the Work.

If behind schedule, Contractor shall explain in writing the reason for delay and his proposals for remedying the situation.

Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.

Indicate Clearance of each Work Area in advance of the dates established for Clearance.

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Allow time for testing and other Consultant's procedures necessary for certification of Clearance.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01310

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SECTION 01405 - PERSONAL AIR MONITORING

PART I - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK:

This section describes work being performed by the Contractor. This work is included in the Contract Sum.

The Contractor is to supply an independent Testing Laboratory to perform personal air monitoring on Contractor personnel and on site analysis of all samples collected. The Contractor shall perform personal monitoring on 25 percent of his personnel per shift each day with monitoring rotation ensuring that all employees are monitored each week. On a daily basis, collect samples on a minimum of two workers per shift up to a maximum of five workers per shift. If the scope of work is performed utilizing non-friable methods, OSHA personal air monitoring will not be required, as long as a valid negative exposure assessment is provided by the Contractor prior to the beginning of work. If a negative exposure assessment can be generated during the initial shifts of a friable removal, continued OSHA personal air monitoring will not be required as long as the work procedures and personnel expertise establishing the negative exposure assessment are maintained. **Under OSHA Regulation 1926.1101, the Contractor's competent person (Supervisor) is allowed to collect personnel samples on the Contractor's employees. However, these samples must be analyzed by an accredited laboratory or persons that have had the NIOSH 582 course and are licensed by SCDHEC as an air monitor.**

PERSONAL MONITORING:

All personal air monitoring information shall be collected and analyzed using the OSHA Reference Method. Sample flow rate for personal samples shall not exceed 2.5 liters per minute (LPM). All samples shall be collected with the open-faced cassette in a downward position and located on the outside of the respirator and coveralls but in the worker's breathing zone. All samples shall be collected on 25 millimeter diameter mixed cellulose ester filters with a 0.8 micrometer pore size. Analysis of all personal samples shall be performed by phase contrast microscopy as described in the OSHA Reference Method and analysis shall be performed outside of the work area but on the work site on a daily basis.

TYPES OF PERSONAL MONITORING:

Time Weighted Average: Determination of employee exposure shall be determined on the basis of two or more samples representing full shift exposure for employees performing each separate task in the Work Area.

Monitored employees must wear monitoring equipment on their person while inside the containment or work area.

Excursion Samples: Thirty (30) minute Excursion Samples shall be collected each shift each day on each different task performed inside of the work area. These samples shall be collected at times when the highest exposure is expected to occur for the task (i.e. cleaning, scraping, staging, loadout, etc.) being performed.

Initial Monitoring: Monitoring performed initially shall be used to evaluate respirator protection in use and to determine if reduction to a respirator providing lesser protection is feasible or a negative exposure assessment is possible. Monitoring results that represent TWA exposure shall be used for this purpose. Initial monitoring shall be performed at the beginning of the project or if a significant change in Contractor personnel occurs. Twenty-five percent of the Contractor personnel shall be monitored during initial monitoring. Initial monitoring shall be performed during the first shift of the Contract and include both TWA exposure and Excursion Limit samples.

Continuous Monitoring: Continuous monitoring shall begin on the shift immediately after Initial Monitoring is complete and an initial exposure assessment has been established. Monitoring will continue throughout the second shift of the project in order to establish a negative exposure assessment. If a negative exposure assessment cannot be achieved, then continuous monitoring will be performed throughout the project duration. Continuous monitoring results shall also be used to determine if the respirator in use provides adequate protection and to document worker exposure. Monitoring shall be performed on 25 percent of the Contractor personnel each shift each day with monitoring rotation ensuring that all employees are monitored each week. All monitoring shall include both TWA exposure samples and Excursion Limit samples.

Samples must be collected during all times the Contractor is performing the work for the full duration of the work shift(s).

This includes prep work (i.e. - if Contractor's employees, or personnel, etc. enter the area of work and are in close proximity of asbestos containing material; or if there is any possibility of disturbance of the ACM in the Work Area). Note: No personal air monitoring is required for non-friable abatement procedures if a valid negative exposure assessment from a similar project is provided prior to the start of work.

REPORTING:

All personal monitoring results shall be posted at the Contractor's job site in the Clean Room in easy site of all employees prior to the start of the next shift. The posted monitoring results for each sample shall contain as a minimum:

- * project name and number
- * sample number
- * phase number or work area number
- * purpose (TWA or Excursion)
- * date collected
- * date of analysis
- * analytical method
- * name of person collecting sample
- * name of person analyzing sample
- * task performed by employee
- * location of employee
- * pump number
- * start and stop time
- * total minutes sampled
- * flow rate (liters per minute)
- * volume (liters)
- * numbers of fibers counted in samples
- * number of fibers counted in blanks
- * sample number of blanks used in calculation
- * number of fields counted
- * concentration in fibers per cubic centimeter (blank corrected)
- * name and social security number of sampled employee
- * respirator type worn by sampled employee
- * calculated TWA of sampled employee
- * graticule area of microscope used for analysis
- * L.O.D. - limit of detection - 10 fibers / 100 fields

A log of microscope calibration and pump calibration demonstrating daily adjustments of both shall be maintained on the job site and submitted at the conclusion of the project. The log shall include as a minimum:

Pump (daily entries)

- pump number
- pre-calibration flow rate (liters per minute)
- post-calibration flow rate (liters per minute)

calibration time, date and method
primary standard reference
name and signature of calibration person

Microscope (daily entries)

microscope serial number
verification of ocular phase ring centering
verification of HSE/NPL resolution test
results of blanks (10% daily, minimum 2)
results of blind recounts (minimum 1 daily)

NOTE: All personal air monitoring equipment shall be calibrated prior to each shift's sampling and verified throughout or at the end of the shift. Calibration devices shall be primary or traceable to a primary standard.

SUBMITTALS:

SUBMIT ONE COMPLETE SET OF SUBMITTALS TO THE BUILDING OWNER.

Before start of work submit the following to the Building Owner for review.

Submit the name and address of the Contractor's Testing Laboratory.

Submit Testing Laboratory's Written Hazard Communication's Program with MSDS's that will be kept on-site.

Submit a copy of the consulting license for the State of South Carolina Department of Health and Environmental Control.

Submit a copy of verification of completion of NIOSH Course No. 582 or equivalent for all personnel collecting and analyzing samples.

Submit verification of current completion of "Supervision of Asbestos Abatement Projects" Course or One (1) Day Supervision Refresher Course for each air sampling person.

Submit medical records and Respirator Training and Fit Test records for air samplers.

Submit proof of five year's air sampling experience (minimum).

Upon completion of work submit two copies of the following to the Building Owner for review.

Submit pump calibration log.

Submit microscope calibration log.

Submit a copy of all personal monitoring forms.

Submit a complete record certified by the Contractor's Testing Laboratory of all personal air monitoring results. This **must** be furnished to the Consultant and Owner by the Contractor within two weeks following completion of all personnel air monitoring.

PART 2 - PRODUCTS

All equipment and supplies will be as described by 29 CFR 1926.1101, Appendix B or equivalent unless otherwise mandated in this specification. Provide five additional personnel monitoring pumps as back-up for the duration of the Work.

PART 3 - EXECUTION

The Contractor's Testing Laboratory representative collecting personal samples shall enter the containment a minimum of two times per shift to verify operation of the equipment and to note tasks of the sampled employees. Contractor's air sampler must themselves, physically attach and remove personnel sampling pumps on asbestos employees being monitored.

End of Section 01405

SECTION 01410 - AIR MONITORING - ENVIRONMENTAL

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.

Air Monitoring: during work.

DESCRIPTION OF THE WORK

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

This section describes air monitoring carried out by the Owner 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.

AIR MONITORING:

Work Area Isolation: The purpose of the Owner's air monitoring is to detect faults in the work area isolation such as:

- Contamination of the building outside of the work area with airborne asbestos fibers,
- Failure of filtration or rupture in the differential pressure system,
- Contamination of air outside the building envelope with airborne asbestos fibers.

Work Area Airborne Fiber Count: The Owner's air monitor will monitor airborne fiber counts in the Work Area. The purpose of this air monitoring will be to detect airborne asbestos concentrations which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

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 air monitor will collect and analyze air samples utilizing TEM analysis. TEM samples shall be collected as per the AHERA Part 763 (Appendix A: Interim TEM Analytical Methods and Rules for Determining Completion of Abatement Actions). If the first round of TEM clearance samples fail, the Contractor shall bear the cost for the additional TEM sampling (collection and analysis) required.

SAMPLING AND ANALYTICAL METHODS

All PCM samples shall be collected using NIOSH Method 7400 Revision 3. All samples shall be collected at a flow rate between a minimum of 3, up to a maximum of 12 liters per minute (LPM). All samples shall be collected on mixed cellulose ester filters, 25 millimeters in diameter and 0.8 micrometer pore size. All samples shall be collected with a sufficient volume to measure less than 0.01 fibers per cubic centimeter (f/cc) as analyzed using phase contrast microscopy (PCM). A minimum representation of at least 2 ½ hours (at no less than 3 liters per minute nor greater than 12 liters per minute) for each 4 hour portion of the work shift during removal and cleanup activities shall be performed. Sampling shall be performed throughout the duration of each shift.

All samples shall be analyzed using NIOSH Method 7400 Revision 3 with the "A" Counting Rules. All samples collected shall be retained until final project completion. All samples shall be analyzed on site using PCM analysis by the Owner's Consultant. All samples collected for a shift shall be analyzed prior to the start of the next shift.

TYPES OF SAMPLES:

Baseline Samples: The Owner's Consultant will secure samples in the areas to be abated prior to any disturbance of asbestos or construction of the containment system. These samples will be collected at an appropriate flow rate determined by the Air Sampler and must represent a minimum volume of at least 1,500 liters. All samples will be collected five feet above the floor of the building. The samples will be collected to determine airborne concentrations prior to abatement but do not effect any clearance requirements. A minimum of five (5) Baseline Samples shall be collected on each floor level of 25,000 sf or less where the work for this project shall be performed under the direction of the Owner or his Consultant.

Daily Samples: The Owner's Consultant shall perform continuous environmental monitoring each shift each day throughout the project starting with construction of the containment system until the start of Clearance Monitoring. These samples shall represent the entire shift and be collected at a flow rate determined by the Owner's Consultant/Air Monitor based on site conditions. Sample volumes will be designed to avoid sample overloads.

At a minimum, the Owner's Consultant/Air Monitor shall conduct representative daily area sampling in the following locations:

- In the equipment room of the decontamination enclosure system,
- At the entrance to the clean room of each decontamination enclosure system,
- Outside of the controlled work area in uncontaminated areas of the structure or facility,

- And at the exhaust of the pressure differential equipment at a distance no greater than 5-8 feet from the exhaust flow - if feasible. (NOTE: When multiple pressure differential machines are in operation, the air sampler can rotate the sampling, but all exhausts must be monitored daily.)

Additional samples may be taken at Owner's or Owner's Consultant's discretion.

On a daily basis, the Environmental Air Monitor shall record (at a minimum) four readings of the Abatement Contractor's manometer (as required by SCDHEC Regulation 61-86.1 revised June 27, 2008.)

SAMPLING SENSITIVITY - LIMIT OF DETECTION - (LOD)

A minimum detection limit of 10 fibers per 100 fields will be used in the calculation of fiber concentrations for Environmental Monitoring. If 10 fibers cannot be counted, the results will be reports as "less than" the calculated concentration. A sufficient volume of air shall be collected to ensure all samples are either quantifiable or less than 0.01 f/cc using PCM analysis.

REPORTING:

All monitoring results shall be available to the Consultant prior to the start of the next shift. The monitoring results for each sample shall contain as a minimum:

- * project name and number.
- * phase number or work area number.
- * sample location.
- * sample number.
- * date collected.
- * date of analysis.
- * analytical method.
- * name of person collecting sample.
- * name of person analyzing sample.
- * pump number.
- * start and stop time.
- * total minutes sampled.
- * flow rate (liters per minute).
- * volume (liters).
- * numbers of fibers counted.
- * number of fibers counted in blanks.
- * sample number of blanks used in calculation.
- * number of fields counted.
- * concentration in fibers per cubic centimeter (blank corrected).
- * graticule area of microscope used for analysis.
- * L.O.D. - limit of detection - 10 fibers/100 fields

A log of microscope calibration and pump calibration demonstrating daily calibration of both shall be maintained on the job site and submitted at the conclusion of the project. The log shall include as a minimum:

Pump (daily entries)

pump number.
pre-calibration flow rate (liters per minute).
post-calibration flow rate (liters per minute).
calibration time, date and method.
primary standard reference.
name and signature of calibration person.

Microscope (daily entries)

microscope serial number.
verification of phase ring centering.
verification of HSE/NPL resolution test.
results of blanks (10% daily, minimum 2).
results of blind recounts (minimum 1 daily).

NOTE: All air monitoring equipment shall be calibrated prior to each shift's sampling and verified throughout or at the end of the shift. Calibration devices shall be primary or traceable to a primary standard.

SUBMITTALS:

PROVIDE ONE COMPLETE SET OF SUBMITTALS TO THE BUILDING OWNER.

Before start of work submit the following to the Owner for review:

Submit the name and address of the Consultant's Testing Laboratory.

Submit a copy of the Consultant's Testing Laboratory's Written Hazards Communication Program with MSDS's that is to be kept on-site.

Submit a copy of the consulting license for the State of South Carolina Department of Health and Environmental Control.

Submit a copy of verification of completion of NIOSH Course No. 582 or equivalent for all personnel collecting and analyzing samples.

Submit verification of current completion of "Supervision of Asbestos Abatement Projects"

Course or current One (1) Day Refresher Course for each air sampling person and proof of at least 5 years experience on similar projects.

Submit medical records for Consultant's Testing Laboratory air monitoring personnel.

Submit Respirator Training and Fit Test records for Consultant's Testing Laboratory air monitoring personnel.

Upon completion of work submit the following to the owner for review.

- Submit pump calibration log.
- Submit microscope calibration log.
- Submit a copy of all monitoring forms.

PART 2 - PRODUCTS

All equipment and supplies shall be equivalent to those described in NIOSH Method 7400 Revision 3 unless otherwise stated in this specification.

PART 3 - EXECUTION

The Owner's Air Monitor shall perform Baseline Sampling prior to disturbing any asbestos containing material or construction of the containment system and daily monitoring each shift each day throughout the project duration. The Owner's Air Monitor shall evaluate the Environmental Samples collected inside the contained Work Area and the Personal Samples each shift to ensure work is performed at an airborne concentration that prevents levels inside the worker's respirators from exceeding 0.1 f/cc. The Owner's Air Monitor shall enter the Work Area two times per shift as a minimum to observe work procedures and check sampling cassettes for overload. The Owner's Air Monitor shall work under the direction of the Owner or the Owner's Consultant.

Airborne Concentrations inside the Work Area will be maintained at the lowest achievable level.

AIRBORNE CONCENTRATIONS OUTSIDE THE WORK AREA

If any air sample collected outside of the Contained Work Area exceeds 0.01 f/cc, immediately stop all work and mist the work area with water. The Contractor shall then smoke test the entire perimeter of the Contained Work Area, with the Owner's Consultant to detect faults in the temporary enclosure. Any identified faults shall be immediately sealed by the Contractor.

The Contractor shall inspect the area outside of the Work Area in the vicinity of the air sample that exceeded 0.01 f/cc with the Consultant and, if contamination outside the Work Area is visible (i.e. water leaks, ACM debris) decontamination procedures shall be conducted under the direction of the

Consultant and the Owner.

Following the inspections of the interior and exterior of the Work Area, and upon receipt of Consultant's written approval, Contractor may resume work. Said approval shall not be deemed to absolve the Contractor of responsibilities resulting from elevated air count(s).

CONTAINMENT BREACH:

Upon discovery of any containment breaches (i.e. - water leak, damaged physical barrier, ACM debris outside the containment, etc.) the Consultant shall immediately collect, at a minimum, two PCM air samples for each breach in the Contractor's containment. Additional samples may be required to be collected if directed by the Owner. All analysis costs for containment breach samples shall be borne by the Contractor.

Normal air sampling shall continue in the affected area, with the next (second) sample being analyzed by PCM. If the result of the second sample is below 0.01 f/cc, the Contractor shall continue work.

If the result of the second sample is above 0.01 f/cc, the second sample shall be analyzed by Transmission Electron Microscopy (TEM). **The Contractor may not continue work while awaiting results of the TEM analysis unless approved in writing by both the Owner and the Consultant.**

If the result of the second sample, using TEM analysis is below 0.005 structures per cubic centimeter (s/cc), the Contractor shall continue work and normal air sampling will resume.

If the result of the second sample, using TEM analysis, is above 0.005 structures per cubic centimeter (s/cc) the Contractor shall install new critical barriers to isolate the affected area(s) from the balance of the building and decontaminate the affected area(s) using HEPA filter-equipped vacuum cleaners and wet-wiping methods under the direction of the Consultant. The cost of the TEM collection and analysis shall be borne by the Contractor.

End of Section 01410

SECTION 01411 - RESPIRATORY PROTECTION

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK:

Included in Contract Sum: The analysis cost described in this section is included in the Contract Sum.

Instruct and train each worker involved in asbestos abatement in proper respiratory protection 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 concentration encountered in the work place.

Any variance from this requirement must be approved in writing by both the Consultant and the Owner.

STANDARDS:

Except to the extent that more stringent requirements are written directly into the Contract Plans and Specifications, the following regulations and standards have the same force and effect (and are made a part of the Contract Plans and Specifications by reference) as if copied directly into the Contract Plans and Specifications, 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".
- ANSI - American National Standard Practices for Respiratory Protection, ANSI Z88.2-1980.

NIOSH - National Institute for Occupational Safety and Health

SUBMITTALS:

Before Start of Work submit the following to the Building Owner for review. Do not begin work until these submittals are returned with the Building Owner's approval indicating that the submittal is returned for use.

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.

System Diagram: When a Type "C" supplied air respiratory system is required by the work, submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in Work Area(s), routing of air lines to Work Area(s) from compressor.

Operating Instruction: Submit complete operating and maintenance instructions for all components and systems as a whole. Submittal is to be in bound manual form suitable for field use.

Respiratory Protection Program: Submit Contractor's written respiratory protection program manual as required by OSHA 29 CFR 1910.134 and 1926.1101.

Fit-Test Certification: Submit copies of qualitative fit test certifications for all personnel that will wear respirators. The certification must be current (within 1 year) and for all types of respirators worn by the workers.

Resume information: Submit resume and information on training for individual monitoring the operation of supplied air respiratory systems.

Testing Laboratory: Submit name of testing laboratory for compressed air analysis. The testing laboratory must be approved by the Building Owner and the Consultant.

AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS:

Provide air used for breathing in Type "C" supplied air respiratory systems that meets or exceeds standards set for by the Compressed Gas Association, Inc. for Type I Grade D, or better, compressed air.

LIMITING CHARACTERISTICS:

Compressed air used for breathing purposes must meet the quality standards of Type I Grade D, or better, air as required by OSHA 29 CFR 1910.134. The limiting characteristics for the compressed air at the point of delivery to the respiratory shall be as follows.

<u>Limiting Characteristic</u>	<u>Requirement</u>
Percent Oxygen (v/v)	19.5 - 23.5
Carbon monoxide (ppm)	10 (maximum)
Carbon dioxide (ppm)	1000 (maximum)
Condensed Hydrocarbons (mg/m ³)	5 mg per cubic meter
Odor	Not objectionable

NOTE: The Carbon monoxide alarm on the compressor must be set on 5 ppm and action must be taken by the Contractor to determine the cause of elevated Carbon monoxide levels.

COLLECTION: Compressed air samples must be collected for analysis. Field analysis will be acceptable.

Frequency of Sampling: Compressed air testing and analysis must be performed prior to use. Retesting must be performed before use each time the compressor is relocated and following 40 hours of continuous operation or following any system malfunction. The laboratory analysis report must be submitted to the Building Owner prior to use.

PART 2 - EQUIPMENT

AIR PURIFYING RESPIRATORS

Single use disposable respirators shall not be used during this project. Minimum respiratory protection shall be a reusable air purifying respirator equipped with high efficiency filters and approved by NIOSH.

Only respirator and respirator components tested and certified by NIOSH shall be used by personnel entering the Work Area.

SUPPLIED AIR RESPIRATOR SYSTEMS:

Provide equipment capable of producing air of the quality and volume required by the above reference standards applied to the job site conditions and crew size. Comply with provisions of this specification if more stringent than the governing standard.

Face Piece and Hose: Provide full face piece and hose by same manufacturer that has been certified by NIOSH as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure face-piece.

Backup air supply: Provide a reservoir of compressed air located outside the Work Area which will automatically maintain a continuous uninterruptible source of air automatically available to each connected face piece and hose assembly in the event of compressor shut-down, contamination of air delivered by compressor, power loss or other failure. Provide sufficient capacity in the back-up air supply to allow a minimum escape time of one-half hour times the number of connections available to the Work Area. Air requirement at each connection is the air requirement of the respirators in use plus the air requirement of an average-sized adult male engaged in moderately strenuous activity.

Warning device: Provide a warning device that will operate independently of the building's power supply. Locate so that alarm is clearly audible above the noise level produced by equipment and work procedures in use, in all parts of the Work Area and at the compressor. Connect alarm to warn of:

Compressor shut down or other fault requiring use of backup air supply
Carbon Monoxide (CO) levels in excess of 5 PPM/V

Carbon Monoxide (CO) Monitor: Continuously monitor Carbon Monoxide (CO) levels. Place monitors in the air line between compressor and back-up air supply and between backup air supply and workers. Connect monitors so that they also sound an alarm as specified under "Warning Devices." Ensure that the CO monitor is calibrated before use and after each relocation. A log shall be maintained with daily recording of CO levels.

Compressor Shut Down: Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sounded if any of the following occur:

Carbon Monoxide (CO) concentrations exceed 5 PPM/v in the air line between the filter bank and backup air supply.
Compressor temperature exceeds normal operating range.

Compressor Motor - Provide an electric compressor that can supply required air volumes based on the (number) of abatement workers utilizing this system.

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Compressor Location: Locate the compressor in a location that shall be approved by Owner's Consultant.

Airline Manifold Location: Manifolds for respirator airlines shall not be located in the Work Area. Locations shall be approved by the Owner and Consultant. All remote manifolds shall have pressure indicator showing pressure in p.s.i.

Air Intake: Locate air intake remotely from any source of exhaust or any exhaust from engines, motors, auxiliary generator or buildings.

PART 3 - EXECUTION

GENERAL:

Respiratory Protection Program: Comply with ANSI Z88.2 - 1980 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.134 and 29 CFR 1926.1101.

Require that (at a minimum) a full face Type C Pressure Demand Respirator be worn during each initial shift that asbestos may be disturbed or removed unless an initial negative exposure assessment can be produced utilizing historical documentation (previous air monitoring on "like" projects). Downgrading to the use of PAPR's or APR's may be permitted after each initial shift if all monitoring indicates that concentrations in the Work Area will not exceed the protection factor provided by a full face PAPR or half-face APR and with the approval of the Owner's Consultant. If fiber concentrations in the Work Area or personnel samples exceed 0.5 f/cc (except excursion samples [STEL]), workers shall immediately revert to Type C respiratory protection. The Contractor shall have available onsite the components for a fully functional Type C Supplied Air Respirator System at all times during the work of the contract.

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 02110.

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

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

FIT TESTING:

Initial Fitting: Provide initial fitting of respiratory protection during a respiratory protection course of training. 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.

On a Weekly Basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube.

Upon Each Wearing: Require that each time any 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 0.1 f/cc is the minimum level of protection allowed. A half-face air purifying respirator shall be the minimum allowable respirator used during removal.

Type "C" Supplied-air respirators: Full facepiece pressure demand supplied air respirators are to be used by all workers engaged in the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, or in the removal or demolition of asbestos insulation or coverings, or any other activity which results in airborne asbestos fiber concentrations at or above 0.5 fibers per cubic centimeter.

Powered Air Purifying Respirators: Filters for PAPR's must be HEPA type with TC numbers (tested and certified) by NIOSH. If any environmental or personal sample fiber concentrations reach or exceed 0.5 f/cc, workers shall immediately revert to the use of Type C respirators (excluding excursion sampling).

Flow rates of PAPR respirators must be checked daily and flow rate recorded in the Contractor's daily log book. The Owner's Consultant shall verify the Contractor's measurements for each shift.

Air Purifying Respirators with High Efficiency Filters: These half-mask respirators may be used during construction of the containment system and for removal of asbestos and during the loadout of asbestos waste from the waste loadout decon. Additionally, this respirator may be worn during disposal at the landfill. Filters for Air Purifying Respirators must be HEPA type with TC numbers (tested and certified) by NIOSH.

Protection Factors assigned to respirators are designed to ensure that employees do not exceed 0.01 fibers/cc exposure to asbestos inside the mask of the respirator. Maximum allowable concentrations for each allowed respirator type are listed below.

RESPIRATORY PROTECTION FACTOR:

<u>Respirator Type</u>	<u>Protection Factor</u>	<u>Maximum Concentration</u>
Air purifying: Negative pressure respirator High efficiency filter Half facepiece	10	0.1 f/cc
Powered Air Purifying (PAPR): Positive pressure respirator High efficiency filter Full facepiece	100	1.0 f/cc
Type "C" supplied air: Positive pressure respirator Pressure demand mode Full facepiece	1,000	10 f/cc
Type "C" supplied air: Positive pressure respirator Pressure demand mode Full facepiece Equipped with an auxiliary positive pressure Self-contained breathing apparatus (SCBA)	10,000	> 10 f/cc

AIR PURIFYING RESPIRATORS:

Powered air purifying and air purifying: 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.

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TYPE "C" RESPIRATOR:

Air Systems Monitor: Continuously monitor the air system operation including compressor operation, filter system operation, backup air capacity and all warning and monitoring devices at all times that system is in operation. The Contractor shall assign an individual, trained by manufacturer of the equipment in use, in the operation and maintenance of the system to provide this monitoring. Assign no other duties to this individual which will take him away from monitoring the air system.

EXTRA RESPIRATORS:

Provide on site one respirator of each type (PAPR, and Type C) for Owner's use in entering the Work Area.

Provide on site in a sealed bag at the entrance to the Decontamination Unit, two respirators of each type (PAPR and Type C) for use by emergency personnel. The respirators shall be readily visible, sealed in bags and labeled for "Emergency Use Only."

Preparation work performed prior to the disturbance or removal of asbestos may be performed in full body coveralls and using half-face air purifying respirators.

Loadout of waste and transportation to landfill can be performed in full body coveralls and using half face negative pressure respirators.

END OF SECTION - 01411

SECTION 01412 - WORKER PROTECTION - ASBESTOS ABATEMENT

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK:

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

RELATED WORK SPECIFIED ELSEWHERE:

Respiratory Protection: is specified in Section 01411.

WORKER TRAINING:

All workers are to be accredited as Abatement Workers as required by the South Carolina Regulation 61-86.1 (revised). This training course or appropriate update should conform to this South Carolina Statute.

Train, in accordance with 29 CFR 1926, 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

The meaning of Asbestos Warning Signs

Requirements of medical surveillance program

Review of 29 CFR 1926 and South Carolina Asbestos Regulations

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 will enter the Work Area for any reason. Examination shall as a minimum meet OSHA requirements as set forth in 29 CFR 1926.1101 (M). In addition, provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker. Provide name, address and telephone number of examining physician.

SUBMITTALS:

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

South Carolina Regulation 61-86.1(revised): Submit copies of certificates from a SCDHEC/EPA-approved Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by this South Carolina Statute.

State and Local License: Submit evidence that all workers have been trained, certified and accredited as required by the South Carolina Department of Health and Environmental Control.

Certificate Worker Acknowledgement: Submit an original signed copy of the Certificate of Worker's Acknowledgement for each worker who is to be at the job site or enter the Work Area.

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 Social Security Number

Physicians Written Opinion signed by the 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 and the synergistic effect of asbestos exposure and smoking.

Copy of information that was provided to physician in compliance with 29 CFR 1926.1101 (M).

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

Notarized Certifications: Submit certification signed by an officer of the abatement contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept in conformance with 29 CFR 1926.

PART 2 - EQUIPMENT 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.

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

Hard Hats: Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner, and Consultant. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean, decontaminate and bag hats before removing them from Work Area at the end of the work.

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 by the Contractor for the Owner, Consultant, and other authorized representatives and Emergency Personnel who may inspect the job site. Provide two (2) respirators and six (6) complete coveralls and, respirator filters. This includes two (2) Type C respirators and two (2) PAPR's specifically labeled "Emergency Use Only" and hung in a sealed bag at the entrance to the Decon.

PART 3 - EXECUTION

GENERAL:

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

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

DECONTAMINATION PROCEDURES:

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

Type C Supplied Air or 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. 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:

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, and 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 the 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.

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 previously described, and then dress in street clothes before entering the non-Work Areas of the building.

CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT:

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

Employment Eligibility Verification (Form I-9):

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

END OF SECTION - 01412

SECTION 02020 - SUMMARY OF WORK - ASBESTOS ABATEMENT

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings, general provisions of Contract, including General and Supplementary Conditions, and other Division-1 Specification Sections, apply to work of this section.

PROJECT NAME: Abatement of Exterior Transite from Mechanical Penthouse
Facility Located at 1600 Hampton Street
Columbia, South Carolina

ASBESTOS REMOVAL CONSULTANT:

Environmental Consulting Services, Inc.
736-D St. Andrews Road # 196
Columbia, SC 29210
Don Cobb SCDHEC Licensed Project Designer # 22082
803/772-1070

Specifications are dated March 1, 2013.

Contract Plans and Specifications: Indicate the work of the Contract and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the Contract Plans and Specifications include, but are not necessarily limited to the following:

Applicable codes and regulations.

Notices and permits.

Existing site conditions and restrictions on use of the site.

Alterations and coordination with existing work.

Work to be performed concurrently by separate contractors.

Alternates.

Pre-purchased subcontracts for the Contract, with subcontract amounts included in the Contract Sum.

Requirements for partial Owner occupancy prior to substantial completion of the Contract Work.

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Summary by References: Work of the Contract can be summarized by references to the Contract, General Conditions, Supplementary Conditions, Specification Sections, Drawings, addenda and modifications to the Contract Documents issued subsequent to the initial printing of this project manual and including but not necessarily limited to printed material referenced by any of these. Work of the Contract is also unavoidably affected or influenced by governing regulations, natural phenomenon including weather conditions and other forces outside the contract documents.

PROJECT DESCRIPTION:

Environmental Consulting Services, Inc. was contacted by Ty Russell of the University of South Carolina to generate a site specific design specification for this project. It is our understanding that the asbestos inspection for this work was performed by USC personnel. ECS, Inc. will not be responsible for any discrepancies in sampling strategy, any difference in number of samples required by SCDHEC, results, square or linear footages determined by USC for this project, etc. It is our understanding that the results of this sampling will be provided by USC to project bidders. The estimated square footage amounts that were provided to ECS, Inc. from USC are being included in this specification. These amounts are approximates and must be confirmed by the bidding and awarded Contractors.

It will also be the responsibility of the Bidding Contractors and the awarded Abatement Contractor to perform a pre-construction visual inspection of all materials (and amounts) involved in the project. Any concerns or questions about conditions of materials must be brought to the attention of the Owner prior to the project beginning.

For any friable removal procedures, the work for this project will also include: temporary facilities, any required protection for all operational electrical or mechanical systems located in the Work Area; and pre-cleaning and protection of any equipment or supplies located in the Work Area. The work also includes: complete decontamination of the Work Areas after removal; encapsulation of all surfaces in the Work Area (if required); and project closeout submittal documentation. Any variances for work procedures must be obtained by the Contractor from SCDHEC prior to the beginning of the project.

POTENTIAL ASBESTOS HAZARD:

The disturbance or dislocation of asbestos-containing materials may cause asbestos fibers to be released into the building's atmosphere, thereby creating a potential health hazard to workmen and building occupants. Apprise all workers, supervisory personnel, subcontractors, and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state, and local agencies.

STOP WORK:

If the Owner presents a written stop work order immediately and automatically stop all work. Do not recommence work until authorized in writing by Owner. The Owner's Consultant's stop work authority is limited to only situations that is immediately life threatening.

OWNER OCCUPANCY:

Full Owner Occupancy: The Owner will not occupy the construction area during abatement. Cooperate fully with the Owner or his Consultant during construction operations to minimize conflicts and to facilitate Owner's activities at adjoining areas. Perform the work so as not to interfere with the Owner's operations.

PART 2 - PRODUCTS: N/A

PART 3 - EXECUTION:

SUMMARY OF WORK:

All work will be performed under the direction of the Owner. All stairwells and entrances providing access to the Work Area shall have proper signage and barrier tape to notify other on-site employees (unauthorized personnel) so as to prevent unauthorized entry to the areas of the work (if required).

The Contractor shall be required to coordinate with the Owner on the removal, shutdown, or protection of any equipment that could be affected by the work being performed. All electrical drop cords and equipment shall be GFCI protected.

HVAC Systems: The power to all heating, ventilation, and air conditioning systems that are within the regulated area shall be deactivated and locked out. All ducts, grills, access ports, or vents shall be sealed off with two (2) layers of six (6) mil virgin poly.

1. Coordinate with the Owner to remove, shutdown, or protect any roof equipment that will be affected by the work of this project. The Contractor shall coordinate with the Owner to de-energize and lock-out all electrical circuits feeding any conduit which may lay on top of the roof prior to starting any work. The Contractor shall note that if portions of the conduit are broken, exposing the wires inside, the Contractor shall seal broken conduit leak-tight with poly and duct tape.

Lockout/Tagout: Lockout and tag-out all existing power to or through the work area as described below. 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. Ensure all requirements of 29 CFR 1910.147 "Lockout/Tagout" are followed.

Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. Tag and label breakers with tag tied to 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 serving these circuits. Tag and label breakers with tag tied to breaker with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to Contractor, Owner and 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. Electrocutation hazard."

2. Shut down, isolate, and lockout all fresh air intakes as directed by the Owner and seal with two (2) layers of six (6) mil polyethylene and duct tape prior to commencing removal activities.
3. The work will be the proper removal and disposal of 4' X 8' sheets of asbestos containing cementitious board (transite). There is approximately 3,500+ sf of this material applied to the exterior concrete block finish of the mechanical penthouse. This is an estimate and it will be the bidding Contractor's responsibility to confirm square footages. The panels are attached to the concrete block through the use of wood furring strips that have been anchored to the concrete block walls. The panels are attached to the wood furring strips with screws and nails. The Contractor shall place a six (6) mil poly drop cloth at the base of each work space (i.e. – walls) in order to capture any of the broken pieces of the transite that may fall during the removal process. The Contractor shall attempt to remove the panels as intact as possible; however, it is anticipated that areas that have been nailed (i.e. – edges of board) may be damaged during the removal process.
4. Any broken panels shall be placed directly into six (6) mil properly labeled bags, or wrapped in sections of two layers of six (6) mil poly and properly labeled. Seal bags or poly with duct tape.
5. Wet-wipe first disposal bag and place bagged materials to be disposed of as ACM into another properly labeled six (6) mil polyethylene bags and seal with duct tape or properly label poly-wrapped materials with appropriate signage. Once asbestos panels have been removed from wood furring strips, the Contractor shall also remove the wood furring strips from the concrete block wall. Properly wrap and seal debris in six (6) mil poly, properly labeled, and sealed with duct tape

for disposal as contaminated debris. Upon completion of removal of the furring strips and anchors from the concrete block walls, the Contractor shall patch ALL penetrations, cracks, or voids (either created by the attachment of the furring strips or previously existing) with blocks, or mixture of block and mortar mix if needed. This is to ensure the weather tightness of the penthouse prior to a new exterior finish being installed.

6. Cleanup all remaining loose debris from any decks and/or parapets and place into properly labeled six (6) mil polyethylene bags. Contaminated poly drop cloths shall also be placed into six (6) mil poly bags with proper signage attached. Dispose of all bagged or poly wrapped materials as contaminated debris. No dry sweeping of the roof decks will be allowed. All residual dust shall be HEPA vacuumed as the work progresses. Mist roof decks to control dust emission prior to HEPA vacuuming.
7. Lower all double-bagged waste or poly wrapped waste from the roof to the ground by means of an approved conveyance system. This must be performed by the end of each work shift (per OSHA 1926.1101).
8. Place all double bagged or double wrapped waste into a six (6) mil poly-lined enclosed transport truck or a six (6) mil poly-lined construction dumpster. The location for positioning of the transport truck or dumpster shall be designated by the Owner. The Contractor shall be responsible to provide the container and placement of it prior to the starting of work. If a transport truck is used to move bagged materials, it must be lined with clear six (6) mil polyethylene and have a double poly flapped doorway (marked with appropriate OSHA warning signs) behind a lockable door with appropriate asbestos NESHAP danger signs attached to the rear sides of the vehicle (NESHAP danger signs will be attached to truck ONLY during loading and unloading - NOT during transportation).

The NESHAP signs shall read as follows: **DANGER**

**ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

The OSHA Warning Sign shall have the following legend:

**DANGER
ASBESTOS
AUTHORIZED PERSONNEL ONLY
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA**

9. Name and address of approved landfill where asbestos-containing waste materials are to be buried will be supplied by the Contractor.

Contact entity for transfer of possession of asbestos contaminated or asbestos containing waste

materials will be supplied by the Contractor.

Immediately following transfer of asbestos contaminated or asbestos containing materials, submit copies of all manifests and disposal site receipts (2 Completed Forms) as follows:

- 1) Contractor will retain one copy.
- 2) Owner will retain one copy.

Secure and retain receipts from landfill operator for materials disposed of.

10. After completion of asbestos related work, the Owner will inspect the areas of work to determine if further cleaning is required. If the Owner determines that the area is not adequately cleaned of possible ACM residues, the entire area will be re-cleaned and encapsulated (if required).

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.

Restrict Access: Maintain existing access restrictions to areas with active electrical equipment. Allow access to area only to qualified tradespersons with prior experience in the installation and repair of involved equipment.

Personnel: 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.

Conduit: Decontaminate all electrical circuit conduit.

Dispose of all asbestos containing material (ACM) and asbestos contaminated waste material (ACWM) removed from the Work Area(s).

Decontaminate the Work Area(s). Encapsulate the Work Area (s) – if required.

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Perform and satisfactorily obtain Work Area clearance monitoring (if required).

Disassemble and remove any temporary work platform(s), primary and critical barriers, temporary physical barriers, decontamination units, and pressure differential systems.

Perform any final cleaning as required by the Owner.

CONTRACTOR USE OF PREMISES:

General: The Contractor shall limit his use of the premises to the work indicated.

Use of the Site: Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the work while engaged in project construction.

Keep existing driveways and entrances serving the premises clear and available to the Owner and his employees at all times. Do not use these areas for parking or storage of materials.

Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary obtain and pay for such storage off site.

Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place or accessible to unauthorized persons.

Keep public areas such as hallways, stairs, and toilet rooms free from accumulation of waste, rubbish or construction debris.

Smoking or open fires will not be permitted on the premises.

Use of existing toilets within the complex by the Contractor and his personnel may not be possible. The Contractor must be prepared to supply portable toilets. Areas will be designated by the Owner for portable toilets.

Worker will dress accordingly when not in asbestos removal garb. No short pants or sleeveless shirts (tank tops) are allowed. No interaction with onsite personnel will be allowed. No vulgar gestures or language will be allowed.

END OF SECTION 02020

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SECTION 02025 - TEMPORARY FACILITIES

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

DESCRIPTION OF REQUIREMENTS:

General: Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.

SUBMITTALS

Before the Start of Work: Submit the following to the Building Owner for review. Begin no work until these submittals are returned with Building Owner's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.

Decontamination Unit Sub-panel: Submit product data.

Ground Fault Circuit Interrupters (GFCI): Submit product data.

Lamps and Light Fixtures: Submit product data.

Fire Extinguishers: Provide product data. Submit schedule indicating number of fire extinguishers and location at job site.

PART 2 - PRODUCTS

MATERIALS AND EQUIPMENT:

General: 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.

WATER SERVICE:

Temporary Water Service Connection: All connections to the Owner's water system shall include backflow protection. 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.

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: may be secured from the building hot water system, provided backflow protection is installed at point of connection as described in this section under Temporary Water Service connection, and if authorized in writing by the Owner. If building hot water system is inaccessible, the Contractor shall provide a hot water heater capable of servicing the number of employees on the project for any given shift.

FIRST AID:

For First Aid Attention Contact: Dial 911 for access.

FIRE EXTINGUISHERS:

Fire Extinguishers: Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.

PART 3 - EXECUTION

INSTALLATION - GENERAL:

General: 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.

WATER SERVICE:

General: Water connection (without charge) to Owner's existing potable water system is limited to one 3/4" pipe-size connection, and a maximum flow of 10 gpm each to hot and cold water supply. The Owner will provide hook-ups for water (source only). Hot water shall be supplied at a minimum temperature of 100 F. Supply hot and cold water to the Decontamination Unit that is

adjustable at the water tap in the shower:

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 SERVICE:

General: 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.

The Contractor Shall:

Lockout/Tagout: To or through the work area as described below. 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 generator(s) and electrical panel(s) described below. Ensure all requirements of 29 CFR 1910.147 "Lockout/Tagout" are followed.

Lockout power to Work Area by switching off all breakers serving power or lighting circuits in work area. Tag and label breakers with tag tied to 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 serving these circuits. Tag and label breakers with tag tied to breaker with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to Contractor, Owner and 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 electrical supply. Protect with circuit breaker or fused disconnect. Locate temporary panel as directed by Owner or Owner's Consultant.

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.

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 electrical supply. Protect with circuit breaker or fused disconnect.

THE CONTRACTOR SHALL PROVIDE:

Power Distribution System:

Portable Electrical Generator(s): Of sufficient size to provide necessary electrical requirements (if required).

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 2000 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 Air Sampling Firm's exclusive use while conducting air sampling during the work as follows:

One in each work area

One at clean side of each Decontamination Unit.

One at each exhaust location for HEPA filtered fan units.

110-120 volt 20 amp branch circuits with 4-gang outlet for Air Monitoring Firm's exclusive use for conducting final air sampling.

Five inside work area.

Two outside work area in location designated by the Consultant.

TEMPORARY LIGHTING:

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. 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 to supply a 100 footcandle minimum light level. Consultant will monitor illumination levels with a photometer throughout the project.

Provide lighting in any area being subjected to a visual inspection as required to supply a 150 footcandle minimum light level.

Provide lighting in the Decontamination Unit(s) [personnel and waste loadout] as required to supply a minimum of 10 footcandle light level.

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.

END OF SECTION - 02025

SECTION 02030 - TEMPORARY ENCLOSURES

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

SUBMITTALS:

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

Spray Cement: Submit following:

Product description including major components and solvents.

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

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 spray cement material proposed for use on the work. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

Signs: Submit samples of signs to be used.

PART 2 - PRODUCTS

Polyethylene Sheet: Provide six (6) or four (4) mil polyethylene film as indicated. Provide largest size possible to minimize seams, six (6) or four (4) mils thick as indicated, frosted or black as indicated.

Reinforced Polyethylene Sheet: Provide single reinforced first run translucent polyethylene sheeting in the largest sheet size possible to minimize seams; four (4) mil, six (6) mil, or ten (10) mil thick - frosted, black, or opaque.

Framing: Framing of any and all barriers and enclosures shall be of conventional wood framing - any grade, any species.

Wall Studs: 2 X 4 wood studs - any grade, any species.

MISCELLANEOUS MATERIALS:

Caulk: Provide silicone caulking (if required). Siliconized caulking is unacceptable.

Fire-Stop Sealant: Provide a U.L. approved fire-stop sealant with a class I rating, a flame spread of 25 or less, and a smoke density of 450 or less in accordance with Flammability Test ASTM E84. Provide a fire-stop sealant that is an acceptable product to be left in place in the most recent Fill, Void, or Cavity Materials Sections of the U.L. Fire Resistant Directory.

Foams: Insta-Foam, Type IFS - RTV Foam
Dow Corning, 3-6548 Silicone RTV Foam
General Electric, Type RTV 800, 850, and 851 Silicone Foam

Putty: American Vamag, Type FRP-1 Putty
3M, Fire Barrier Caulk CP-25 and Putty 303
Minnesota Mining, Type CP-25 S/L and N/S Caulks, Type MP Putty

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.

Material Safety Data Sheets: Are required for all chemicals, foams, putties, caulks, etc.

PART 3 - EXECUTION

SEQUENCE OF WORK:

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

GENERAL:

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-control 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 02090. 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 and preclean 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 equipment shall be considered outside the work area unless covering plastic or seal is breached.

EMERGENCY EXITS:

Provide emergency exits and emergency lighting as set forth below:

Emergency Exits: At each existing personnel decon and waste load out, display, on the work area side, a sign that reads:

EMERGENCY EXIT - Red Letters

**IN CASE OF LIFE THREATENING EMERGENCY, EXIT IMMEDIATELY -
Black Letters**

If power failure occurs and temporary lighting is lost, workers are to remain still until power can be restored or emergency lighting is provided to allow egress from the work area. Note: Workers remain in Work Area only if the situation is not life threatening (Life threatening is considered to be a fire or heart attack or similar emergency).

CONTROL ACCESS:

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

Do not obstruct doors required for emergency exits from Work Area or from building.

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

Install temporary doors with hasps and padlocks that are lockable from the outside and always unlocked and operable from the inside.

Provide one key for each padlock to Owner and the Consultant, and maintain one key in clean room of decontamination unit (3 total).

Install on second poly-flap at entrance towards Work Area in Decon the following sign that reads:

LEGEND

DANGER
ASBESTOS
AUTHORIZED PERSONNEL ONLY
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA

All signs must be printed in English and Spanish.

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

ALTERNATE METHODS OF ENCLOSURE:

Alternate methods of containing the Work Area may be submitted to the Consultant for approval in accordance with procedures set forth in Section 01100 Product Substitution. Do not proceed with any such method(s) without prior written approval of the Owner and Consultant.

TEMPORARY PHYSICAL BARRIERS:

Access to the Work Area shall be permitted only through the Personnel Decontamination Unit. Completely separate the Work Area enclosure from other areas of the building and the outside by installing temporary physical barriers at all doorways, or other openings in the Work Area. Seal all seams in these barriers with silicone caulk.

Permit access to the Work Area only through the personnel decontamination unit. Completely separate the Work Area from other portions of the building and the outside by installing temporary physical barriers at all doorways, elevators, and other openings into the Work Area, as designated on the drawings. Seal all seams in barriers airtight with silicone caulking.

CRITICAL BARRIERS:

Decontaminate and individually seal all equipment such as, but not limited to: electrical control panels, conduit joints, junction boxes (inside and outside), disconnect switches, and other equipment designated to remain with two layers of six (6) mil polyethylene sheeting and/or duct tape critical barrier.

At the Contractor's option, un-insulated piping, valves, fittings, electrical conduits designated to remain, hangers, etc. shall be cleaned and covered with one (1) layer of six (6) mil polyethylene and/or duct tape prior to abatement or left unprotected during abatement. All such unprotected items shall be thoroughly decontaminated at the completion of removal activities.

END OF SECTION - 02030

SECTION 02040-PRESSURE DIFFERENTIAL SYSTEM

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

MONITORING:

Continuously monitor and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder (e.g. strip chart). The Air Monitor for the Owner will read and record the pressure differential four (4) times during each work shift as required by SCDEHEC.

SUBMITTALS:

The Contractor shall submit data on Manometers utilized to monitor pressure differential at Personnel and Equipment Decontamination Units. Differential pressure meters (Manometers) shall be equipped with a continuous recorder. Manometers shall be equipped with a warning buzzer which will sound if pressure differential drops below -0.02" of water. Submit Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of Work Area (Section 02040).

On a weekly basis: Submit printout from pressure differential monitoring equipment. Mark printout with date and start of time for each day. Use printout paper that indicates elapsed time in intervals no greater than hours. Indicate on each day's record times of starting and stopping abatement work, type of work in progress, breaks for lunch or other purposes, periods of stop work, and filter changes. Cut printout into segments by day, attach to 8 1/2" by 11" paper. Label with project name, contractors name and date.

The Contractor shall submit data on HEPA filtered fan units. Collect Product Data into a single submittal. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".

Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

- Manufacturer's printed recommendations.
- Compliance with recognized trade association standards.

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Compliance with recognized testing agency standards.
Application of testing agency labels and seals.
Notation of dimensions verified by field measurement.
Notation of coordination requirements.

PART 2 - PRODUCTS:

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.

Cabinet: Constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches to fit through standard-size doorways. Provide units whose cabinets are:

Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance

Arranged to provide access to and replacement of all air filters from intake end

Mounted on casters or wheels

Fans: Rate capacity of fan according to usable air-moving capacity under actual operating conditions.

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. All units will have new (unused) HEPA filters installed prior to incorporation into containment.

Provide units with a continuous rubber gasket located between the filter and the filter housing to form a tight seal.

Provide new (unused) HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.

Provide filters that are marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.

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Prefilters, which protect the HEPA 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.

Instrumentation: Provide units equipped with:

Magnehelic gauge to measure the static pressure drop across filters and indicate when filter has become loaded and needs to be changed

A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge affixed near the gauge for reference, or the Magnehelic reading indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) air delivery at that point

Elapsed time meter to show the total accumulated hours of operation

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 of

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.

Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide products of the following: (Or Approved Equal)

Critical Systems "Honker 18K"
5815 Gulf Freeway
Houston, Texas 77023

Aerospace America, Inc. "Aero-Clean 2000"
900 Truman Parkway
P.O. Box 189
Bay City, Michigan 48707

Asbestos Control Technology, Inc. "Micro-Trap"
P.O. Box 183
Maple Shade, NJ 08052

Control Resource Systems, Inc. "Hog" 2000
670 Mariner Drive
Michigan City, Indiana 46360

Global Consumer Services, Inc. "Red Baron"
1721 N. Highland Avenue
Los Angeles, CA 90028

Tri-Dim Filter Corporation "ACCU-2M"
1431 West Lake Street
Chicago, Illinois 60607

PART 3 - EXECUTION

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.

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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. The Contractor shall provide Manometers to measure pressure differential in the Work Area from the areas outside the Work Area. One Manometer required per work area. Also provide one backup Manometer. 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, personnel and equipment decontamination units.

Establish isolation by increased pressure in adjacent areas or as part of seals where required.

Exhaust a sufficient number of units from the work area to develop the required pressure differential and required four (4) air changes per hour.

The required number of units is the number determined plus one additional unit per six units as a backup during filter change or unit breakdown.

HEPA units may be piggy-backed to allow proper number of units required so as to maintain adequate working space in the containment. Place one 2k unit on top of another unit and exhaust either separately or together with the use of a sheet metal "Y" connector. Ensure that single outlet of "Y" connector is large enough in diameter to permit exhaust without causing back pressure to piggy-backed units. This restriction or back pressure could cause unit shutdown.

Mount units to exhaust directly or through disposable ductwork.

Use only new ductwork except for sheet metal connections and elbows.

Use ductwork and fittings of same diameter or larger than discharge connection on fan unit.

Use inflatable, disposable plastic ductwork in lengths not greater than 100 feet.

Use spiral wire-reinforced flex duct in lengths not greater than 50 feet.

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Arrange exhaust as required to inflate duct to a rigidity sufficient to prevent flapping.

If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet of spiral wire reinforced flex duct after direction change.

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.

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 requirements 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 End of Unit at 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.

Decontamination Units: Arrange Work Area and decontamination units so that the majority of make up air comes through the Decontamination Units. Use only personnel or equipment Decontamination Unit at any time and seal the other so that make up air passes through unit in use.

HEPA Filtered Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area by making openings that allow air from outside the containment building into the Work Area. Cover with weighted 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.

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AIR CIRCULATION IN DECONTAMINATION UNITS:

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:

General: 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 "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 the Consultant.

The Contractor Shall:

Demonstrate Condition of Equipment for each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of the following:

Squareness of HEPA Filter

Condition of Seals

Proper operation of all lights

Proper operation of automatic shut down if exhaust is blocked

Proper operation of alarms

Proper operation of magnehelic gauge

Proper operation and calibration on pressure monitoring equipment

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Demonstrate Operation of the pressure differential system to the Consultant including, 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.

Use a differential pressure meter or manometer to demonstrate the required pressure differential at every barrier separating the Work Area from the balance of the building, equipment, and ductwork or outside.

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 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 lockdown encapsulation procedures, unless authorized by the Owner 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 seal all openings 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 02090, 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.

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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 six (6) mil polyethylene. Remove and dispose of all HEPA filters as contaminated waste.

END OF SECTION - 02040

SECTION 02050- DECONTAMINATION UNITS

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Provide separate Personnel and Equipment Decontamination facilities as per requirements of this section. Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit. If personnel or equipment decontamination facilities are constructed inside the Work Area, they must be constructed to provide a load bearing capability of 100 pounds per square foot. The Contractor may submit alternative decon setups for approval by the Consultant. Do not use an alternative setup unless approved by the Consultant.

RELATED WORK SPECIFIED ELSEWHERE:

Refer to Section 02025 Temporary Facilities - Asbestos Abatement for electrical requirements and requirements relative to connection of decontamination facilities to building systems such as water, sewer, and electrical.

SUBMITTALS

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

Shower Pan: Provide shop drawing.

Shower Walls: Provide product data.

Shower Head and Controls: Provide product data.

Filters: Provide product data and shop drawing of installation on decontamination unit.

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Hose Bib: Provide product data.

Shower Stall: for Wash Down Station provide product data and shop drawing showing and modifications.

Elastomeric membrane: Provide product data.

Lumber: Provide product data on fire resistance treatment (if required).

Sump Pump: Provide product data.

Signs: Submit samples of signs to be used.

PART 2 - PRODUCTS

Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 4.0 or 6.0 mil thick as indicated, clear, frosted, or black.

G.E. - SCS 1000 Series Silicone Sealant: or approved equivalent.

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.

Shower Pan: Provide one piece waterproof shower pan 4' x 8' by 6" deep. Fabricate from seamless fiberglass minimum 1/16" thick reinforced with wood, 18 ga. stainless or galvanized steel with welded seams, copper or lead with soldered seams, or a seamless liner of minimum 60 mil thick elastomeric membrane.

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

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

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 to sanitary sewer (no storm drains).

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

Hose Bib: Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4" National Standard male hose outlet.

Shower Stall: For Wash Down Station provide leak tight shower enclosure with integrated drain pan fabricated from fiberglass or other durable waterproof material, approximately 3' x 3' square with minimum 6' high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4'-0" above drain pan. Connect drain to a reservoir, pump water from reservoir through filters to a drain or store and use for amended water. Mount filters inside shower stall on back wall beneath hose bib.

Lumber: Provide 2 X 4 wood studs of kiln dried lumber of any grade or species.

Plywood: Provide 1/2" thickness plywood sheathing. When specified, provide plywood that is labeled as meeting Standard 701 of the National Fire Protection Association.

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

PART 3 - EXECUTION

PERSONNEL DECONTAMINATION UNIT:

Provide a Personnel Decontamination Unit consisting of a serial arrangement of connected rooms or spaces, Clean Room, Shower Room, and 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. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 10 footcandles.

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.

Exterior Decontamination Unit (if required)

Construct outer walls of entire Decon with minimum 1/2" plywood, any grade, and caulk adjoining edges with silicone based caulking to provide an airtight seal between the Decontamination Unit and the rest of the building. NOTE: Siliconized caulking is unacceptable. Line interior surfaces with 2 layers of six (6) mil poly. Provide 3 layers of clear six (6) mil poly on flooring surfaces.

Framework for outer walls shall be 2" x 4" studs any grade or species.

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

Separate Changing Room from the building exterior by a plywood doorway with a padlockable HASP on the exterior side with air louvers to permit inflow of air towards work area.

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.

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.

Provide one storage locker per employee that is lockable with the name and social security number of the employee.

Provide two storage lockers that are lockable for visitors.

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

Separate access to this room from Shower and Changing Room by sheet plastic flapped doorways (6 mil). (Refer to drawings for proper configuration.)

Separate this room from the rest of the building with airtight walls fabricated of 1/2"

plywood and 2 layers of six (6) mil poly on interior surfaces. Provide 3 layers of clear six (6) mil poly on flooring surfaces.

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.

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.

Separate this room from the rest of the building with airtight walls fabricated of 1/2" plywood with 2 layers of six (6) mil poly on interior surfaces.

Separate access to this room from the Airlock with sheet plastic flapped doorways. (Refer to drawings for proper configuration.)

Provide splash-proof entrances to the Airlock with doors arranged in the following configuration:

At each entrance to the Shower Room construct a door frame out of nominal 2" x 4" lumber with 3/4" jambs (sides) and 3/4" head (top) and sill (bottom). Attach to this door frame three fully overlapping flaps of six (6) mil polyethylene material, fastened at the head (top) and jambs (sides) (by clamping between a 1-1/2" x 3/4" batten and frame). All opposed flap door entrances shall be fully overlapped in a direction that presents a shingle-like configuration to the water stream from the shower. Overlap sill (bottom) by 1-1/2" minimum. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.

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 liquid soap dispenser and a continuous adequate supply of liquid 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.

Inspect area around shower pan daily for indications of water leaks.

Pump waste water to sanitary sewer drain. Provide 20 micron and 5 micron waste water filters in line to drain. Change filters as required (filter loading). Locate filters inside shower unit so that water lost during filter changes is caught by shower pan.

Provide hose bib.

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

Separate this room from the rest of the building with airtight walls fabricated of 1/2" plywood overlaid with 2 layers six mil on interior surfaces. Provide 3 layers of clear six (6) mil on flooring surfaces.

Separate access to this room from the Equipment Room and Shower Room with flapped doorways fabricated of six (6) mil polyethylene. Refer to drawings for proper configuration.)

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 rest of the building with airtight walls fabricated of 1/2" plywood overlaid with six (6) mil poly, 2 layers on interior surfaces. Provide 3 layers of clear six (6) mil on flooring surfaces.

Separate access to this room from the Shower Room Airlock and Work Area with flapped doorways fabricated of 6 mil polyethylene. (Refer to drawings for proper configuration.)

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 three (3) layers of plastic at all times. Use only clear plastic to cover floors.

Work Area: Separate access to Work Area from the Equipment Room by three opposed polyethylene flaps, six (6) mil thickness. Damp wipe clean all surfaces after each shift change. Provide one additional floor layer of clear six (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.

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, and gloves are to be stored in contaminated end of the Equipment Room.

Disposable coveralls are placed in a properly labeled six (6) mil polyethylene bag for disposal with other material.

After showering, the worker moves to the Changing Room and dresses in either new coveralls for another entry or street clothes if leaving.

EQUIPMENT DECONTAMINATION UNIT:

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

Arrange with airlocks between rooms as required below.

Wash Room: provide wash room for cleaning of bagged or containerized asbestos-containing waste materials passed from the Work Area.

Construct wash room of nominal 2" x 4 wood framing and 1/2" plywood, lined with clear six (6) mil polyethylene and located so that packaged materials, after being wiped clean, can be passed to the Holding Room.

Separate this room from the Work Area by a three-layered opposed flapped door of clear six (6) mil polyethylene sheeting.

Provide a drop cloth layer of plastic on floor in the Wash Room for every load-out operation. Roll this drop cloth layer of plastic from Wash Room into Work Area after each load-out. Provide a minimum of three (3) layers of plastic at all times. Use only clear plastic to cover floors.

Airlock: Provide an airlock between Wash Room and Holding Room. This is a transit area.

Separate access to this room from adjacent spaces by a sheet plastic flapped doorway.

Separate this room from the rest of the building and adjacent spaces with airtight walls fabricated of 1/2" plywood sheathing lined with six (6) mil polyethylene on interior surfaces. Provide 3 layers of clear six (6) mil poly on floor surfaces.

Holding Room: Provide Holding Room as a drop location for bagged asbestos-containing materials passed from the Wash Room. Construct Holding Room of nominal 2" x 4 wood framing and 1/2" plywood lined with 2 layers six (6) mil polyethylene and located so that bagged materials can be passed from the Wash Room through the Holding Room to the Clean Area.

Separate access to this room from the adjacent building area (Clean Area) by a plywood door with lockable hasp.

Decontamination Sequence: Take all equipment or material from the Work Area through the Equipment Decontamination Unit according to the following procedure:

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

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

Once inside the washroom, wet clean the bags and/or equipment. When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Holding Room and building area.

Workers from the building (non-contained side) enter Holding Area and remove decontaminated equipment and/or containers for disposal.

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

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

CONSTRUCTION OF THE DECONTAMINATION UNITS:

Walls and Ceiling: Construct airtight walls and ceiling using 1/2" plywood sheathing. Attach to a temporary framework of 2" x 4" studs any grade or species. Caulk all adjoining edges with silicone based caulking. (Siliconized caulking is unacceptable).

Interior Surfaces: Line interior surfaces with two layers of six (6) mil polyethylene. Any decontamination unit (waste or personnel) constructed in the Work Area shall have a load bearing capability of 100 pounds per square foot.

Floors: Use 3 layers (minimum) of six (6) mil polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.

Flap Doors: Fabricated from three (3) fully overlapping sheets with openings a minimum of three feet (3') wide. Configure so that sheeting overlaps adjacent surfaces. Weight sheets at bottoms as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') between entrance and exit of any room. Provide a minimum of three feet (3') between doors to airlocks.

Alternate methods of providing Decontamination facilities may be submitted to the Consultant for approval. Do not proceed with any such method(s) without authorization of the Consultant.

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

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CLEANING OF DECONTAMINATION UNITS:

Clean debris and residue from inside of Decontamination Units on a daily basis or as otherwise indicated in Contract Specifications. 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 plastic 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:

Provide signs in both English and Spanish.

LEGEND

DANGER

ASBESTOS

AUTHORIZED PERSONNEL ONLY

**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.

Post an approximately 10 inch by 14 inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

Provide signs in both English and Spanish.

LEGEND

NOTATION

NO FOOD, BEVERAGES OR TOBACCO PERMITTED

3/4" block

**ALL PERSONS SHALL DON PROTECTIVE
CLOTHING (COVERINGS) BEFORE
ENTERING THE WORK AREA**

3/4" block

**ALL PERSONS SHALL SHOWER IMMEDIATELY
AFTER LEAVING WORK AREA AND BEFORE
ENTERING THE CHANGING AREA**

3/4" block

END OF SECTION - 02050

SECTION 02081 - REMOVAL

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 2 Specification Sections, apply to work of this section.

RELATED WORK SPECIFIED ELSEWHERE:

Installation of Critical and Primary Barriers, and Work Area Isolation Procedures.

Project Decontamination procedures after removal of the Secondary Barrier are specified in Section 02090 Project Decontamination.

Disposal of asbestos-containing waste is specified in Section 02084 Disposal.

SUBMITTALS:

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

Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.

Removal Encapsulant: Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.

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. Also submit material safety data sheet for type of asbestos in materials being abated on this project.

PART 2 - 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.

Disposal Bags: Provide six (6) mil thick leak-tight polyethylene bags properly labeled as required by Section 02084 Disposal of Asbestos Containing Waste Material.

PART 3 - EXECUTION

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 to satisfaction of the Consultant, 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. Perforate outer covering of any insulation which has been painted and/or jacketed in order to allow penetration of amended water or removal encapsulant, or use injection equipment to wet material under the covering. 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.

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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, and do not allow ACM to drop to floor. As it is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over (gooseneck) and seal with minimum three wraps of duct tape. Clean outside and move to Wash Down Station adjacent to Material Decontamination Unit.

NOTE: Evacuate air from disposal bags with a HEPA filtered vacuum cleaner before sealing.

Restrict Access: Maintain existing access restrictions to areas with active electrical equipment. Allow access to area only to qualified tradespersons with prior experience in the installation and repair of involved equipment.

Personnel: 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.

Work Procedures: Perform removal work as per Sections 02040 and 02081.

END OF SECTION - 02081

SECTION 02084 - DISPOSAL

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-2 Specification Sections, apply to work of this section.

Section 01085 Codes and Regulations - Asbestos Abatement describes applicable federal, state and local regulations.

DESCRIPTION OF THE WORK:

This section describes the transfer of possession of asbestos contaminated and containing materials for disposal. Disposal includes packaging of asbestos containing waste materials. Disposal will be accomplished by landfilling. (As per NESHAPS Revision November 20, 1990)

SUBMITTALS:

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

Copy of state or local license for waste hauler.

Name and address of landfill where asbestos containing waste materials are to be buried.

Contact entity for transfer of possession of asbestos contaminated or asbestos containing waste materials.

Chain of Custody form and form of waste manifest proposed.

Sample of disposal bag and any added labels to be used.

Immediately following disposal submit copies of all manifests and disposal site receipts (2 Completed Forms) as follows:

- 1) Contractor will retain one copy.
- 2) Owner will retain one copy.

These copies must be submitted within 24 hours following disposal.

PART 2 - PRODUCTS:

Disposal Bags: Provide six (6) mil thick leak-tight polyethylene bags with pre-printed labeling as follows:

First Label: Provide 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 HAZARDOUS
SUBSTANCE,
SOLID, NOS,
ORM-E, NA 9188**

(ASBESTOS)

Third Label: Provide in accordance with NESHAPS revision final rule November 20, 1990 - location from which waste was generated and contractor's name and appropriate addresses.

NOTE: As of December 20, 1991, DOT Regulations concerning Hazardous Substances, Title 49, Parts 106, 107, and 171-180 Code of Federal Regulations has been revised. On October 2, 1992 new labeling requirements per DOT were required. The Contractor is responsible to abide by the most current regulation regarding proper labeling.

PART 3 - EXECUTION

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

Worker Protection - Asbestos Abatement
Respiratory Protection

GENERAL:

All workers will have donned clean disposable coveralls and at a minimum, half face, dual cartridge respirators before handling decontaminated disposal bags outside the work area. If a private waste hauler is used, the waste hauler must have all required licenses from all state and local authorities with jurisdiction. All disposal vehicles shall have asbestos warning signs (as per NESHAPS Revision November 20, 1990) during loading and unloading of ACM waste. Display the following Legend on each side of the disposal vehicle during loading and unloading of disposal waste.

LEGEND FOR DISPOSAL TRUCK

**DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY**

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

Load all asbestos containing waste material into 2 six (6) mil disposal bags (double bagged). All materials are to be contained in this manner and taken to a disposal truck.

At waste loadout, load ACM materials into a fully enclosed six (6) mil clear poly-lined enclosed truck or other appropriate vehicles for transport to the Landfill. Exercise care before and during transport, to ensure that no unauthorized persons have access to the ACM material.

Do not store double bagged materials outside of the Work Area. Take bags from the Work Area directly to a six (6) mil poly-lined enclosed truck.

At the Landfill unload double bagged waste:

One bag at a time and place into designated Landfill disposal area. Do not drop or throw bags. Do not introduce any damaged bags into the container(s).

Secure and retain receipts from landfill operator for materials disposed of. These receipts will be obtained from the Landfill Supervisor in charge of transfer.

Prior to Disposal, the Contractor shall:

Complete three copies of the Waste Manifest and Chain of Custody Forms.

At the landfill, prior to disposal, present one completed copy to the Landfill Operator.

After disposal, provide one completed copy of Waste Manifest and Chain of Custody to Building Owner with the original Landfill receipt.

Retain one copy of Waste manifest and Chain of Custody and Landfill receipt to Contractor for use in Project Closeout Submittals.

END OF SECTION - 02084

SECTION 02090 - PROJECT DECONTAMINATION

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-2 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK:

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

1. Primary and critical barriers erected by the work of Section 02030.
2. Pressure differential system installed by the work of Section 02040.
3. Decontamination unit erected by the work of Section 02050.

Work of this section includes the cleaning and decontamination of all surfaces of the Work Area, and all equipment in the Work Area.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION:

GENERAL:

Previous work: During completion of the asbestos abatement work specified in other sections, the secondary barrier of polyethylene sheeting will have been removed, and disposed of along with any gross debris generated by the asbestos abatement work.

Start of work: Work of this section begins with the cleaning of the primary barrier. At the start of work, the following will be in place:

Primary Barrier: One layer of four (4) mil polyethylene sheeting on walls.

Critical Barrier: Two layers of six (6) mil polyethylene sheeting over windows, doorways, floor drains, ventilation openings, equipment designated to remain, etc.

Physical Barriers: Any openings between the Work Area and the rest of the building or the outside, etc.

Decontamination Unit: In operating condition.

Pressure Differential System: In operation.

INITIAL CLEANING:

Carry out a cleaning of all surfaces in the Work Area including primary barriers on walls, equipment, piping, ductwork, etc.; exposed piping, electrical conduit, etc., by use of damp cleaning and mopping, and a High Efficiency Particulate Air (HEPA) filtered vacuum. 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.

VISUAL INSPECTION:

Upon receipt of Contractor's request for inspection, the Consultant shall perform a complete visual inspection of the entire Work Area including: decontamination units, all plastic sheeting, seals over access door openings, piping and conduit, and other openings, looking for debris from any sources, residue on surfaces, dust or other matter. If any such debris, residue, dust or other matter is found, the Contractor shall repeat cleaning and continue decontamination procedures from that point.

ENCAPSULATION:

Upon approval of the Consultant, the Contractor shall perform encapsulation of all surfaces within the Work Area barriers in accordance with Section 02100. Maintain pressure differential system in operation during encapsulation work.

Wait a minimum of four (4) hours to allow encapsulant to dry and pressure differential machines to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of Work Area(s) during this period. Maintain pressure differential system in operation for the entire period.

CLEARANCE AIR MONITORING:

WORK AREA CLEARANCE (If required):

After the Work Area is found to be visually clean, air samples will be taken and analyzed in accordance with the procedure set forth in Section 02110.

If clearance release criteria are not met, repeat initial cleaning, visual inspection, and encapsulation procedures and clearance air sampling procedures at the Contractor's expense until satisfactory levels are achieved.

COMPLETION OF ABATEMENT WORK:

Prior to removal of pressure differential machines from the Work Area(s), remove and properly dispose of all prefilters; primary and secondary and HEPA filters, damp clean units completely inside and out; and wrap in a minimum of two (2) layers of six (6) mil polyethylene sheeting, (with all joints, seams, and overlaps sealed with duct tape).

Decontaminate and remove the decontamination unit, waste loadout, PDM baffle enclosures, critical barriers, all equipment, materials, and debris from the Work Area(s).

Dispose of all HEPA filters from HEPA vacuums and respirators as ACM.

Fulfill project closeout requirements of Section 02120.

END OF SECTION - 02090

SECTION 02100 - LOCKDOWN ENCAPSULATION OF RESIDUAL ASBESTOS FIBERS
FOLLOWING ABATEMENT

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division - 2 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK:

The Extent of lockdown encapsulation work is shown on the drawings and as herein specified.

The work includes the sealing of all structural surfaces from which asbestos-containing have been removed with one (1) wet coat of lockdown encapsulant.

Lockdown encapsulant shall be made visible when dry through the use of a color identification lockdown encapsulant (blue in color).

SUBMITTALS:

Product Data: Submit manufacturer's technical information including label analysis and application instructions for each material proposed for use.

Installation Instructions: Submit manufacturer's installation instructions with specific project requirements noted.

Performance Warranty: Submit manufacturer's performance guarantee.

Certification: Submit written approval of entity installing the encapsulant from encapsulant manufacturer.

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 and encapsulating material proposed for use on the work. Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

DELIVERY AND STORAGE:

Deliver materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:

- Name or title of material
- Manufacturer's stock number and date of manufacture
- Manufacturer's name
- Thinning instructions
- Application instructions
- Acceleration instructions (if any)
- Coloring instructions

JOB CONDITIONS:

Apply lockdown encapsulating materials only when environmental conditions in the work area are as required by the manufacturer's instructions.

QUALITY ASSURANCE:

Installation of Spray-On Lockdown Encapsulation Materials: Install spray-on materials by a firm and personnel approved by the manufacturer of the primary materials.

Testing: Test material to be encapsulated using methods set forth in ASTM Proposed Specification P-189 "Specification for Encapsulants for Friable Asbestos Containing Building Materials".

PART 2 - PRODUCTS

Encapsulants: Provide lockdown encapsulants specifically designed for application to substrates involved in the scope of work (shall be U.L. Listed).

Draft Standards: Product shall be rated as acceptable for use intended when field tested in accordance with ASTM Proposed Specification P-189 "Specification for Encapsulants for Friable Asbestos Containing Building Materials".

Fire Safety: Use only materials that have a non-flammable rating, when dry (shall be U.L. Listed).

MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

Manufacturer: Subject to compliance with requirements, provide the following:

Lockdown Encapsulants:

SELECT APPROPRIATE ENCAPSULANTS FROM THOSE RATED AS "ACCEPTABLE" WHEN TESTED UNDER THE PROCEDURES OF: "BATTELLE COLUMBUS LABORATORIES' TESTS FOR THE EVALUATION OF ENCAPSULANTS FOR FRIABLE ASBESTOS-CONTAINING MATERIALS." AN UPDATED LIST IS MAINTAINED BY THE EPA.

PART 3 - EXECUTION

GENERAL:

Do Not Commence Application of lockdown encapsulating materials until all removal work within the work area has been completed and a visual inspection of the work area has been approved.

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.

STRUCTURAL SUBSTRATES AND ASSOCIATED SURFACES:

Apply one (1) coat of lockdown encapsulant to the substrates after all Asbestos-Containing Materials have been removed. Apply in strict accordance with the manufacturer's printed instructions for use of the lockdown encapsulant. Any deviations from such printed instructions must be approved by the Owner's Consultant in writing prior to commencing work.

Apply lockdown encapsulant with an airless spray gun with air pressure and nozzle orifice as recommended by the encapsulant manufacturer.

Apply the lockdown encapsulant while the substrate is still damp from the asbestos removal procedures. If the surface has been permitted to dry, vacuum surface with a HEPA filtered vacuum cleaner prior to spraying with the lockdown encapsulant.

Color the encapsulant so that visual confirmation of complete and uniform coverage is achieved. Adhere to manufacturer's instructions for coloring. At the completion of work the encapsulated surface must be a uniform color (blue).

END OF SECTION - 02100

SECTION 02110 - WORK AREA CLEARANCE

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.

DESCRIPTION OF WORK: (If required):

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

ANALYTICAL METHODS:

Phase Contrast Microscopy (PCM): Fibers on each filter will be analyzed using the OSHA Reference Method.

Transmission Electron Microscopy (TEM): Fibers on each filter will be measured using the AHERA Analysis Protocol (U.S. EPA 40 CFR Part 763, October 30, 1987) (if required).

CLEARANCE RELEASE CRITERIA:

The work for this project is complete when the Work Area is visually clean and airborne fiber concentrations for each of the samples collected within the Work Area do not exceed 0.010 fibers/cubic centimeters of air (f/cc) for PCM and 70 structures per square millimeter for TEM.

QUALITY ASSURANCE:

The services of a testing laboratory will be employed by the Owner to perform laboratory analysis of Clearance air samples.

PART 2 - PRODUCTS

SAMPLING CASSETTE:

PCM: Provide 25mm diameter sampling cassettes with conductive cowling and mixed cellulose ester (MCE) membranes. Cassettes will be factory loaded and manufactured by Millipore, Nucleopore, Environmental Monitoring Systems, or approved equal. Pore size shall be 0.8um.

TEM: Provide 25mm diameter sampling cassettes with conductive cowl and mixed cellulose ester (MCE) membranes. Cassettes will be factory loaded and manufactured by Millipore, Nucleopore, Environmental Monitoring Systems, or approved equal. Pore size shall be 0.45um.

SAMPLING PUMP:

Air sampling pumps shall be capable of creating a flow rate of 2.0 to 16.0 liters per minute, with flexible connecting tubing.

PART 3 - EXECUTION

GENERAL:

Pressure Differential System: The Pressure Differential System shall remain operational for the duration of sampling and until the Consultant instructs the Contractor that Clearance Release Criteria has been met.

Containment Barriers: Critical barriers on walls, floors, or ceilings shall remain in place during aggressive sampling and until the Clearance sampling and analysis has been completed and results meet Clearance criteria as specified under Section 2110 - ANALYTICAL METHODS.

Visual Inspection: Prior to aggressive Clearance procedures, the Work Area shall be inspected by the Consultant to ensure all asbestos has been removed, and the Work Area is visually clean.

Encapsulation Settling Period: Wait a sufficient amount of time so as to allow complete drying of encapsulation lockdown in the Work Area.

AGGRESSIVE AIR SAMPLING:

After the Area has passed a thorough visual inspection by the Consultant, aggressive sampling will be performed to dislodge any remaining dust. The Consultant will utilize the following methodology:

Prior to start of sampling pumps, the exhaust from forced air equipment (a leaf blower with at least a one horsepower rated electric motor) will be swept against all walls, ceilings, floors, ledges, and other surfaces of the Work Area. This procedure will be continued for five minutes per 10,000 cubic feet of room volume.

One 20-inch diameter fan per 10,000 cubic feet of room volume shall be mounted at a central location, approximately six (6) feet above the floor, directed toward the ceiling, and run continuously at low speed for the entire period of sample collection.

At the completion of air sampling, all samples shall be collected and pumps shall be shut off before the shutdown of the 20-inch fan(s).

Air samples shall be collected in areas subject to normal air circulation and away from room corners, obstructed locations, and sites near windows, doors, or vents.

SCHEDULE OF AIR SAMPLES:

The number of samples (TEM and PCM) collected shall be determined by the Owner and his Consultant based on removal area of this project

- * PCM - A minimum of five (5) PCM clearance samples shall be collected from each Work Area up to 25,000 square feet (per floor). An additional PCM sample shall be collected for each additional 5,000 square feet of area per Work Area.
- * TEM - A minimum of five (5) TEM clearance samples shall be collected for Work Area(s) up to 25,000 square feet. Five (5) TEM samples shall also be collected outside the Work Area(s) for possible Z Test comparison should Work Area samples fail. One (1) additional TEM sample shall be collected for each 5,000 square feet beyond the initial 25,000 square feet based on homogenous Work Area{s}. Include one (1) field blank from the Work Area, one (1) field blank from outside of the building, and one (1) sealed blank from the cassette lot utilized for this clearance.

Air volumes shall be sufficient enough so as to accurately determine fiber concentrations to 0.010 f/cc for PCM, or 0.005 s/cc for TEM. A minimum air volume of 1800 liters shall be collected for PCM (1,199 liters for TEM), and a maximum of 1800 liters for TEM analysis.

PCM and TEM samples shall be collected at a flow rate not to exceed ten (10) liters per minute.

RECLEANING:

If the airborne concentration of any of the Clearance air samples collected is above the Clearance level criteria specified in this Section, the decontamination is incomplete and it shall be required of the Contractor to reclean the Work Area. This will be followed by additional Clearance air sampling. The cost of resampling and analysis shall be borne by the Contractor.

END OF SECTION 02110