SECTION 01013 - SUMMARY OF THE WORK - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Notices and Permits

Job Site Notices & Permits

U.S. EPA 10 Day Notification
State of Delaware DNREC 10 Day Notification
Emergency Planning Procedures
Material Safety Data Sheets for Encapsulant, Glues, Etc.
Prevailing Wage Determination
Subcontractors List
Equal Employment Opportunity

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. **The Project** name is Asbestos Abatement / Decontamination at **Alexis I. DuPont Middle School** – BEA #767914B of the Red Clay Consolidated School District.

1. **Project Location:** Alexis I. DuPont Middle School, 3130 Kennett Pike, Wilmington, DE 19807

2. **Owner:** Red Clay Consolidated School District, 1798 Limestone Road, Wilmington, DE 19804

B. **Contract Documents**, dated April 9, 2015, were prepared for the Project by Batta Environmental Associates, Inc., Delaware Industrial Park, 6 Garfield Way, Newark, Delaware 19713. Conditions that are indicated on the Contract Documents include, but are not necessarily limited to the following:

1. Asbestos Abatement / Decontamination at **Alexis I. DuPont Middle School** – BEA # 767914B.

2. Any addenda to the Specification.

C. Work to be Performed Prior to Work Under this Contract:

- The building owner will remove all removable property from the designated work areas prior to use by the Contractor.
- Heating, cooling, and ventilating air systems into or out of the work area shall be shut down to prevent contamination and dispersal of asbestos fibers to other areas of the building.
- Electrical power shall be shut down, tagged, and locked out to all work areas, except those work areas where it is necessary that electrical equipment remain in service.

D. Work to be Performed Subsequent to Work Under This Contract: Upon completion of the asbestos removal and subsequent decontamination of the affected areas, asbestos contractor will ensure the work area(s) and surrounding area(s) are clear of any project equipment and will repair any damage incurred during the demolition/abatement process.

E. The Work consists of:

Base Bid:

Basement – Lower Level:

- ❑ Storage Room 107S – remove 60 linear feet of asbestos pipe insulation and 20 asbestos pipe fittings.
- ❑ Rooms 113 and 111C – remove 210 linear feet of asbestos pipe insulation, and 6 asbestos pipe fittings.
- ❑ Practice / Storage Rooms in Room 115 – demolish enough ceiling plaster to visually inspect space above plaster ceiling for asbestos pipe insulation.
- ❑ Bathrooms & Custodial Closets 132BT, 135GT, and 122J – demolish enough ceiling plaster to visually inspect space above plaster ceiling for asbestos pipe insulation.
- ❑ Hallway adjacent to Electrical Room 131 – remove 30 linear feet of asbestos pipe insulation above ducts.
- ❑ Basement Corridor 3 – remove 70 linear feet of asbestos pipe insulation.
- ❑ Rooms 119 and 119C – remove 220 linear feet of asbestos pipe insulation, and 4 asbestos pipe fittings.
- ❑ Rooms 117B, 119A, 119B, and 119C – demolish enough ceiling plaster to visually inspect space above plaster ceiling for asbestos pipe insulation.
- ❑ Room 121 – remove 160 linear feet of asbestos pipe insulation.
- ❑ Rooms 123 and 123A – remove 215 linear feet of asbestos pipe insulation, and 15 asbestos pipe fittings.
- ❑ Rooms 132, 132J, and adjacent Hallway – remove 75 linear feet of asbestos pipe insulation, and 20 asbestos pipe fittings.

First Floor:

- Room 202B – demo as needed 15 linear feet of (1'x1') duct to remove asbestos duct mastic on duct and on louver at VAV Box.
- Nurse's Bathroom 203T – remove 10 linear feet of asbestos pipe insulation above drop ceiling and demo wall plaster as needed to remove 20 linear feet of asbestos pipe insulation.
- Rooms 202C, 203, 204, 204A, First Floor Corridor 6, 205, 206, 207, 208, 210, 210A, 210B, 210C, 210D, – cut out louvers on VAV Boxes with asbestos containing caulk – 17 each / 120 linear feet.

Second Floor:

- Rooms 300, 301, 302, 303, 303A, 330A, 304, 304A, 305, 306, 307, 308, 310, 310A, and 312 – cut out louvers on VAV Boxes with asbestos containing caulk – 17 each / 120 linear feet.
- Auditorium Balcony 313 – Remove 26 seats from lowest row and remove 40 square feet of asbestos 9"x9" floor tile below the seats (mastic not included).

Exterior:

- Northeast Wing – remove window units with asbestos containing window glazing and asbestos containing caulk – 20 (3'x7') window units and 240 linear feet of caulk.
- Northeast Wing – remove window units with asbestos containing window caulk only – 8 (4'x6') window units and 125 linear feet of caulk and 16 (4'x7') window units with 185 linear feet of caulk.
- Gym Windows – remove window units with asbestos containing window glazing – 4 (10'x12') window units.
- Exterior Double Door Entry to Stair 2 – remove 20 linear feet of asbestos door caulk.
- Roof Area Northeast of Auditorium Stage Area – remove 12 linear feet of asbestos louver caulk.

Alternate Work:

Alternate 1:

- Practice / Storage Rooms in Room 115 – demolish and dispose of 550 square feet of ceiling plaster and remove approximately 200 linear feet of asbestos pipe insulation above the ceiling.

Alternate 2:

- Bathrooms & Custodial Closet 132BT, 135GT, and 122J – demolish and dispose of 350 square feet of ceiling plaster and remove approximately 140 linear feet of asbestos pipe insulation and 50 asbestos pipe fittings above the ceiling.

Alternate 3:

- Rooms 117B, 119A, 119B, and 119C – demolish and dispose of 200 square feet of ceiling plaster and remove approximately 110 linear feet of asbestos pipe insulation above the ceiling.

Alternate 4:

- Auditorium Balcony 313 – Remove 900 square feet of asbestos 9”x9” floor tile and carpet throughout Balcony Area (mastic not included).

Alternate 5:

- Southwest Wing – remove window units with asbestos containing Transite™ panels within the window system.
    - 10 (1’x6’) window units with 20 square feet of Transite™ panels.
    - 2 (2’x8’) window units with 8 square feet of Transite™ panels.
    - 4 (3’x5’) window units with 12 square feet of Transite™ panels.
    - 64 (3’x6’) window units with 250 square feet of Transite™ panels.
    - 1 (4’x6’) window unit with 8 square feet of Transite™ panels.
    - 10 (3’x7’) window units with 60 square feet of Transite™ panels.
    - 37 (3’x8’) window units with 215 square feet of Transite™ panels.
    - 3 (4’x8’) window units with 15 square feet of Transite™ panels.
    - 4 (3’x10’) window units with 25 square feet of Transite™ panels.

F. **The Work** will be constructed under a single prime contract. (note: re-insulation or re-installation are not part of this contract).

G. REMOVAL PROCEDURES

Work will not begin until a certified Project Monitor is on site. The Project Monitor must be on site at all times during asbestos abatement related activities. The contractor may not begin or continue work without a representative from a certified professional services firm present.

1. REMOVAL OF ASBESTOS CONTAINING MATERIALS

a) Install a **three stage decon**, equipped with **shower** at the **entrance** to each **containment** work area. The decon will be erected in such a manner as to allow for separate **equipment room/bag-out** off to the side or a two-staged **bag-out chamber** can be placed at a separate location other than the decon unit. In no instance will the personnel decon be used as a bag-out/equipment passage. Reference section **01563** in the Specification for specific requirements for **decontamination units**.

b) Set up **HEPA filtered air filtration devices**, (AFDs) in the work area(s) and have them running during pre-clean and prep stages. All **exhaust** from HEPA machines must be **vented outside** the building. **Plywood barriers** (3/4" minimum) will be used to **secure any ground level windows** where the flex duct from the HEPA machines exhausts. **Plywood** is to be **installed** in a **secure manner without damaging** the **window** or associated **trim materials**.

c) **Pre-clean** the work area(s) **prior** to **installing criticals** in position. For all work areas containing asbestos **pipe insulation, pipe fittings**, or **floor tile** install **two (2)** distinct layers of **6 mil polyethylene criticals**, on all exterior doorways, operable windows, HVAC registers, louvers, sinks, electric panels, mechanical equipment, and any other openings that lead outside the work area.

d) For all work areas containing **pipe insulation** or **pipe fittings**, construct **containment(s)** consisting of a minimum of **one (1) layer** of **6 mil polyethylene walls** and **ceiling** in the work area(s) and a **two (2) layered 6 mil polyethylene floor**. For the **floor tile** work area, construct a **containment** consisting of a minimum of **one (1) layer** of **6 mil polyethylene walls** and **ceiling**. For **alternate work** involving the **demolition** of **plaster ceilings, prep** the work area **below** the **ceiling** level completely prior to demolition, and **prep** the area **above** the **ceiling** after **demolition** of **ceiling**. For all **full containments** where possible, install a **Plexiglas viewing window** at least **18" by 18"** and approximately **5' from the ground** at a location where the **work area** can be **viewed** from **outside the containment**.

e) For work areas involving the **removal** of **duct mastic** at louvers on VAV Boxes or for **demolition** of **plaster** to **inspect** areas **above** the **ceiling, regulate** each work area with a **two (2) layered 6 mil polyethylene critical flap** with **red danger barrier tape** and **asbestos danger signs** at the entrance(s) to each work area and install a **single layered 6 mil polyethylene drop cloth beneath** the **area** where work will occur. For all **exterior work**, regulate the **work area(s)** with **red danger barrier tape** and **asbestos danger signs** around the **perimeter** of the work area at least **10 feet** from the building **perimeter** where possible. Install a single layered **6 mil polyethylene drop cloth** around the **perimeter** of the building at least **10 feet** out along edges where **exterior abatement work** is occurring.

f) All **personnel** working within **fully contained** or **regulated work area(s)** shall wear required Personal Protective Equipment (PPE) of **Powered Air Purifying Respirators** (PAPR) and two tyvek or equivalent **full body coveralls**.

g) Once each **contained** or **regulated work area** has been **inspected** and **approved** by the **owner's representative**, then **asbestos abatement** may **begin**.

h) The contractor shall follow **proper removal procedures** at all times in accordance with section **02081**. All asbestos containing materials shall be **continually wetted** with **amended water** during removal procedures. **Dry removal of asbestos will not be permitted.** All **asbestos materials** shall be regularly **cleaned** up and **stored** in **industry standard waste bags**, **drums**, or wrapped in **two (2) layers** of **6 mil polyethylene** or equivalent with **NESHAP labels** affixed to them. **Asbestos waste** shall be **double bagged** in **6 mil asbestos waste bags** or wrapped in **two (2) layers** of **6 mil polyethylene** or equivalent with **danger asbestos warnings** on the bags and **NESHAP labels** affixed to the bags after being sealed. **Asbestos** waste **material** must be **adequately wet** and the bags shall be **goose necked** and sealed with duct tape prior to being removed from the work area. **ACM waste** will be **bagged out** at the **end** of **each workday** and **stored** in a **lockable container**. Refer to section **02084**.

i) Remove all asbestos **pipe insulation** and **pipe fittings fittings** from the work area(s) until using proper **glovebag removal** techniques in accordance with Specification section **01529.** The owner's representative will **test** each **glovebag** with a **smoke tube** before removal occurs to **verify** the **effectiveness** of the **seal**. Each glovebag shall have a **water sprayer** with amended water and a **HEPA vacuum** hooked up before removal is authorized. All glovebag removal operations shall be performed with a **minimum of two (2) personnel** for each glovebag. **PPE** requirements for **glovebag removal** are **PAPR** and two tyvek or equivalent **full body coveralls**.

j) If the contractor opts to use **gross removal** techniques for removal or **pipe insulation** or **pipe fittings** then the **prep requirements** for the containment(s) are **two (2)** independent **layers of 6 mil polyethylene walls**, **floor**, and **ceiling** and a **two (2) layered 6 mil polyethylene drop cloth** to be installed at the beginning and removed at the end of each shift. **PPE** requirements for **gross removal** are **Type C, Grade D Supplied Air** and two tyvek or equivalent **full body coveralls**.

k) It will be necessary to **remove** non-asbestos **ceiling plaster** to access potential asbestos **pipe insulation** and **pipe fittings** in areas under **alternate work**. For the **initial inspection** phase **prep** the **work area** in accordance with **section (e)** and **demolish** enough **plaster** to **visibly inspect above** the **ceiling** for the presence of asbestos pipe insulation or pipe fittings. Once **asbestos insulated pipes** are **confirmed prep** the **area** in accordance with **section (d)** in the area of the room beneath the ceiling and **remove** the ceiling **plaster** while under **full containment prepping** the **areas above** the **ceiling** in accordance with section (d) **once** they become **accessible**. **Do not engage in** the **removal** of any **pipe insulation** or **pipe fittings** until the entire area **above** the **ceiling** is accessible and **prepped** in accordance with **section (d)**. **PPE** requirements for the **demolition of plaster** in both the **initial inspection** and **removal phases** are **PAPR** and two tyvek or equivalent **full body coveralls**.

l) In the **Auditorium Balcony, unscrew** the lowest row of **seats** from floor **under full containment**. Remove all asbestos **floor tile** from the floor substrate until **no visible debris** or **bulk residue** remains (floor tile mastic is non-asbestos containing). Refer to **Specification** section **02087**. **PPE** requirements for **floor tile removal** are **PAPR** and two tyvek or equivalent **full body coveralls**.

m) For **alternate work**, **remove carpet** under **full containment** as **asbestos contaminated waste** in accordance with section **02063** of the **Specification** if **floor tile adheres** to **carpet**. If **floor tile** does **not adhere** to **carpet** then carpet may be **disposed** of as **general construction waste**.

n) **Demolish duct work as needed** to **remove** asbestos containing **duct mastic**. All asbestos **duct mastic** shall be **sealed** with two **(2) layers of 6 mil polyethylene sheeting** and duct tape with **NESHAP labels** affixed **before** being **removed** from the **work area(s)**. **PPE** requirements for the **demolition of ducts** are **PAPR** and two tyvek or equivalent **full body coveralls**.

o) **Cover** the **louvers** on **VAV Boxes** with two **(2) layers of 6 mil polyethylene sheeting** and duct tape to **seal** the asbestos containing **duct mastic**. Cut around the louver to **remove** the **louver portion** of the **duct intact** and **dispose** of as **asbestos contaminated waste** with **NESHAP labels** affixed. **PPE** requirements for the **removal of louvers** are **PAPR** and two tyvek or equivalent **full body coveralls**.

p) **Windows** with asbestos **glazing** shall be **removed intact** and wrapped in **two (2) layers** of **6 mil polyethylene** or equivalent prior to being removed from the regulated work area. **Scrape** all asbestos **window/door/louver caulk** with **hand scrappers** down to the substrate with no bulk debris remaining. Refer to specification section **02061**. Mechanical **sanders** or **grinders** are **not to be used** for **removing** any **exterior asbestos materials**. For **alternate work** remove **Transite™ Panels** intact and wrap in **two (2) layers** of **6 mil polyethylene** or equivalent. **PPE** requirements for all **exterior work** are **PAPR** and two tyvek or equivalent **full body coveralls**.

q) For all **pipe insulation**, **pipe fitting**, **duct demolition**, or **floor tile** containments, after complete **removal** and **final cleaning** of all **asbestos containing materials** throughout the work area, the **owner's representative** and **contractor's supervisor** will **inspect** the work area. Once the **work area passes** a **visual inspection** and contains **no visible asbestos debris**, then **encapsulation** of the **work area** shall occur **prior** to running **final air tests**.

r) For all **VAV Box louvers**, and **exterior work areas**, after complete **removal** and **final cleaning** of all **asbestos containing materials** throughout the work area, the **owner's representative** and **contractor's supervisor** will **inspect** the work area. Once the **work area passes** a **visual inspection** and contains **no visible asbestos debris**, then **deregulation** of the **work area** shall occur.

s) **Final air tests** will be performed by the **owner's representative** using **AHERA, TEM** aggressive clearance sampling protocol. **Tear down** of the containment will not proceed until **final air tests** have **passed** and been **documented** by the **owner's representative**. For work areas with **less than 160 square feet** or **260 linear feet** of asbestos containing material, **AHERA, PCM** aggressive sampling protocol will be employed.

t) **Final air tests** will be **not** be **performed** for work area(s) that are in **exterior locations** or in areas where **demolition without** the **disturbance** of **ACM** occurs.

GENERAL REQUIREMENTS

• **DOCUMENTS AND INFORMATION REQUIRED ON SITE** – The following information MUST be on site in order for any prep or abatement activities occur: EPA 10 Day Notification, Supervisor and Worker Badges, Current Medical Clearance and Fit Test Records, Safety Procedures, Evacuation Plan, Emergency Phone Numbers, MSDS information, Worker Acknowledgement Certificates, and Equipment Certification.

• **BADGE REQUIREMENTS** - All workers must have a current State of Delaware Asbestos Supervisor or Worker Badge on site in order to work on this project – **no exceptions**.

• **MINIMUM WORK FORCE** – A minimum of three (3) personnel, including one (1) supervisor and two (2) workers or supervisors will be on site at ALL times when abatement related work under this specification is occurring, unless waived in writing by Facilities Management. Examples of exceptions to this are during mobilization and de-mobilization.

• **PPE FOR ALL REMOVAL ACTIVITIES** – Tyvek or equivalent coveralls/suits with pull over hoods & feet. For all **abatement activities** minimum **PPE** will be **Powered Air Purifying Respirators (PAPR)**. If **gross removal** procedures are used for **thermal systems insulation**, respiratory protection will be **Type C, Grade D Air Respiratory System.**

• **BACK-FLOW PROTECTION DEVICES** - Back-Flow Protection Devices are **required to be used each time** the contractor makes **temporary water connections or taps in to a public water system** (owner's water supply) to supply his work area, or decon shower (hot & cold) per section 01503 of Specification.

• **GROUND FAULT PROTECTION** - Contractor shall use **GFCI protection** on all **electrical connections** for this Project. The contractor may use a **temporary distribution panel** with GFCI breakers or outlets, or use **3-wire extension cord** with **GFCI t**o connect to existing electrical outlets in facility.

• **TOOLS & EQUIPMENT** - All tools & equipment must meet **OSHA standards** or must be removed from site.

• **ELECTRICAL LIGHTS, TOOLS & EQUIPMENT** -Electrical lights, and electrical tools and equipment in the work area shall be **water resistant** with **3-wires (or a double insulated piece of equipment with a manufacturer's OEM two prong cord if approved for use in damp locations)** and equipment in the work area shall be **grounded** and **utilize a GFCI**.

• **FIRE EXTINGUISHERS** - Contractor shall provide a minimum of one **fire extinguisher** for every **2,500 SF** of containment and one fire extinguisher outside the containment near the decon.

• **FIRST AID KIT** – Contractor shall provide a stocked **first aid kit** in accordance with **29 CFR 1926**.

• **DECONTAMINATION UNITS** - units will be constructed in accordance with **section 01563** of this specification.

• **DANGER SIGNS** -Proper **OSHA Danger signs** will be posted at all the **entrances** to the **regulated areas**.

• **DECONTAMINATION UNIT WASTE WATER** - will be disposed of in accordance with **section 01563.**

• **WASTE BAGS** - All **ACM waste bags** must be **double-bagged**, **goose necked**, **sealed with duct tape**, and affixed with **NESHAP labels** prior to placing in waste container. For materials to be disposed of as **Non-Friable** waste, **BOTH bags** must be **clear**. For all **other asbestos waste**, the **first** (interior) **bag** must be black, yellow, or other **solid color**, with the **second** (exterior) **bag** being **clear**. This will enable **verification** of the use of **two bags** without requiring opening of packaged waste.

• **STOP WORK ORDER** - If at any time the Contractor is found to not be in compliance with the guidelines of this specification then a **STOP WORK ORDER** will be issued. **Work** will **cease** until **corrective measures** are taken to **bring** the **work practices** back in **compliance** and work may not continue until **approval** is granted by the **Owner's Representative**.

• **FINAL AIR TEST RESULTS** – **TEM** clearance, analysis results will be achieved within **twenty-four (24) hours** from the time the samples are collected. **Aggressive air sampling** protocol will be employed. The **abatement contractor** will **supply leaf blowers** & **fans** for aggressive sampling.

• **LAND FILL & CHAIN OF CUSTODY** - The building owner directs the contractor to utilize an **EPA approved landfill** to **dispose** of the **asbestos waste**. The contractor is to provide the owner's representative with the **completed waste manifest / chain of custody** as well as the **landfill receipts**. **Transportation** and **disposal** of **asbestos waste** shall occur within **forty-five (45) days** of removal.

• **VEHICLES OR TRANSPORTATION CONTAINERS** – All **vehicles** or **transportation containers** used for transportation of **asbestos waste** (i.e. dumpsters) will be **lined** on the inside **sides** and the **floor** of the **waste area** with one **(1) layer of 6-mil plastic sheeting** to be **removed** and properly **disposed** of with the **load** of **asbestos waste**.

1.3 ASBESTOS-CONTAINING MATERIALS:

The Work of this contract involves activities that will disturb asbestos-containing materials (ACM). The location and type of ACM known to be present at the worksite is set forth in the Schedule of Asbestos-Containing Materials at the end of this section. If any other ACM or PACM is found, notify the Owner, or Owner's Representative about the location and quantity of the ACM or PACM within 24 hours of the discovery.

1.4 ASBESTOS HEALTH RISK:

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 ACM, take appropriate continuous measures as necessary to protect all building occupants from the risk 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.

1.5 CONTRACTOR USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the work is indicated.

1. **Owner Occupancy:** Allow for Owner occupancy and use by the public.

2. **Driveways and Entrances:** Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Use of the Existing Building: Maintain the existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1. Smoking: Smoking or open fires will not be permitted within the building enclosure or on the premises.

2. Toilet Rooms: Except for toilet rooms designated for use by the Contractor's personnel, use of existing toilets within the building by the Contractor's personnel will not be permitted.

1.6 OCCUPANCY REQUIREMENTS

A. Partial Owner Occupancy: The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. The Owner's Representative will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner occupancy.

1.7 AIR MONITORING BY THE OWNER:

A. The Owner has contracted for air monitoring. Air monitoring may be conducted both outside and inside of the work area during the work, and for clearance sampling at the end of the project.

1. Outside of the Work Area: The Owner's air monitoring firm may sample air outside of the work area to detect faults in the work area isolation such as:

a. Contamination of the building outside of the work area with airborne asbestos fibers,
b. Failure of filtration or rupture in the differential pressure system,
c. Contamination of air outside the building envelop with airborne asbestos fibers.

2. Inside the Work Area: The Owner’s air monitoring firm may monitor airborne fiber counts in the Work Area. The purpose of this air monitoring is to detect airborne asbestos concentrations that 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.

B. **Work area clearance:** Clearance air sampling by the Owner's air monitor at the completion of asbestos abatement work is described in Section 01711 Project Decontamination.

C. **Air monitoring** required by OSHA is the responsibility of the Contractor and is not covered in this section.

1.8 SCHEDULE OF AIR SAMPLES BY OWNER:

A. **Sample cassettes**: Samples will be collected on 25 mm. cassettes as follows:

1. **PCM:** 0.8 micrometer mixed cellulose ester.
2. **TEM:** 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter.

B. **Number and Volume of Samples:** The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner's Representative may vary depending upon job conditions and the analytical method used.

C. **Sample Volume and Sensitivity:**

1. **PCM:** The sample volumes collected by the Owner's air monitor will be determined by the following formula:

$$\frac{(\text{\# fibers in sample - \# fibers in blank})\ 385\text{mm}^2}{(\text{Vol Liters})(1000)(0.00785\text{mm}^2)(\text{\# fields})} = \text{fibers/cc}$$

Where: Number of fibers = Actual # of fibers observed/100 fields, with a minimum of 5.5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm^2 on the filter.

Area of 100 fields = $0.785mm^2$

Total Filter Area = $385mm^2$

Limit Value = as specified in the schedules of samples below.

a. For purposes of this specification, the sample volume calculated above will be considered to be of sufficient size so that there is a 95% level of confidence that the value measured by each individual sample at the limit of detection (LOD) is less than or equal to the limit values specified below.

b. For purposes of this specification, the Limit of Detection (LOD) is defined as 7 fibers/mm^2 on the filter or 5.5 fibers/100 fields.

c. For purposes of this specification overloaded samples will be considered as exceeding the applicable limit value.

2. **TEM:** Analytical Sensitivity of 0.05 structures/cc as set forth in the AHERA regulation.

D. **Base Line (pre-samples):**

1. **Before Start of Work:** The Owner will secure air samples to establish a base line.

2. **PCM Samples**

Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume (Liters)	Rate (Liters/Min)
Each Work Area	5	0.01	1,000	1-10
Outside Each Work Area	2	0.01	1,000	1-10

3. **TEM Samples:**

Location Sampled	Number of Samples	Analytical Sensitivity (Struct./cc.)	Approx. Volume (Liters)	Rate (Liters/Min)
Each Work Area	1	0.005	1,300	1-10
Outside Each Work Area	1	0.005	1,300	1-10

4. **Base Line:** a level expressed in fibers per cubic centimeter which is twenty-five percent greater than the largest of the following:

   a. Average of the PCM samples collected outside each Work Area

   b. Average of the PCM samples collected outside the building

   c. 0.01 fibers per cubic centimeter

5. **Samples collected for TEM analysis** will be held without analysis. These samples will be analyzed under the conditions and terms set forth in "Fibers Counted" and "Affect On Contract Sum".

E. Daily:

1. **From start of work** of Section 01526 Temporary Enclosures through the work of Section 01711 Project Decontamination, the Owner may take samples.

2. **Sample volume and sensitivity:** inside the work area may vary depending upon conditions in the work area. If samples are overloaded at the sample volume required for a limit value equal to the Stop Action Levels or Immediate Stop Action Levels given later in this section, the level is considered to have been exceeded.

3. **PCM Samples:**

Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume (Liters)	Rate (LPM)
Each Work Area	2	0.01	1,000	1-10
Outside Each Work Area at Critical Barrier	2	0.01	1,000	1-10
Clean Room	1	0.01	1,000	1-10
Equipment Decon	1	0.01	1,000	1-10
Outside Building	1	0.01	1,000	1-10
Output of Pressure Differential System	1	0.01	1,000	1-10

F. Additional samples may be taken at Owner's or Owner's Representative discretion. If airborne fiber counts exceed allowed limits additional samples may be taken as necessary to monitor fiber levels.

1.9 ANALYTICAL METHODS USED BY THE OWNER:

A. The following methods will be used by The Owner in analyzing filters used to collect air samples. Sampling rates may be varied from printed standards to allow for high volume sampling.
   1. Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.
   2. Transmission Electron Microscopy (TEM) will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A.

1.10 LABORATORY TESTING BY OWNER:

A. **The services of a testing laboratory** may be employed by the Owner to perform laboratory analyses of the air samples. A technician will be at the job site, and samples will be sent daily by carrier for next day delivery so that verbal reports on air samples can be obtained within 24 hours.

B. **A complete record** of all air monitoring and results will be furnished to the Owner's Representative, the Owner, and if requested, the Contractor.

C. **The Contractor will have access** to all air monitoring tests and results upon request.

D. **Written Reports:** of all air monitoring tests will be posted at the job site on a daily basis.

1.11 FIBERS AND STRUCTURES

A. **Fibers Counted:** The following procedure will be used to resolve any disputes regarding fiber types when a project has been stopped due to excessive airborne fiber counts.

1. **Large Fibers:** "Airborne Fibers" referred to above include all fibers regardless of composition as counted by phase contrast microscopy (PCM), unless additional analysis by transmission or scanning electron microscopy demonstrates to the satisfaction of the Designer that non-asbestos fibers are being counted. "Airborne Fibers" counted in samples analyzed by transmission electron microscopy shall be asbestos fibers, greater than 5 microns in length. For purposes of stop action levels, subsequent to analysis by electron microscopy, the number of "Airborne Fibers" shall be determined by multiplying the number of fibers, regardless of composition, counted by PCM by the proportion of fibers that are asbestos as determined by TEM (a number equal to, asbestos fibers counted, divided by all fibers counted in the electron microscopy analysis).

2. **Small Structures:** "Airborne Fibers" referred to above include asbestos structures (fibers, bundles, clusters or matrices) of any diameter and any length greater than 0.5 microns.

1.12 ADDITIONAL TESTING:

A. **The Contractor may conduct** air monitoring and laboratory testing. If he elects to do this, the cost of such air monitoring and laboratory testing shall be at no additional cost to the Owner.

1.13 PERSONAL MONITORING:

A. Owner will not perform air monitoring for the Contractor to meet Contractor's OSHA requirements for personal sampling or any other purpose.

1.14 MISCELLANEOUS PROVISIONS

A project checklist has been provided in Appendix C of the Facilities Management Environmental Emergency specification package. This checklist is not intended to take the place of any regulations, specifications or directions, but is supplied to assist the Contractor.

The following inspections must be performed during the project phases indicated.

1- Pre-cleaning : A visual inspection of all pre-cleaned surface areas must be **performed by the Contractor's supervisor and the Owner's representative simultaneously.** This inspection will occur prior to the installation of polyethylene covering of walls, floors, and other surfaces.

2- Post removal : A visual inspection of each work area must be performed following successful clearance air sampling and prior to commencing tear-down. **This inspection is to be performed by the Contractor's supervisor and the Owner's representative simultaneously.**

3- Substantial completion: After each project is complete, including any applicable demolition, re-insulation, or cleaning, a final inspection will be **performed by the Contractor's supervisor and the Owner's representative simultaneously** before turning the work area over to the Owner.

Ten-day notifications are required for EPA Region III as well as to the State of Delaware (DNREC). If due to the immediacy of an emergency it becomes necessary to perform work within the notification period, the Owner's Representative will contact the proper authorities to request a waiver of the ten day period. All Contractors, workers, and supervisors must be State of Delaware Certified. (See Section 01098).

All electric power shall be shut down, locked and tagged out in the work area that is possible. The Owner will supply temporary electrical source. Contractor is responsible for making proper electrical connections as well as to disconnect existing lighting fixtures. Protect each circuit with a Ground Fault Circuit Interrupter (GFCI) of proper size located in the temporary panel. Outlet type GFCI devices may be used when approved by the Owner's Representative. Temporary water service - Contractor will make connection to cold water supply and ensure proper back-flow protection. Hot water heater, if required, will be supplied by the Contractor (See Section 01503).

Contractor must ensure the integrity of the enclosure and decontamination facility. Inspection windows are required for each enclosure where feasible. (See Section 01526).

All workers must have their current State of Delaware Asbestos Worker Badge as well as a copy of their current medical in order to work at the project site (this includes set-up and tear down, no exceptions).

Contractor will provide extra, new respirators, disposable overalls, head covers, and footwear covers for use by authorized visitors. All decontamination procedures are to be strictly adhered with. A signed copy of the Certificate of Workers Acknowledgment must be obtained from each worker (See Section 01560).

Three stage personnel decontamination units are required for each contained work area. An equipment decontamination unit consisting of the following arrangement of rooms, Clean Room, Holding Room, Wash Room for the removal of equipment and material from the Work Area, is required. Personnel are not to enter or exit the Work Area through the Equipment Decontamination Unit (See Section 01563).

The Contractor is to provide a list of products he intends to use during this project (See Section 01601).

Substitutions for specified products will be considered if received within 3 weeks prior to beginning work affected by the substitution. Requests received less than 3 weeks before commencement of affected work may be considered or rejected at the discretion of the Owner's representative (See Section 01632).

Final Cleaning - before requesting inspection for Certification of Substantial Completion, the work area as well as any affected areas must be cleaned and in a condition suitable to the Building Owner or Owner's Representative (See Section 01712).

Areas designated as contaminated - after complete removal of asbestos-containing material, all affected surfaces shall be decontaminated using a combination of HEPA vacuum and wet cleaning techniques. All non-visible asbestos residue shall be encapsulated with a coating of American Coatings Corp. 22-P Penetrating Encapsulant or equivalent product applied in strict accordance with the manufacturer's directions. Before spraying encapsulant, check with Owner's Representative, do not indiscriminately spray all surfaces. (See Section 01712).

Work area clearance - Clearance air sampling will incorporate TEM air sampling techniques. The Contractor will encapsulate prior to running final clearance samples. An AHERA set of TEM samples (five inside, five outside, IWA Blank, OWA Blank, and Lab Blank) will be run after completion of a visual inspection and work area encapsulation. TEM analytical results will be available within 24 hours of sample collection or sooner if needed. In the event that any final clearance samples fail, the abatement contractor may be responsible for the cost associated with re-running those samples (Section 01711). If PCM clearance is used for smaller work areas (< 160 SF or 260 LF) the turnaround will be 4 hours from the time samples are collected (Section 01711).

All asbestos-containing material shall be wetted with amended water during abatement. **DRY REMOVAL OF ASBESTOS WILL NOT BE TOLERATED.** (Section 02081)

* All Asbestos waste must be disposed of at an EPA approved landfill, site to be approved by the building owner. The Contractor is to provide the Owner's Representative with the completed chain of custody as well as the landfill receipts (See Section 02084).

The work includes the removal of asbestos-containing materials according to the requirements of the following specification section sections in the sequence indicated:

General and Administrative Requirements are set forth in the following specification sections:
01013 Summary of the Work - Asbestos Abatement
01043 Project Coordination - Asbestos Abatement
01097 Reference Standards and Definitions - Asbestos Abatement
01601 Materials and Equipment - Asbestos Abatement
01632 Product Substitutions
01701 Project Closeout - Asbestos Abatement

Abatement Work requirements are set forth in the following specification sections, listed here according to the sequence of the work:

01098 Codes, Regulations and Standards - Asbestos Abatement: 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.

01503 Temporary Facilities - Asbestos Abatement: sets forth the support facilities needed such as electrical and plumbing connections for the decontamination unit.

01560 Worker Protection - Asbestos Abatement: describes the equipment and procedures for protecting workers against asbestos contamination and other workplace hazards except for respiratory protection.

01562 Respiratory Protection: sets forth the procedures and equipment required for adequate protection against inhalation of airborne asbestos fibers.

01563 Decontamination Units: explains the setup and operation of the personnel and material decontamination units.

Asbestos Removal Work Procedures are described in the following specification sections:

02063 Removal of Asbestos Contaminated Materials
02081 Removal of Asbestos-Containing Materials
02084 Disposal of Asbestos Containing Waste Material

Decontamination of the Work Area after completion of abatement work is described in the following sections:

01701 Project Closeout: details the closeout procedures to end the project once abatement work is complete including final paperwork requirements.

01711 Project Decontamination: describes the sequence of cleaning and decontamination procedure to be followed during removal of the sheet plastic barriers isolating a work area.

01712 Cleaning and Decontamination Procedures: sets forth procedures to be used on contaminated objects and rooms which are not part of an abatement work area.

PLAN OF ACTION:

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

- Fire
- Accident
- Power Failure
- Negative Air System Failure
- Supplied Air System Failure
- Pipes Break

INSPECTION:

Prior to commencement of work, inspect areas in which work will be performed. Prepare a listing of damage to structure, surfaces, and equipment or of surrounding properties that could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit to Owner's Representative prior to starting work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 STOP ACTION LEVELS:

A. Inside Work Area: Maintain an average airborne count in the work area of less than the Stop Action Level given below for the type of respiratory protection in use. If the fiber counts rise above this figure for any sample taken, revise work procedures to lower fiber counts. If the Time Weighted Average (TWA) fiber count for any work shift or 8 hour period exceeds the Stop Action Level, stop all work except corrective action, leave pressure differential and air circulation system in operation and notify the Owner's Representative. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized, in writing, by the Owner's Representative.

STOP ACTION LEVEL (f/cc)	IMMEDIATE STOP LEVEL (f/cc)	MINIMUM RESPIRATOR REQUIRED	PROTECTION FACTOR
0.5	2.5	PAPR	1,000
1.0	5.0	Supplied Air	1,000

1. If airborne fiber counts exceed Immediate Stop Level given above for type of respiratory protection in use for any period of time cease all work except corrective action. Notify Owner's Representative. Do not recommence work until fiber counts fall below Stop Action Level given above for the type of respiratory protection in use. After correcting cause of high fiber levels, do not recommence work for 24 hours unless otherwise authorized in writing by Owner's Representative.

B. Outside Work Area: If any air sample taken outside of the Work Area exceeds the base line established in Part 1 of this section, immediately and automatically stop all work except corrective action. The Owner's Representative will determine the source of the high reading and so notify the Contractor in writing.

1. If the high reading was the result of a failure of Work Area isolation measures initiate the following actions:

    a. Immediately erect new critical barriers as set forth in Section 01526 Temporary Enclosures to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor).
    b. Decontaminate the affected area in accordance with Section 01712 Cleaning & Decontamination Procedures.
    c. Require that respiratory protection as set forth in Section 01562 Respiratory Protection be worn in affected area until area is cleared for re-occupancy in accordance with Section 01711 Project Decontamination.
    d. Leave Critical Barriers in place until completion of work and insure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.
    e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a Shower Room and Changing Room as set forth in Section 01563 Decontamination Units at entry point to affected area.
    f. After Certification of Visual Inspection in the Work Area remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Section 01711 Project Decontamination.

2. If the high reading was the result of other causes initiate corrective action as determined by the Owner's Representative.

    a. Due to construction activities occurring outside the regulated work area there is likely to be high air sample counts outside the work area due to this work activity. Baseline samples should be used to establish a basis to determine what the background counts are during construction activity prior to the start of this project.

3.2 STOP WORK:

A. **If the Owner or Owner's Representative** presents a written stop work order, immediately and automatically conform to that stop work order, while maintaining temporary enclosures and pressure differential. After being presented with a stop work order, immediately initiate the following actions:

1. Cease all asbestos removal activities, or any other activities that disturbs ACM.
2. Repair any fallen, ripped or otherwise failed work area isolation measures.
3. Maintain in operation all work area isolation measures including those required by Sections 01526 Temporary Enclosures, 01513 Temporary Pressure Differential & Air Circulation System, 01563 Decontamination Units.
4. Maintain all worker protections including those required by Sections 01560 Worker Protection - Asbestos Abatement, and 01562 Respiratory Protection.
5. Fog the air in the work area with a mist of amended water to reduce airborne fiber levels.

Do not recommence work until authorized in writing by the Owner's Representative.

SCHEDULE OF ASBESTOS-CONTAINING MATERIALS

BASEMENT FLOOR

Material	Quantity	% Asbestos
Pipe Insulation	1,040 LF	25 % Chrysotile
Pipe Fittings	65 EA	10 % Chrysotile

FIRST FLOOR

Material	Quantity	% Asbestos
Pipe Insulation	30 LF	25 % Chrysotile
Ducts with asbestos Mastic	(1'x1') 15 LF	3 % Chrysotile
VAV Box Louvers with Asbestos Mastic	16 EA 115 LF	 10 % Chrysotile

SECOND FLOOR

Material	Quantity	% Asbestos
VAV Box Louvers with Asbestos Mastic	17 EA 120 LF	 10 % Chrysotile
Removal of Seats	26 EA	NA
9" x 9" Floor Tile	40 SF	3 % Chrysotile

EXTERIOR WORK

Material	Quantity	% Asbestos
Window Units with Asbestos Glazing & Asbestos Window Caulk	(3'x7') 20 EA 240 LF	NA 3 % Chrysotile 3-10 % Chrysotile
Window Units with Asbestos Window Caulk	(4'x6') 8 EA & (4'x7') 16 EA 310 LF	NA 3-10 % Chrysotile
Window Units with Asbestos Glazing	(10'x12') 4 EA	NA 2 % Chrysotile

EXTERIOR WORK - continued

Material	Quantity	% Asbestos
Door Caulk	20 LF	3 % Chrysotile
Louver Caulk	12 LF	5 % Chrysotile

ALTERNATE 1: ROOM 115 PRACTICE/STORAGE ROOMS

Material	Quantity	% Asbestos
Ceiling Plaster	550 SF	possibly contaminated
Pipe Insulation	200 LF	25 % Chrysotile

ALTERNATE 2: BATHROOMS & CUSTODIAL CLOSET 132BT, 135GT, & 122J

Material	Quantity	% Asbestos
Ceiling Plaster	350 SF	possibly contaminated
Pipe Insulation	140 LF	25 % Chrysotile
Pipe Fittings	50 EA	10 % Chrysotile

ALTERNATE 3: ROOMS 117B, 119A, 119B, & 119C

Material	Quantity	% Asbestos
Ceiling Plaster	200 SF	possibly contaminated
Pipe Insulation	110 LF	25 % Chrysotile

ALTERNATE 4: AUDITORIUM BALCONY 313

Material	Quantity	% Asbestos
Carpet	900 SF	possibly contaminated
9” x 9” Floor Tile	900 SF	3 % Chrysotile

ALTERNATE 5: SOUTHEAST WING EXTERIOR WINDOWS

Material	Quantity	% Asbestos
Window Units with Asbestos Transite™ Panels	(1’x6’) 10 EA 20 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(2’x8’) 4 EA 8 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(3’x5’) 4 EA 12 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(3’x6’) 64 EA 250 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(4’x6’) 1 EA 8 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(3’x7’) 10 EA 60 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(3’x8’) 37 EA 215 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(4’x8’) 3 EA 15 SF	NA TBD
Window Units with Asbestos Transite™ Panels	(3’x10’) 4 EA 25 SF	NA TBD

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All quantities listed in this section are approximate. Contractor is responsible for verifying the quantities prior to submitting their bid.

PROJECT SCHEDULE

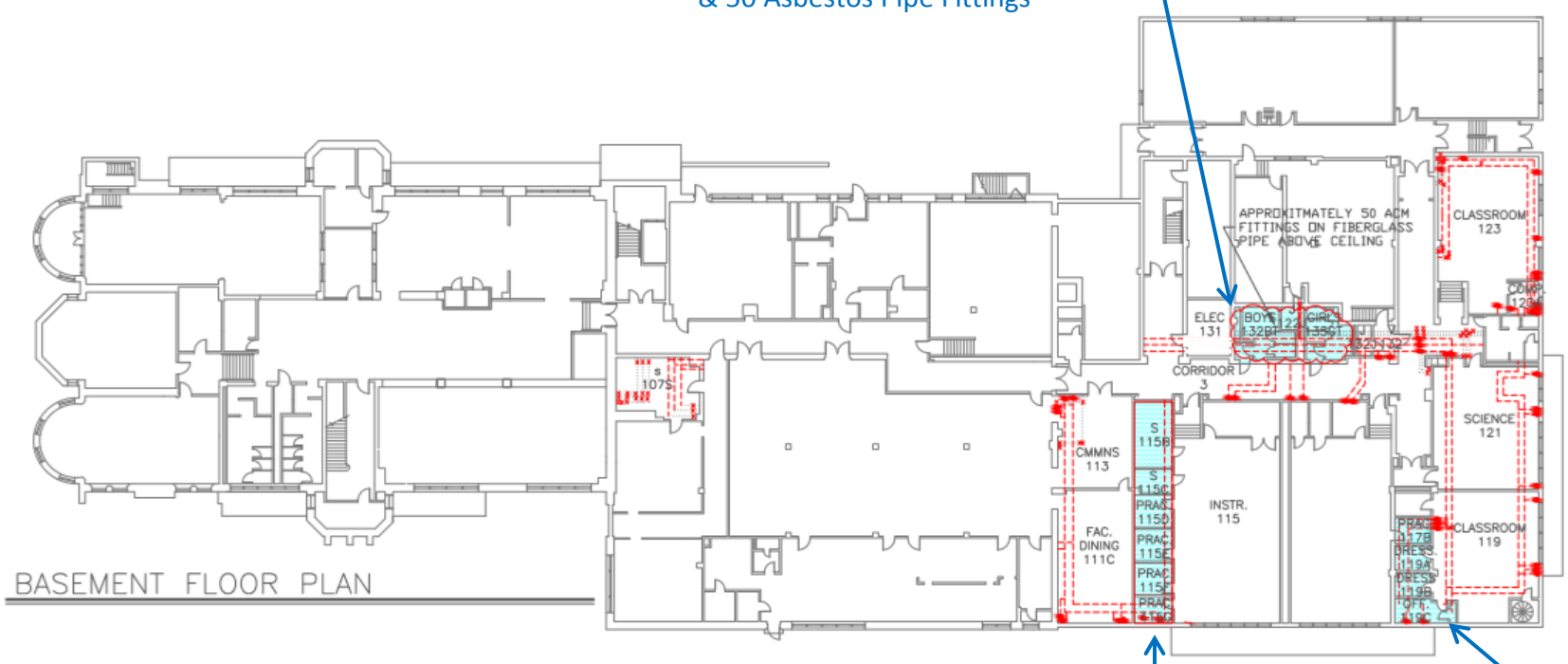
All interior work will commence on June 11th, 2015 and must be completed by July 31st, 2015.

All exterior work involving the removal of windows and window/door/louver caulk shall occur in two phases during the summers of 2015 and 2016 on a schedule to be announced and coordinated with window/door deliveries and reinstallation.

END OF SECTION 01013

APPENDIX A

PROJECT DRAWINGS



Remove Asbestos Containing Pipe Insulation – 1,040 LF

Remove Asbestos Containing Pipe Fittings – 65 EA

Alternate Work – Demolish 1,100 SF of Ceiling Plaster & Remove 450 LF of Asbestos Pipe Insulation & 50 Asbestos Pipe Fittings

Alternate 1: Demolish 550 SF Ceiling Plaster & Remove 200 LF of Asbestos Pipe Insulation

Alternate 3: Demolish 200 SF Ceiling Plaster & Remove 110 LF of Asbestos Pipe Insulation

NOT TO SCALE – FOR LOCATION REFERENCE ONLY – NOT FOR ESTIMATING

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- Indoor Air Quality
- Industrial Hygiene
- Env. Engineering

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Newark, DE
Delaware Industrial Park
6 Garfield Way
Newark, DE 19713
Phone: 302-737-3376
Fax: 302-737-5764

Georgetown, DE
Georgetown Professional Park
20169 Office Circle
Suite 112
Georgetown, DE 19947
Phone: 302-855-9341
Fax: 302-855-9342

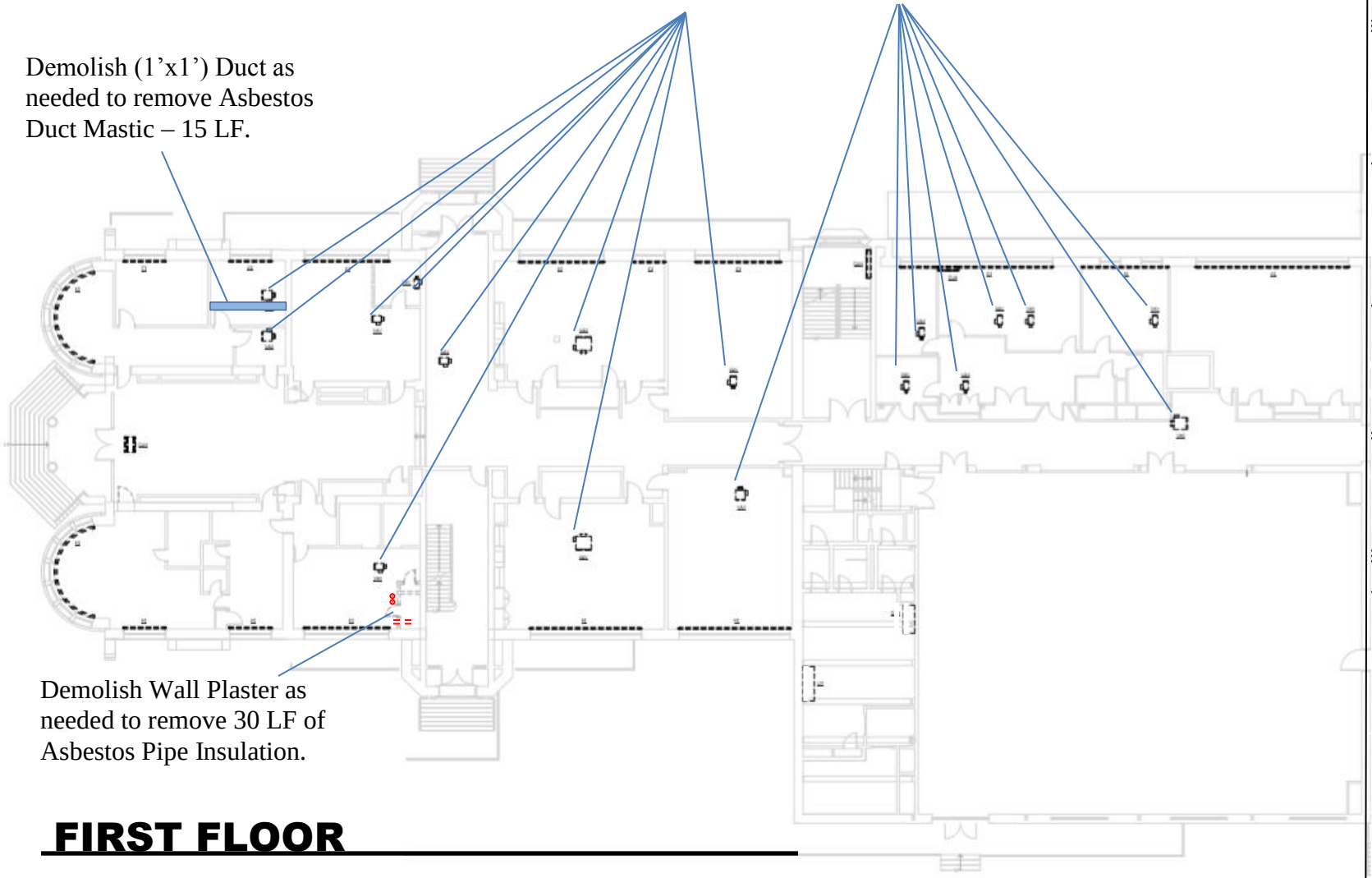
Philadelphia, PA
Two Penn Center Plaza,
Suite 200
Philadelphia, PA 19102-1706
Phone: 215-854-6349
Fax: 215-569-0216

Owings Mills, MD
10451 Mill Run Circle,
Suite 400
Owings Mills, Maryland 21117
Phone: 410-356-8849

PROJECT TITLE

Asbestos Abatement / Decontamination
Red Clay Consolidated School District
Alexis I. DuPont Middle School

DATE:	4/09/2015
PROJECT NO:	767914B
CAD DWG FILE:	767914B-1013
DRAWN BY:	SCW
CHECKED BY:	JMK
DWG NO.:	767914B-1
REVISION:	1
SCALE:	NTS



FIRST FLOOR

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Delaware Industrial Park
6 Garfield Way
Newark, DE 19713

Phone: 302-737-3376
Fax: 302-737-5764

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Georgetown Professional Park
20169 Office Circle
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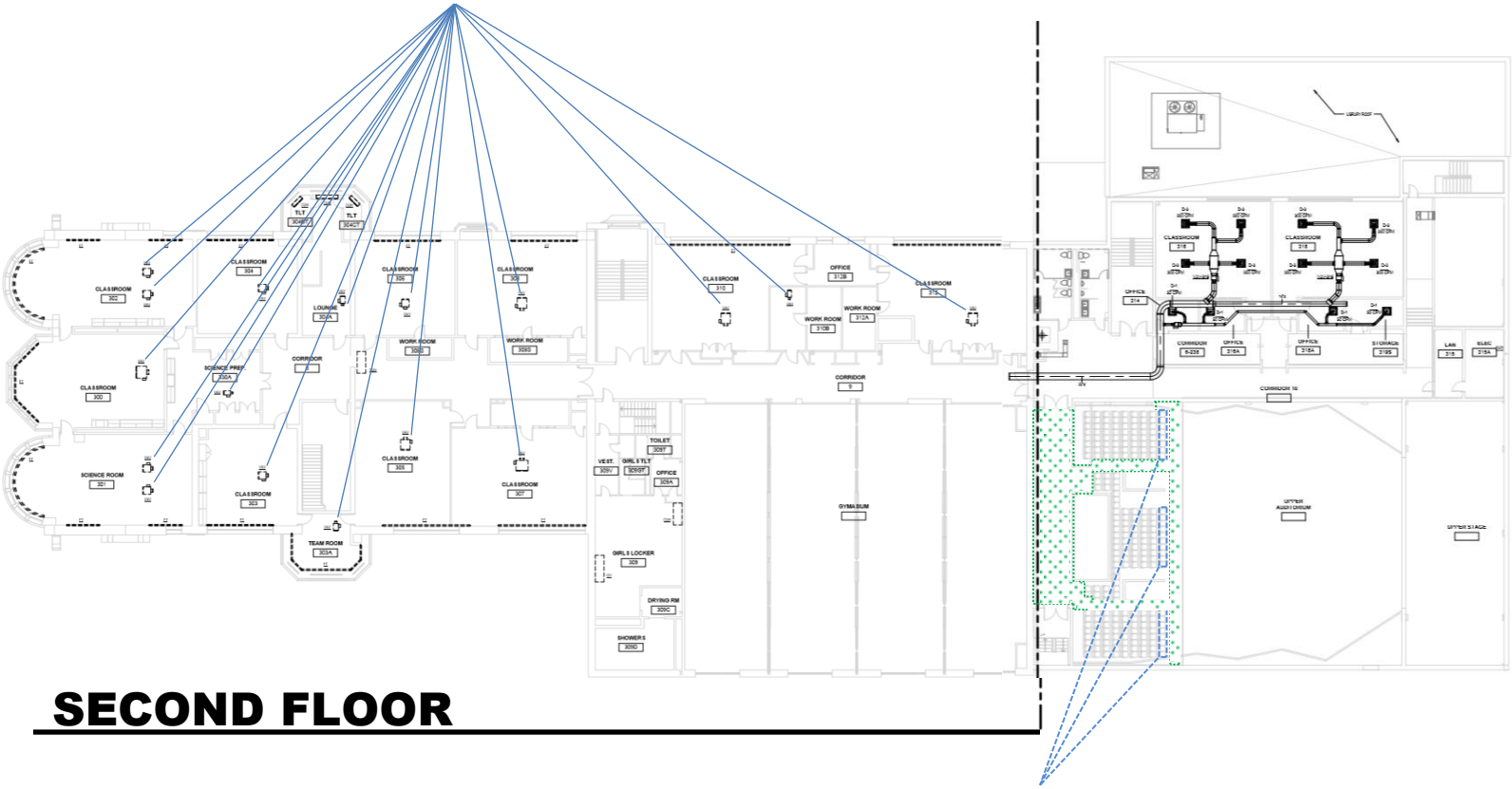
CHECKED BY:	JMK
DWG NO.:	767914B - 2
REVISION:	1
SCALE:	NTS

Remove Louvers from VAV Boxes – 17 Each, 120 LF of Asbestos Caulk



SECOND FLOOR

Base Bid: Remove 26 Seats and 40 SF of Asbestos 9”x9” Floor Tile.

Alternate #4: Remove 900 SF of Carpet and Asbestos 9”x9” Floor Tile.

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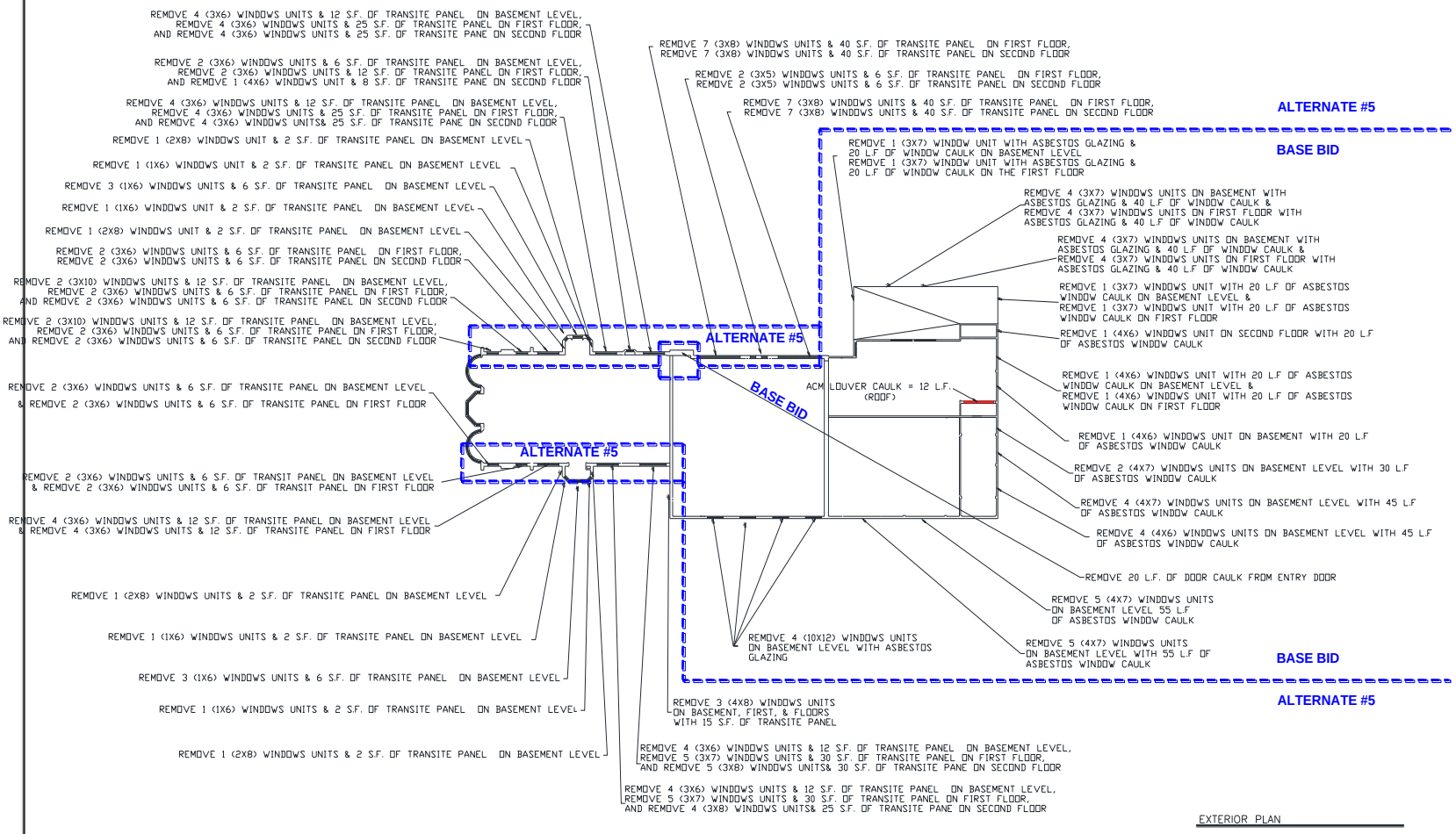
CHECKED BY:	JMK
DWG NO.:	767914B-3
REVISION:	1
SCALE:	NTS



EXTERIOR PLAN

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CHECKED BY:	
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REVISION:	
SCALE:	NTS

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

Asbestos Pipe Insulation – Storage Room 107S

Asbestos Pipe Fittings – Storage Room 107S

Asbestos Pipe Insulation – Room 111C

Asbestos Pipe Insulation – Room 119

Asbestos Duct Mastic – Room 202B

Louver Caulk on VAV Induction Box

Louver on VAV Induction Box – Nurses' Office - 203

Windows with Asbestos Glazing and Caulk – Northeast Wing

Windows with Asbestos Caulk – Northeast Side

Windows with possible Transite™ Panels – Alternate # 5 – Southwest Side

Asbestos Louver Caulk – Roof Area

SECTION 01028 - APPLICATIONS FOR PAYMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section specifies** administrative and procedural requirements governing the Contractor's Applications for Payment.

1. Coordinate the Schedule of Values and Application for Payment with the Contractor’s Construction Schedule, Submittal Schedule, and List of Subcontracts.

B. **Related Sections** - The following Sections contain requirements that relate to this Section.

1. **Contractor’s Construction Schedule:** The Contractor's Construction Schedule is specified in Division 1 Section "Coordination - Asbestos Abatement", section 01043.

2. **Submittal Schedule:** The Submittal Schedule is specified in Division 1 Section "Submittals", section 01301.

1.3 SCHEDULE OF VALUES

A. **Coordination:** Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
   a. Contractor's Construction Schedule.
   b. Application for Payment forms, including Continuation Sheets.
   c. List of subcontractors.
   d. Schedule of allowances.

e. Schedule of alternates.
f. List of products.
g. Schedule of submittals.

2. **Submit the Schedule of Values** to the Owner's Representative at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.

B. **Form:** Submit Schedule of Values on the form at the end of this section.

C. **Format and Content:** Submit a Schedule of Values that is based on functional, measurable, observable portions of the Work. Where appropriate breakdown the Work into phases, building areas or floors.

1. **Identification:** Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of the Owner's Representative.
c. Project number.
d. Contractor's name and address.
e. Date of submittal.

2. **Arrange the Schedule of Values** in tabular form with separate columns to indicate the following for each item listed:
a. Related Specification Sections or Divisions
b. Description of Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value.
1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Where appropriate, break principal subcontract amounts down into several line items.

4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.

5. **Unit-Cost Allowances:** Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

6. **Margins of Cost:** Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.

7. **Schedule Updating:** Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. **Each Application for Payment** shall be consistent with previous applications and payments as certified by the Owner's Representative and paid for by the Owner's Representative.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

B. **Payment-Application Times:** Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

If the agreement does not state payment dates, the following requirements will apply. The date for each progress payment is the 10th day of each month. The period covered by each application for payment starts on the day following the end of the preceding period.

C. **Payment-Application Forms:** Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment. Sample forms provided by the Owner's Representative for Applications for Payment are included at the end of this Section. If any forms other than those stated above are to be used, the required forms will be specified in the pre-bid meeting and supplied at that time.

D. **Application Preparation:** Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Owner's Representative will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. **Transmittal:** Submit 4 signed and notarized original copies of each Application for Payment to the Owner's Representative by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Owner's Representative.

F. **Waivers of Mechanics Lien:** With each Application for Payment, submit partial waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.

1. Submit partial waivers form each subcontractor, sub-subcontractor or supplier on each item provided by such an entity, for the amount requested, prior to deduction for retainage, on each item.

2. When an application shows completion of an item, submit final or full waivers from the subcontractors, sub-subcontractors and suppliers providing that item.

3. The Owner's Representative reserves the right to designate which entities involved in the work must submit waivers.

G. **Waiver Forms:** Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner's Representative, (4) four copies of each.

H. **Initial Application for Payment:** Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:

1. Submittals designated as required "Before Start of Work" by individual specification sections.
2. List of subcontractors.

3. List of principal suppliers and fabricators.
4. Schedule of Values.
5. Contractor's Construction Schedule (preliminary if not final).
6. Schedule of principal products.
7. Schedule of unit prices.
8. Submittal Schedule (preliminary if not final).
9. List of Contractor's staff assignments.
10. List of Contractor's principal consultants.
11. Copies of building permits.
12. Copies of authorizations and licenses from governing authorities for performance of the Work.
13. Initial progress report.
14. Report of preconstruction meeting.
15. Certificates of insurance and insurance policies.
16. Initial settlement survey and damage report, if required.

I. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

2. Administrative actions and submittals that shall precede or coincide with this application include:
a. Changeover information related to Owner's occupancy, use, operation, and maintenance.
b. Final cleaning
c. Application for reduction of retainage and consent of surety.
d. List of incomplete Work, recognized as exceptions to Owner's Representative's Certificate of Substantial Completion.

J. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required project records to the owner.
6. Proof that taxes, fees, and similar obligations were paid.
7. Removal of temporary facilities and services.
8. Removal of surplus materials, rubbish, and similar elements.
9. Change of door locks to Owner's access.

10. Disposal receipts, bills of lading and other required documentation of transportation and disposal of asbestos-containing waste.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

SCHEDULE OF VALUES

Project: _____ Date: _____
_____
_____

Contractor: _____ Contractor's: _____
_____ Rep: _____
_____ _____

Description	Related Work Sections	Amount
Preparation of Work Area	01503 Temporary Facilities - Asbestos Abatement 01513 Temporary Pressure Differential & Air Circulation System 01526 Temporary Enclosures 01563 Decontamination Units	_____
Site Demolition	02061 Building Component Demolition - Asbestos Abatement 02062 Non-Asbestos Demolition	_____
Asbestos Abatement	02063 Removal of Asbestos Contaminated Materials 02081 Removal of Asbestos-Containing Materials 02082 Removal of Asbestos-Contaminated Soil 02084 Disposal of Regulated Asbestos-Containing Material 02085 Resilient Floor Covering Manufacturers' Recommended Work Practices 02087 Resilient Flooring Removal - Asbestos Abatement 02088 Removal of Asbestos Roofing Materials 09251 Gypsum Drywall - Asbestos Enclosure 09805 Encapsulation of Asbestos-Containing Materials	_____

Project Decontamination	01711 Project Decontamination	
	01712 Cleaning & Decontamination Procedures	
	01713 Project Decontamination - Microfibers	_____
Other Work	01046 Cutting & Patching - Asbestos-Containing Materials	
	01527 Regulated Areas	
	01528 Entry Into Controlled Areas	
	01529 Mini Enclosures and Glovebags	
	15254 Repair of Insulation and Lagging	_____
Project Closeout	01701 Project Closeout-Asbestos Abatement	_____
	Total	_____

END OF SECTION 01028

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01043 - COORDINATION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section includes** administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1. Contingency Plan.
2. Notifications.
3. Pre-Construction Inspection.
4. Administrative and supervisory personnel.
5. Pre-Construction Conference
6. Progress Meetings
7. Record Keeping.
8. Special Reports.

B. **Related Sections:** The following Sections contain requirements that relate to this Section:

1. "Section 01301 - Submittals - Asbestos Abatement" for administrative procedures regarding submittals.
2. "Section 01601 - Materials and Equipment - Asbestos Abatement" for coordinating general installation.
3. "Section 01701 - Project Closeout - Asbestos Abatement" for coordinating contract closeout.

1.3 CONTINGENCY PLAN:

A. **Contingency Plan:** Prepare a contingency plan for emergencies or any other event that may require breaching of work area containment or modification or abridgement of decontamination or work area isolation procedures. Include in this

plan procedures for performing electrical and mechanical repairs inside containment after abatement work has begun. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Items to be addressed in the plan include, but are not limited to the following:

1. Fire
2. Accident
3. Life threatening injury
4. Non life threatening injury
5. Rescue
6. Power Failure
7. Pressure differential system failure
8. Breach of containment
9. Electrical faults or shock
10. Water leaks
11. Waste spills
12. Unauthorized entry into work area
13. Elevated air samples outside of containment
14. Repairs inside containment

1.4 NOTIFICATIONS

A. **Notify other entities** at the job site of the nature of the asbestos abatement activities, location of asbestos-containing materials (ACM), requirements relative to asbestos set forth in these specifications and applicable regulations. Advance notification will be made to:

1. Employees who will perform asbestos abatement work or related activities, or who will be in the work area during the course of the work of this contract.

2. Employers of employees who work and/or will be working in adjacent areas during the course of the work of this contract.

B. **Notify emergency service agencies** including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations,

modifications to fire notification or fire fighting equipment, and other information needed by agencies providing emergency services.

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

1.5 PRE-CONSTRUCTION INSPECTION:

A. **Inspect areas** in which work will be performed, prior to commencement of work. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit to Owner's Representative for record purposes prior to starting work.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. Project Supervisor/General Superintendent: Provide a full-time Project Supervisor/General Superintendent at the work site who is experienced in administration and supervision of asbestos abatement projects including work practices, protective measures for building and personnel, disposal procedures, project scheduling, management, etc. This person is the Contractor's Representative, and will function as the “competent person” at the work site responsible for compliance with all applicable federal, state and local regulations, particularly those relating to ACM.

1. Training/Accreditation: The General Superintendent must have a current certification from a State of Delaware approved trainer, contractor/supervisor for the State of Delaware asbestos supervisor’s course in asbestos abatement that meets the requirements of the EPA Model Accreditation Plan for asbestos abatement contractor/supervisor (40 CFR part 763, Subpart E, Appendix C).

2. Experience: The General Superintendent must have demonstrable experience in the successful management of asbestos abatement projects that are similar to the work of this contract, and have had a minimum of two (2) years on-the-job training in Asbestos Abatement and Procedures.

a. The General Superintendent must have a minimum of two (2) years’ experience in the on-site management of asbestos abatement projects.

b. The General Superintendent must have had responsible charge of a minimum of ten (10) asbestos abatement projects similar in size and type to the work of this contract.

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

1.7 PRE-CONSTRUCTION CONFERENCE:

A. **An initial progress meeting**, recognized as "Pre-Construction Conference" will be convened by the Owner's Representative prior to start of any work. The preconstruction conference will be scheduled before start of construction, at a time convenient to the Owner and the Owner's Representative. Meet at the project site, or as otherwise directed, with General Superintendent, Owner, Owner's Representative, Project Administrator, and other entities concerned with the asbestos abatement work.

B. **Attendees:** Authorized representatives of the Owner, Owner's Representative, and their consultants will be in attendance. An authorized representative of the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

1. 72 hours advance notice will be provided to all participants prior to convening Pre-Construction Conference.

C. **Agenda:** This is an organizational meeting, to review responsibilities and personnel assignments, to locate regulated areas and temporary facilities including power, light, water, etc. Items of significance that could affect progress will be discussed, including the following:

1. Tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders
5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data, and Samples.
8. Preparation of record documents.

9. Use of the premises.
10. Parking availability.
11. Office, work, and storage areas.
12. Equipment deliveries and priorities.
13. Safety procedures.
14. First aid.
15. Security.
16. Housekeeping.
17. Working hours.
18. Employee Training and Certification documents (each employee by name).
19. Employee Health Documentation
20. Work area design and layout plans (shown in accordance with specifications and drawings).
21. Equipment Certfication.
22. Rental Equipment Notfication.
23. NIOSH approval on respirators.
24. Documentation of respirator fit testing.
25. Periodic job progress reports format.
26. Filter change log format
27. Performance and Labor and Material Bonds
28. Certification of Insurance
29. Detailed work schedule and man power requirements.
30. Contingency planned for emergency actions.
31. Telephone numbers and connection of emergency services.
32. State of Delaware and EPA Ten (10) Day Notification.

1.8 PROGRESS MEETINGS:

A. General: In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, the Contractor's Representative will hold general progress meetings as required. These meetings will be scheduled weekly.

B. Attendees: Representatives of the Owner and Owner's Representative will attend this meetings. In addition to representatives of the Contractor, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work. Require each entity then

involved in planning, coordination or performance of work to be properly represented at each meeting.

1.9 RECORD KEEPING:

A. **Daily Log:** Maintain a Daily Log (in an area accessible to the Owner and Owner's Representative) as a sequential, hand-written record carefully prepared daily that documents but is not limited to the following items:

1. Meetings; purpose, attendees, brief discussion
2. Special or unusual events, i.e. barrier breeching, equipment failures, accidents
3. Documentation of Contractor's completion of the following:
a. Inspection of work area preparation prior to start of removal and daily thereafter.
b. Removal of any sheet plastic barriers
c. Inspections prior to spray back, lock back, encapsulation, enclosure or any other operation that will conceal the condition of ACM or the substrate from which such materials have been removed.
d. Removal of waste materials from work area
e. Decontamination of equipment (list items)
f. Final inspection/final air test analysis.

B. **Entry/Exit Log:** Maintain outside the Decontamination Unit a daily log documenting the dates and time of but not limited to, the following items:

1. Visitations; authorized and unauthorized with the following information
a. Name
b. Organization
c. Entry time
d. Exit Time
e. Respiratory protection

2. Personnel, by name, entering and leaving the work area with the following information
a. Printed Name
b. Identification Number
c. Entry Time
d. Exit Time
e. Respiratory Protection

C. **Air Monitoring Results:** Post personnel and area air monitoring results at Decontamination Unit within 24 hours of sample collection. Post the respiratory protection requirements for the work in progress.

D. **Records in Decontamination Unit:** Maintain the following documentation in the Decontamination Unit, in a location accessible to workers.

1. Documentation of inspections by OSHA, EPA or local authority
2. Respiratory Protection Program.

E. **Other records:** Maintain other documentation in a location that is accessible to the Owner and Owner's Representative including:

1. Waste Manifests and shipping records
2. Landfill receipts.
3. Accident reports.

F. Copies of this log will be submitted at final closeout of the project as a Project Closeout Submittal.

1.10SPECIAL REPORTS:

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

B. **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 report. List 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's Representative in advance at earliest possible date.

C. **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, or where work was stopped for over four hours during a scheduled shift.

D. **Report Discovered Conditions:** When an unusual condition of the building is discovered during the work (e.g. leaks, termites, corrosion) prepare and submit a special report indication condition discovered.

1.11SUBMITTALS

A. **Before the Start of Work:** Submit the following to the Owner's Representative in the same manner as product data. Do not begin work until these submittals are returned with "Owner's Representative's" action stamp indicating that all submittals have been received.

1. Plan of Action.
2. Contingency Plans.
3. Project Directory.
4. Notifications: copy of notification sent to other entities at the work site, and to emergency service agencies.
5. Pre-Construction Inspection: report on inspection carried out as required by this section
   (Include copies of all photographs, videotapes, etc).
6. Contractor's Construction Schedule.
7. Accreditation: Submit evidence in the form of Delaware training course certificates for the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors in accordance with AHERA requirements. Submit evidence in the form of Delaware training course certificates that each worker is trained as an asbestos abatement worker in accordance with AHERA requirements.
8. Resume: Submit resume of General Superintendent.

B. **Submit daily**: Provide two (2) copies for information purposes of all documents indicated in the following sub- sections to Project Administrator by end of the next working day after the day they are received by Contractor.

1. Section on Record Keeping.
2. Section on Special Reports.

C. **Project Closeout**: Submit two (2) copies for information purposes of all documents indicated in the following sections at final closeout of project as a project closeout submittal.

1. Section on Record Keeping.
2. Section on Special Reports.

PART 2 – PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION - 01043

SECTION 01046 - CUTTING AND PATCHING - ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Procedures for building small containment areas are specified in Section 01529 Mini Enclosures and Glovebags

B. Procedures for sealing exposed edges are specified in Section 09805 Encapsulation of Asbestos-Containing Materials

C. Procedures for disposal of waste are specified in Section 02084 Disposal of Regulated Asbestos Containing Materials

1.3 SUBMITTALS

A. **Before the Start of Work:** Submit Product Data Sheets for the following to the Owner's Representative for review. Begin no work until these submittals are returned with Owner's Representative's action stamp indicating that the submittal is “Received-Not Reviewed.”

1. Tools: equipped with HEPA vacuum dust collection attachments

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Provide local exhaust ventilation systems that comply with ANSI Z9.2

2.2 PRODUCTS

A. Products for encapsulation are specified in Section 09805.

PART 3 - EXECUTION

3.1 WORK PRACTICES

A. Before beginning work of this section, comply with:

1. Section 01527 - Regulated Areas
2. Section 01560 - Worker Protection - Asbestos Abatement
3. Section 01561 - Worker Protection - Repair & Maintenance
4. Section 01562 - Respiratory Protection

B. Perform cutting, drilling, abrading, or otherwise penetrating any asbestos-containing material in a manner that will minimize the dispersal of asbestos fibers into the air.

C. Provide adequate local exhaust to capture fibers produced by cutting, drilling, or abrading by means of an approved High Efficiency Particulate Absolute (HEPA) filter vacuum. Use specialized equipment such as drills or saws having integral ventilation hoods, which are connected, to a HEPA vacuum with a flexible hose. Handle and dispose of HEPA filters as contaminated material in accordance with requirements of Section 02084 Disposal of Regulated Asbestos-Containing Materials.

D. Thoroughly saturate absorbent surfaces of asbestos-containing material to be penetrated with a penetrating type encapsulate. Allow encapsulate to penetrate to substrate before working on materials.

E. Seal edges of asbestos-containing material exposed by cutting, drilling, or abrading, etc. with two (2) coats of an approved penetrating encapsulate applied in accordance with manufacturers' printed instruction for use of the encapsulate as an asbestos coating and requirements of Section 09805.

END OF SECTION - 01046

SECTION 01097-REFERENCE STANDARDS AND DEFINITIONS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Drawings must be recognized as diagrammatic in nature and **not completely descriptive** of the requirement indicated thereon."

1.2 DEFINITIONS

A. **General:** Basic contract definitions are included in the Conditions of the Contract.

1. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.

2. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Designer, requested by the Designer, and similar phrases.

3. "Approved": The term "approved," when used in conjunction with the Designer's action on the Contractor's submittals, applications, and requests, is limited to the Designer's duties and responsibilities as stated in the Conditions of the Contract.

4. "Regulations": The term "regulations" includes laws, ordinances, statutes, 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.

5. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.

6. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

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

8. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

a. 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, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.

b. Trades: Using terms such as "carpentry" does not 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 trades persons of the corresponding generic name.

c. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

1) This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

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

10. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

11. "Owner's Representative": This is the entity described as the "Architect" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." All references to Architect or Engineer in the Contract Documents in all cases refer to the Owner's Representative. The Owner's Representative will represent the Owner during construction and until final payment is due. The Owner's Representative will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Owner's Representative.

12. "Project Administrator": This is the entity described as the "Project Representative" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." The Project Administrator is a full time representative of the Owner at the job site with authority to stop the work upon written or verbal order if requirements of the Contract Documents are not met, or if in the sole judgement of the Project Administrator, Owner's Representative, or Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.

13. "Stop Work Order": is a written order to cease asbestos removal, encapsulation or enclosure activities. The Contractor must maintain work area enclosure, pressure differential isolation and ventilation of the work area, and decontamination units during the period that a Stop Work Order is in affect.

14. "General Superintendent": This is the Contractor's Representative at the work site. This person must be a Competent Person as defined by OSHA in 29 CFR 1926.

B. Definitions Relative to Asbestos Abatement:

1. "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).

2. "Adequately Wet:" Sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.

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

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

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

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

7. "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.

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

9. "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.

10. "Asbestos-Containing Waste Material:" Any material which is or is suspected of being or any material contaminated with an asbestos-containing material which is to be removed from a work area for disposal.

11. "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.

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

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

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

15. "Category I Non-friable Asbestos-containing Material (ACM):" Asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified; in appendix A, subpart F, 40 CFR part 763, section 1. Polarized Light Microscopy (PLM).

16. "Category II Non-friable ACM:" Any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the method stated in Category I that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.

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

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

19. "Cutting:" To penetrate with a sharp-edged instrument and includes sawing, but does not include shearing, slicing, or punching.

20. "Demolition:" The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

21. "Disposal Bag:" A properly labeled 6 mil thick leak-tight plastic bag used for transporting asbestos waste from work and to disposal site.

22. "Emergency Renovation Operation:" A renovation operation that was not planned but results from a sudden, unexpected event that, if not immediately attended to, presents a safety or public health hazard, is necessary to protect equipment from damage, or is necessary to avoid imposing an unreasonable financial burden. This term includes operations necessitated by non-routine failures of equipment.

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

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

25. "Penetrating encapsulant:" an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer. A penetrating encapsulant specifically designed to minimize fiber release during removal of asbestos-containing materials rather that for in situ encapsulation.

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

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

28. "Fabricating:" Any processing (e.g., cutting, sawing, drilling) of a manufactured product that contains commercial asbestos, with the exception of processing at temporary sites (field fabricating) for the construction or restoration of facilities. In the case of friction products, fabricating includes bonding, debonding, grinding, sawing, drilling, or other similar operations performed as part of fabricating.

29. "Facility:" Any institutional, commercial, public, industrial, or residential structure, installation, or building (including any structure, installation, or building containing condominiums or individual dwelling units operated as a residential cooperative, but excluding residential buildings having four or fewer dwelling units); any ship; and any active or inactive waste disposal site. For purposes of this definition, any building structure, or installation that contains a loft used as a dwelling is not considered a residential structure, installation, or building. Any structure, installation or building that was previously subject to this subpart is not excluded, regardless of its current use or function.

30. "Facility Component:" Any part of a facility including equipment.

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

32. "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, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. If the asbestos content is less than 10 percent as determined by a method other than point counting by polarized light microscopy (PLM), verify the asbestos content by point counting using PLM.

33. "Fugitive Source:" Any source of emissions not controlled by an air pollution control device.

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

35. "Grinding:" To reduce to powder or small fragments and includes mechanical chipping or drilling.

36. "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.

37. "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.

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

39. "In Poor Condition:" Means the binding of the material is losing its integrity as indicated by peeling, cracking, or crumbling of the material.

40. "Installation:" Any building or structure or any group of buildings or structures at a single demolition or renovation site that are under the control of the same owner or operator (or owner or operator under common control).

41. "Leak-tight:" Means that solids or liquids cannot escape or spill out. It also means dust-tight.

42. "Malfunction:" Any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner so that emissions of asbestos are increased. Failures of equipment shall not be considered malfunctions if they are caused in any way by poor maintenance, careless operation, or any other preventable upset conditions, equipment breakdown, or process failure.

43. "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.

44. "Non-friable Asbestos-containing Material:" Any material containing more than 1 percent asbestos as determined using the method specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

45. "Nonscheduled Renovation Operation:" A renovation operation necessitated by the routine failure of equipment, which is expected to occur within a given period based on past operating experience, but for which an exact date cannot be predicted.

46. "Outside Air:" The air outside buildings and structures, including, but not limited to, the air under a bridge or in an open air ferry dock.

47. "Owner or Operator of a Demolition or Renovation Activity:" Any person who owns, leases, operates, controls, or supervises the facility being demolished or renovated or any person who owns, leases, operates, controls, or supervises the demolition or renovation operation, or both.

48. "Particulate Asbestos Material:" Finely divided particles of asbestos or material containing asbestos.

49. "Planned Renovation Operations:" A renovation operation, or a number of such operations, in which some RACM will be removed or stripped within a given period of time and that can be predicted. Individual nonscheduled operations are included if a number of such operations can be predicted to occur during a given period of time based on operating experience.

50. "Regulated Asbestos-containing Material (RACM):" Means (a) Friable asbestos material. (b) Category I non-friable ACM that has become friable. (c) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading. or (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operation.

51. "Remove:" To take out RACM or facility components that contain or are covered with RACM from any facility.

52. "Renovation:" Altering a facility or one or more facility components in any way, including the stripping or removal of RACM from a facility component. Operations in which load-supporting structural members are wrecked or taken out are demolitions.

53. "Resilient Floor Covering:" Asbestos-containing floor tile, including asphalt and vinyl floor tile, and sheet vinyl floor covering containing more than 1 percent asbestos as determined using polarized light microscopy according to the method specified in appendix A, subpart F, 40 CFR part 763, Section 1, Polarized Light Microscopy.

54. "Strip:" To take off RACM from any part of a facility or facility components.

55. "Visible Emissions:" Any emissions, which are visually detectable without the aid of instruments, coming from RACM or asbestos- containing waste material, or from any asbestos milling, manufacturing, or fabricating operation. This does not include condensed, uncombined water vapor.

56. "Waste Shipment Record:" The shipping document, required to be originated and signed by the waste generator, used to track and substantiate the disposition of asbestos-containing waste material.

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

58. "Local Exhaust System:" A local exhaust system, utilizing HEPA filtration capable of maintaining a air flow through 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.

59. "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.

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

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

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

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

64. "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.

65. "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.

66. "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.

67. "Working Day:" Defined to include holidays falling on Monday through Friday.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

This Article is provided to help the user of these Specifications understand the format, language, implied requirements, and similar conventions. None of the explanations shall be interpreted to modify the substance of Contract requirements.

A. Specification Content: This Specification has been produced employing conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Language used in the Specifications and other Contract Documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the full context of the Contract Documents so indicates.

2. Imperative Language is used generally in the Specifications. Requirements expressed imperatively are to be performed by the Contractor. At certain locations in the text, for clarity, subjective language is used to describe responsibilities which must be fulfilled indirectly by the Contractor, or by others when so noted.

B. 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.

1. 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.

C. 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.

1.4 INDUSTRY STANDARDS

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

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

2. 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.

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

C. Updated Standards: At the request of the Owner's Representative, 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 Documents and before performance of Work affected. The Owner's Representative will decide whether to issue a Change Order to proceed with the updated standard.

D. 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 Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Owner's Representative for a decision before proceeding.

1. 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's Representative for decision before proceeding.

E. 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 Documents.

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

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

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations as referenced in Contract Documents 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 Documents:

ACGIH American Conference of Governmental Industrial Hygienists
1330 Kemper Meadow Drive
Cincinnati, OH 45240
(513) 742-2020

AIHA American Industrial Hygiene Association
2700 Prosperity Avenue, Suite 250
Fairfax, VA 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
11 West 42nd Street, 13th floor
New York, NY 10036

(212) 642-4900

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
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959
(610) 832-9585

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
FM	Factory Mutual Systems 1151 Boston-Providence Turnpike P.O. Box 9102 Norwood, MA 02062 (617) 762-4300
FS	Federal Specification (General Services Administration) Obtain from your Regional GSA Office, or purchase from GSA Specifications Unit 7th and D Streets, S.W. (WFSIS) Washington, DC 20406 (202) 472-2205 or 2140
GA	Gypsum Association 810 First Street, NE, Suite 510 Washington, D.C. 20002 (202) 289-5440
GSA	General Services Administration F St. and 18th St., NW Washington, DC 20405 (202) 655-4000
IEEE	Institute of Electrical and Electroniic Engineers 345 E. 47th Street New York, NY 10017 (212) 705-7900
IETA	International Electrical Testing Assoc. P.O. Box 687 Morrison, CO 80465 (303) 697-8441

IRI	Industrial Risk Insurers P.O. Box 5010 85 Woodland Street Hartford, CT 06102-5010 (203) 520-7300
ISA	Instrument Society of America P.O. Box 12277 67 Alexander Drive Research Triangle Park, NC 27709 (919) 549-8411
MIL	Military Standardization Documents (U.S. Dept. of Defense) Naval Publications and Forms Center 5801 Tabor Ave. Philadelphia, PA 19120
NBS	National Bureau of Standards (U.S. Dept. of Commerce) Gaithersburg, MD 20234 (301) 921-1000
NEC	National Electrical Code (by NFPA)
NECA	National Electrical Contractors Assoc. 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814 (301) 657-3110
NEMA	National Electrical Manufacturers Assoc. 2101 L St., NW, Suite 300 Washington, D.C. 20037 (202) 457-8400
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 (617) 770-3000
NRCA	National Roofing Contractors Association 10255 W. Higgins Road, Suite 600 Rosemont, IL 60018-5607

(708) 299-9070

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

RFCI Resilient Floor Coverings Institute
966 Hungerford Drive, Suite 12-B
Rockville, MD 20805
(301) 340-8580

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

WLA White Lung Association
P.O. Box 1483
Baltimore, MD 21203

G. **Federal Government Agencies**: Names and titles of federal government standard – or Specification – producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard – or Specification – producing agencies of the federal government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

1. CE Corps of Engineers
(U.S. Department of the Army)
Chief of Engineers – Referral
Washington, D.C. 20314
(202) 272-0660

2. CFR Code of Federal Regulations
(Available from the Government Printing Office)
N. Capitol St. between G and H St., NW

Washington, D.C. 20402 (202) 783-3238
(Material is usually first published in the "Federal Register")

3. CPSC Consumer Product Safety Commission
5401 Westbard Avenue
Bethesda, MD 20207
(800) 638-2772

4. CS Commercial Standard
(U.S. Department of Commerce)
Government Printing Office
Washington, D.C. 20402
(202) 783-3238

5. Del-DOT Delaware Department of Transportation
Highway Administration Building
800 Bay Road
Dover, DE 19901

6. DNREC Dept. of Natural Resources & Environmental Control
P.O. Box 1401
89 Kings Highway
Dover, DE 19903
(800) 662-8802

7. DOC Department of Commerce
14th St. and Constitution Ave., NW
Washington, D.C. 20230
(202) 482-2000

8. DOT Department of Transportation
400 Seventh St., SW
Washington, D.C. 20590
(202) 366-4000

9. EPA Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460
(202) 260-2090

10. FS Federal Specification (from GSA)
Specifications Unit (WFSIS)
7Tth & D. Sts., SW
Washington, D.C. 20407

(202) 708-9205

11. GSA General Services Administration
F St. & 18th St., NW
Washington, D.C. 20405
(202) 708-5082

12. MIL Military Standardization Documents
(U.S. Department of Defense)
Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, PA 19120

13. NIST National Institute of Standards and Technology
(U.S. Department of Commerce)
Gaithersburg, MD 20899
(301) 975-2000

14. OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
200 Constitution Avenue, NW
Washington, D.C. 20210
(202) 219-6091

15. PS Product Standard of NBS
(U.S. Department of Commerce)
Government Printing Office
Washington, D.C. 20402
(202) 738-3238

16. USPS U.S. Postal Service
475 L'Enfant Plaza, SW
Washington, D.C. 20260-0010
(202) 268-2000

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 01097

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01098 - CODES, REGULATIONS AND STANDARDS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY

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

1. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.

2. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

1.3 CODES, REGULATIONS AND STANDARDS

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

B. **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 Designer harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the contractor , the contractor's employees, or subcontractors.

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

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

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

b. Respiratory Protection
Title 29, Part 1910, Section 134 of the Code of Federal Regulations
Title 29, Part 1926, Section 103 of the Code of Federal Regulations

c. Personal Protective Equipment for General Industry
Title 29, Part 1910, Section 132 of the Code of Federal Regulations
Title 29, Part 1926, Sections 95 - 107 of the Code of Federal Regulations

d. Access to Employee Exposure and Medical Records
Title 29, Part 1926, Section 33 of the Code of Federal Regulations

e. Hazard Communication
Title 29, Part 1926, Section 59 of the Code of Federal Regulations

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

g. Permit Required Confined Space
Title 29, Part 1910, Section 146 of the Code of Federal Regulations

h. Construction Industry
Title 29, Part 1910, Section 1001 of the Code of Federal Regulations
Title 29, Part 1926, Section 1101 of the Code of Federal Regulations

i. Construction Industry - General Duty Standards
Title 29, Part 1926, Sections 20 through 35 of the Code of Federal Regulations

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

a. Hazardous Substances
Title 49, Part 171 and 172 of the Code of Federal Regulations

b. Hazardous Material Regulations
General Awareness and Training Requirements for Handlers, Loaders and Drivers
Title 49, Parts 171-180 of the Code of Federal Regulations

c. Hazardous Material Regulations
Editorial and Technical Revisions
Title 49, Parts 171-180 of the Code of Federal Regulations

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

a. Asbestos Hazard Emergency Response Act (AHERA) Regulation
Title 40, Part 763, Sub-part E of the Code of Federal Regulations, (This only applies to employees of a unit of local government doing Asbestos work).

b. EPA Model Accreditation Plan - Asbestos Containing Materials Final Rule & Notice
Title 40, Part 763, Sub-part E, Appendix C of the Code of Federal Regulations

c. National Emission Standard for Hazardous Air Pollutants (NESHAP)
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

D. **State and Local Requirements:** which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to the following:

1. State of Delaware, Department of Natural Resources and Environmental Control "Delaware Regulations Governing the Control of Air Pollution Emission Standard for Asbestos". November 27, 1985, updated June 16, 1995.

2. State of Delaware Asbestos Contractor, Supervisor, and Worker Certification Program.

3. All workers must complete the State of Delaware Asbestos Abatement Program certificate course.

4. All contractors must have Delaware State Certification.

5. State of Delaware Hazardous Chemical Information Act (Right-to-know)

6. Abide by all local requirements, which govern asbestos abatement work or hauling & disposal of asbestos waste materials.

1.4 NOTICES:

A. U.S. ENVIRONMENTAL PROTECTION AGENCY

1. Postmark or Deliver Written Notification as required by USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M) to the regional Asbestos NESHAP Contact at least 10 working days prior to beginning any work on asbestos-containing materials (ACM). Send notification to the following address:

a. REGION 3 - Asbestos NESHAP Contact
USEPA - Air Management Division
841 Chestnut Street
Philadelphia, PA 19107
(215) 597-6550

2. Notification: Include the following information in the notification sent to the NESHAP contact:

a. Indication whether the notification is the original or revised notification
b. Name, address, and telephone number of owner or operator.
c. Name, address, and telephone number of contractor.
d. Type of Operation (demolition or renovation).
e. Description of the facility or affected part of the facility being demolished or renovated, including the size (square feet [square meters], number of floors), age, present and prior use of the facility.
f. Estimate of the approximate amount of RACM to be removed from the facility in terms of linear meters [linear feet] of pipe, and surface area in square meters [square feet] of other facility components. Also estimate the approximate amount of Category I and Category II non-friable ACM in the affected part of the facility that will not be removed before demolition.

g. 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) or 1 cubic meter (35 cubic feet) if the length and width could not be measured. On other facility components, explain techniques of estimation.

h. Location and street address (including building number or name and floor or room number, if appropriate), city county, and state, of the facility being demolished or renovated.

i. Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of 40 CFR 61.145.

j. Scheduled starting and completion dates of demolition or renovation.

k. Nature of planned demolition or renovation and method(s) to be used, including demolition or renovation techniques to be used and description of affected facility components.

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

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

n. A certification that at least one person trained as required by paragraph (c)(8) of 40 CFR 61.145 will supervise the stripping and removal described by this notification.

o. For emergency renovations described in paragraph (a)(4)(iv) of 40 CFR 61.145 , the date and hour that the emergency occurred, a description of the sudden, unexpected event, and an explanation of how the event caused an unsafe condition, or would cause equipment damage or an unreasonable financial burden.

p. Description of procedures to be followed in the event that the unexpected RACM is found or Category II non-friable ACM becomes crumbled, pulverized, or reduced to powder.

q. Name, address, and telephone number of the waste transporter.

B. STATE AND LOCAL AGENCIES:

1. Send written notification as required by State of Delaware Department of Natural Resources & Environmental Control and local regulations prior to beginning any work on Asbestos Containing Materials. Use the form attached to this section for notification.

1.5 PERMITS:

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

B. Contractor is responsible for obtaining any demolition, building, renovation or other permits, and for paying application fees, if any, where required by State or Local jurisdictions.

1.6 LICENSES:

A. 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.

1.7 POSTING AND FILING OF REGULATIONS

A. **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 standard. Maintain one copy of each at job site. Keep on file in Contractor's office one copy of each.

1.8 SUBMITTALS:

A. **Before Start of Work:** Submit the following to the Owner's Representative for review. No work shall begin until these submittals are returned with Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. 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 including:

a. State and Local Regulations: Submit copies of codes and regulations applicable to the work.

2. Notices: Submit notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.

3. Permits: Submit copies of current valid permits required by state and local regulations.

4. Licenses: Submit copies of all State and local licenses and permits necessary to carry out the work of this contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION - 01098

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01301 - SUBMITTALS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including the following:

1. Contractor's construction schedule (covered in section 01043)
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings.
5. Product Data.
6. Samples.
7. Quality Assurance Submittals.
8. Miscellaneous Submittals

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:

1. Permits
2. Applications for payment (Schedule of values submittal is included in this section)
3. Performance and payment bonds
4. Insurance certificates
5. List of Sub-contractors
6. Non-collision statement
7. General statement
9. Requests for Change Order

1.3 SUBMITTAL PROCEDURES

A. **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.

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

2. 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.

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

B. **Processing:** To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals.

1. Allow 2 weeks for initial review. Allow additional time if the Owner's Representative must delay processing to permit coordination with subsequent submittals. The Owner's Representative will promptly advise the Contractor when a submittal being processed must be delayed for co-ordination.

2. If an intermediate submittal is necessary, process the same as the initial submittal.

3. Allow 2 weeks for reprocessing each submittal.

4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Owner's Representative sufficiently in advance of the Work to permit processing.

C. **Submittal Preparation:** Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

D. **Submittal Transmittal:** Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Owner's

Representative using a transmittal form. The Owner's Representative will not accept submittals received from sources other than the Contractor.

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations form Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 SUBMITTAL SCHEDULE

A. **Listing:** At the end of this section is a listing of the principal submittals required for the work. This listing is not necessarily complete, nor does the listing reflect the significance of each submittal requirement. The listing is included only for the convenience of users of the Contract Documents.

Note: Bar-chart schedule requirement now found in section 01043, 1.9 "Contractor's Construction Schedule", A. "Bar-chart Schedule".

B. **Submittal Schedule:** After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.

2. Prepare the schedule in chronological order. Provide the following information:

a. Scheduled date for the first submittal.
b. Related Section number.
c. Submittal category (Shop Drawings, Product Data, or Samples).
d. Name of the subcontractor.
e. Description of the part of the Work covered.
f. Scheduled date for resubmittal.
g. Scheduled date for the Owner's Representative's final release or approval.

C. Distribution: Following response to the initial submittal, print and distribute copies to the Owner's Representative, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

D. Schedule Updating: Revise the schedule after each meeting or activity where revisions are made. Issue the updated schedule concurrently with the report of each meeting.

1.5 PRODUCT DATA

A. 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."

1. 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:

a. Manufacturer's printed recommendations.
b. Compliance with recognized trade association standards.
c. Compliance with recognized testing agency standards.
d. Application of testing agency labels and seals.
e. Notation of dimensions verified by field measurement.
f. Notation of coordination requirements.

2. Field samples are full-size examples erected on-site to illustrate finishes, coatings, or finish materials and to establish the Project standard. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record activity.

1.6 CO-ORDINATION DRAWINGS:

A. Submit co-ordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.7 SAMPLES

A. **Submit full-size, fully fabricated Samples** cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture, and pattern.

1. Submit Samples for review of size, kind, color, pattern, and texture. Submit Samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

1.8 MISCELLANEOUS SUBMITTALS:

A. **Material Safety Data Sheets:** Process material safety data sheets as “Product data.” These are submitted for information purposes only, they will be returned with the action stamp, “Received - Not Reviewed.”

B. **Coordination Drawings:** Submit coordination drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

C. **Inspection and Test Reports:** Classify each inspection and test report as being either “shop drawings” or “product data” depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.

D. **Records of Actual Work:** Furnish 4 copies of records of actual work, one of which will be returned for inclusion in the record documents as specified in section "Project Closeout".

E. **Standards:** Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Owner's Representative's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the work.

F. **Closeout Submittals:** Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information.

G. **Record Documents:** Furnish set of original documents as maintained on the project site. Along with original marked -up record drawings provide 2 photographic copies of marked-up drawings, which, at the Contractor's option, may be reduced to not less than half size.

1.9 OWNER'S REPRESENTATIVE'S ACTION

A. Except for submittals for the record or information, where action and return is required, the Owner's Representative will review each submittal, mark to indicate action taken, and return promptly.

1. Compliance with specified characteristics is the Contractor's responsibility.

B. **Action Stamp:** The Owner's Representative will stamp each submittal with a uniform, action stamp. The Owner's Representative will mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: When the Owner's Representative marks a submittal "Approved," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.

2. Final-But-Restricted Release: When the Owner's Representative marks a submittal "Approved as Noted," the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.

3. Returned for Resubmittal: When the Owner's Representative marks a submittal "Not Approved, Revise and Resubmit," do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

a. Do not use, or allow others to use, submittals marked "Not Approved, Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

4. Received - Not Reviewed: When the Owner's Representative marks a submittal "Received - Not Reviewed" this acknowledges that the submittal has been received. This action applies to materials that are to be submitted for information purposes only, and where no review or action by the Owner's Representative is required.

5. Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Owner's Representative will return the submittal marked "Action Not Required."

C. Unsolicited Submittals: The Owner's Representative will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SUBMITTAL CHECKLIST

The submittals required from the Contractor include, but are not limited to the following:

01013 Summary of Work - Asbestos Abatement

Before Start of Work:

Plan of Action

Pre-construction Inspection

01028 Application for Payment - Asbestos Abatement

Before Start of Work:

Schedule of Values

Periodically During Work:

Refer to section for specific requirements for Payment Requests

01043 Project Coordination - Asbestos Abatement

Before Start of Work:

Contingency Plans

Telephone Numbers

Notifications sent to other entities at the work site.

Notifications sent to emergency service agencies.

Resume: of general superintendent.

Accreditation: of accreditation of general superintendent include qualifications to run Type C unit.

Staff Names:

Periodically During Work:

Daily Logs

Event Reports

Accident Reports

Discovered Condition Reports

01091 Definitions and Standards - Asbestos Abatement

Before Start of Work:

None

Periodically During Work:

None

01092 Codes, Regulations, and Standards - Asbestos Abatement

Before Start of Work:

State of Delaware Regulations

State of Delaware Asbestos Contractor's Licence
Notifications to DNREC and EPA
Permits (where applicable)

Periodically During Work:

None

<u>01098 Sate of Delaware Regulations</u>

Before Start of Work:

State of Delaware Asbestos Contractor’s License
DNREC and EPA notifications
Permits (where applicable)

<u>01301 Submittals</u>

Before Start of Work:

Contractors Construction Schedule
Submittal Schedule

Periodically During Work:

Record Documents

<u>01410 Test Laboratory Services</u>

None

<u>01503 Temporary Facilities - Asbestos Abatement</u>

Before Start of Work:

Scaffolding
Hot water heater
Decontamination Unit Sub-panel
Ground Fault Circuit Interrupters (GFCI)
Lamps and Light Fixtures
Temporary Heating Units
Temporary Cooling Units
Self Contained Toilet Units: Product Data, Sub-contractor
First Aid Supplies
Fire Extinguishers: product data, location schedule

Periodically During Work:

None

<u>01513 Local Exhaust System</u>

Before Start of Work:

Local Exhaust System Design

HEPA Filtered Fan Units: Product data
Monitoring Equipment: Product data
Auxiliary Generator: Product data.
Power Switch: Product data.
Auxiliary Power System: Shop Drawing

Periodically During Work:
Air Flow Monitoring Results

01526 Temporary Enclosures

Before Start of Work:
Spray Cement: Product data.
Spray Cement: Manufacturer's installation instructions.
Spray Cement: Material Safety Data Sheet.
Sheet Plastic: Test reports on NFPA 701 test.
Signs: Samples

Periodically During Work:
None

01560 Worker Protection - Asbestos Abatement

Before Start of Work:
State of Delaware License: for each worker.
Historic Airborne Fiber Data.
Certificate Worker Acknowledgement: for each worker.
Report from Medical Examination: of each worker.

Periodically During Work:
None

01562 Respiratory Protection

Before Start of Work:
Product Data.
NIOSH and MSHA Certifications.
Type "C": System Diagram.
Type "C": Operating Instruction.
Respiratory Protection Program: written manual.
Respiratory Protection Program: form at end of section.
Historic Airborne Fiber Data.
Resume information.

Periodically During Work:
None

01563 Decontamination Units

Before Start of Work:

Personnel Decontamination Unit: shop drawing.
Equipment Decontamination Unit: shop drawing.
Shower Pan: shop drawing.
Shower Walls: product data.
Shower Head and Controls: product data.
Filters: product data.
Filters: shop drawing.
Hose Bib: product data.
Wash Station Shower Stall: product data.
Wash Station Shower Stall: shop drawing.
Elastomeric membrane: product data.
Lumber: product data on fire resistance treatment.
Sump Pump: product data.
Signs: samples.

Periodically During Work:

None

01601 Materials and Equipment - Asbestos Abatement

Before Start of Work:

Product List Schedule

Periodically During Work:

None

01632 Product Substitutions - Asbestos Abatement

Before Start of Work:

Refer to section.

Periodically During Work:

Refer to section

01701 Project Closeout - Asbestos Abatement

Before Start of Work:

None

Periodically During Work:

Refer to section

01711 Project Decontamination

Before Start of Work:

None

Periodically During Work:
Fire Test on Lock Back Encapsulants used.

01712 Cleaning & Decontamination Procedures
None

01714 Work Area Clearance
None

02081 Removal of Asbestos-Containing Materials
Before Start of Work:
Surfactant: product data.
Removal Encapsulant: product data.
NESHAPS Certification: on surfactant or removal encapsulant.
Material Safety Data Sheet: for each surfactant and encapsulant
Periodically During Work:
None

02082 Removal of Asbestos-Contaminated Soil
None

02084 Disposal of Asbestos-Containing Waste Material
Before Start of Work:
Waste Hauler State and/or Local License
Name and address of landfill.
Chain of Custody form
Waste Manifest Form.
Periodically During Work:
On a weekly basis: copies of manifests and disposal site receipts.

02085 Resilient Floor Covering Manufacturer's Recommended Work Practices
Before Start of Work:
Wetting Materials: Product Data
Removal Encapsulant: Product Data
NESHAPS Certification: On Surfactant or Removal Encapsulant
Plan of Action for Dry Ice Use (if used)
Adhesive Removal Solvent: Product Data
Periodically During Work:
None

02087 Resilient Flooring Removal - Asbestos Abatement

Before Start of Work:

Wetting Materials: Product Data
Removal Encapsulant: Product Data
NESHAPS Certification: On Surfactant or Removal Encapsulant
Plan of Action for Dry Ice Use (if used)
Adhesive Removal Solvent: Product Data

Periodically During Work:

None

TIME CONSOLIDATED SUBMITTALS LISTING -

I. WITH BID:

1. Bid Form - Prices - Number of Days - Acknowledgement of Addenda
2. Sample Certificate of Insurance
3. Bid Bond or Certified Check in the Amount of 10% of Bid
4. Sub-Contractors List
5. Notification of Citation - Current
6. Non-Collusion Statement
7. References related to this work
8. Delaware Certification
9. City of Wilmington License - if required
10. List of Major Equipment

II. BEFORE START OF WORK:

1. Pre-Construction Inspection
2. Project Cordination
3. Permits
4. Notifications to DNREC & EPA
5. Work Area Design & Layout Plans with Local Exhaust Air Circulation System
6. Type "C" System Diagram and Operating Instruction
7. Product Substitution
8. Employee Training & Certification Documents - current (for each employee)
9. Employee Health Documentation
10. Equipment Certification
11. Rental Equipment Notification
12. NIOSH Approved Respirators
13. Documentation of Respirator fit test & Protection Program
14. Periodic Job Progress Format

15. Filter Change Log Format
16. Work Schedule & Manpower Requirements (number on job)
17. Contingency Plan for Emergency Action with Telephone Numbers and Connections of Emergency Services
18. Name of Job Foreman
19. Performance Bond
20. MSDS Sheets
21. Certificate of Worker Acknowledgement

III. WITH APPLICATION OF PAYMENT:

1. Certification of Work Completion
2. Waiver of Mechanics Lien & Proof that Taxes were Paid
3. Certification of Visual Inspection
4. Asbestos Disposal Chain of Custody
5. Disposal Receipts and Bill of Lading
6. Release from All Sub-Contractors

END OF SUBMITTAL CHECKLIST

END OF SECTION 01301

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01503 - TEMPORARY FACILITIES - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY

A. **This Section includes requirements** for construction facilities and temporary controls, including temporary utilities, support facilities, and security and protection.

B. **Temporary utilities include**, but are not limited to, the following:

1. Water service and distribution.
2. Temporary electric power and light.
3. Temporary heat.
4. Ventilation.
5. Telephone service.
6. Sanitary facilities, including drinking water.
7. Storm and sanitary sewer.

C. **Support facilities include**, but are not limited to, the following:

1. Field offices, laboratories and storage sheds.
2. Temporary enclosures.
3. Hoists and temporary elevator use.

D. **Security and protection facilities include**, but are not limited to, the following:

1. Temporary fire protection.
2. Barricades, warning signs, and lights.

1.3 DESCRIPTION OF REQUIREMENTS:

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

1.4 SUBMITTALS

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

1. Hot water heater: Submit manufacturers name, model number, size in gallons (liters), heating capacity, power requirements.
2. Decontamination Unit Sub-panel: Submit product data.
3. Ground Fault Circuit Interrupters (GFCI): Submit product data.
4. Lamps and Light Fixtures: Submit product data.
5. Temporary Heating Units: Provide product data.
6. Temporary Cooling Units: Provide product data and installation instructions.
7. Self Contained Toilet Units: Provide product data and name of sub-contractor to be used for servicing self contained toilets. Submit method to used for servicing.
8. Fire Extinguishers: Provide product data. Submit schedule indicating location at job site and compliance with NFPA 10 and NFPA 241.
9. Scaffolding: Submit list of rolling and fixed scaffolding intended for use on the project. Submit sufficient detail to indicate compliance with application worker safety regulations or other requirements.
10. Temporary Utilities: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
11. Implementation and Termination Schedule: Within 15 days of the date established for commencement of the Work, submit a schedule indicating implementation and termination of each temporary utility.

1.5 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:

1. Building code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, fire department, and rescue squad rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."

C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70 "National Electric Code."

D. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. General: Provide new materials and equipment. If acceptable to the Owner or Owner's Representative, the Contractor may use undamaged, previously used materials and equipment in serviceable condition. Provide materials and equipment suitable for use intended.

B. Lumber and Plywood:

1. For job-built temporary offices, shops, and sheds within the construction area, provide UL-labeled, fire-treated lumber and plywood for framing, sheathing, and siding.

2. For fences and vision barriers, provide minimum 1/2-inch- thick exterior plywood.

C. **Scaffolding:** Provide scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of scaffolding shall comply with applicable OSHA provisions.

1. Equip rungs of metal ladders, etc. with an abrasive non-slip surface.

2. Provide a nonskid surface on scaffold surfaces subject to foot traffic.

2.2 WATER SERVICE

A. **Water:** Provide potable water approved by local health authorities.

B. **Temporary Water Service Connection:** 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 where water will not damage existing finishes or equipment. Provide separate hoses and/or/ pumps for shower water and amended water, without the possibility of cross connection.

C. **Water Hoses:** Provide heavy-duty, abrasion-resistant, flexible hoses in diameters and lengths necessary to adequately serve temporary facilities, and with a pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.

1. 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.

D. **Hot Water Heater:** Provide UL rated minimum 40 gallon electric hot water heater to supply hot water for the Decontamination Unit shower. Activate from 30 amp circuit breaker located within the Decontamination Unit sub-panel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor

with type L copper. Drip pans shall consist of a 12" X 12" X 6" deep pan, made of 19 gauge galvanized steel, with handles. A 3-quart kitchen saucepan may be substituted for this purpose. Drip pan shall be securely fastened to the hot water heater with bailing wire or similar material. Wiring of the hot water heater shall be in compliance with NEMA, NECA, and UL standards.

E. **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 only if authorized in writing by the Building Owner or Building Owner's Representative.

2.3 ELECTRICAL SERVICE:

A. **General:** Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

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

1. Connection to the buildings main distribution panel is to be made by a licensed electrician

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

D. **Electrical Outlets:** Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters (GFCI), reset button, and pilot light for connection of power tools and equipment.

1. Locate GFCI's exterior to Work Area so that circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise

required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.

E. **Electrical Power Cords:** Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio. Electrical cords will be taped to the side of the containment to minimize contact with the ground and water.

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

2.4 TEMPORARY HEAT:

A. **Heating Units:** Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from a branch circuit with ground fault circuit interrupter.

2.5 TEMPORARY COOLING:

A. **Cooling Units:** When necessary for safety or to maintain operating equipment in the area, provide temporary cooling units consisting of a fan coil unit inside the work area with a compressor and heat rejection coil outside.

2.6 TEMPORARY STRUCTURES (When required)

A. **Temporary Offices:** Provide prefabricated or mobile units or similar job-built construction with lockable entrances, operable windows, and serviceable finishes. Provide heated and air-conditioned units on foundations adequate for normal loading.

B. **Temporary Toilet Units:** Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented

and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

2.7 FIRST AID

A. First Aid Supplies: Comply with governing regulations and recognized recommendations within the construction industry.

2.8 FIRE EXTINGUISHERS:

A. Fire Extinguishers: Provide hand-carried, portable, UL-rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, Class ABC, dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for the exposures.

B. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. General: Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Require that personnel accomplishing this work be licensed as required by local authority for the work performed.

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

3.2 SCAFFOLDING:

A. **During the erection and/or moving** of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged.

B. **Clean** as necessary debris from non-slip surfaces.

C. **At the completion of abatement work** clean construction aids within the work area, wrap in one layer of 6 mil polyethylene sheet and seal before removal from the Work Area.

3.3 TEMPORARY UTILITY INSTALLATION

A. **General:** Engage the appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

1. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

3. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Owner's Representative. Neither the Owner nor the Owner's Representative will accept cost or use charges as a basis of claims for Change Orders.

B. **Water Service:**

1. 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 g.p.m each to hot and cold water supply. Install using vacuum breakers or other backflow preventer as required by local authority. Hot water shall be supplied at a minimum temperature of 100 degrees F. Supply hot and cold water to the Decontamination Unit in accordance with Section 01563.

a. 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.

2. Sterilization: Sterilize temporary water piping prior to use.

C. Electrical Service:

1. Lock out: Lock 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.

a. Comply with requirements to OSHA 29 CFR 1910.147 the control of hazardous energy lock out/tag out.

b. Lock out power to Work Area by switching off breakers serving power or lighting circuits in work area. Tagout breakers with notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who has locked panel.

c. Lock out power to circuits running through Work Area wherever possible by switching off and locking all breakers serving these circuits. Tag out breakers with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to authorized person who has applied locks. If circuits cannot be shut down for any reason, label at intervals of 4-feet" on center with signs reading, "DANGER live electric circuit. Electrocution hazard." All asbestos abatement work in the vicinity of the live circuit is to be performed dry. All necessary notifications and procedures for dry removal are to be followed.

d. Lock out power to electrical equipment located in the work area, and to any fans or other equipment that is going to be worked on.

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

by Owner or Owner's Representative. Panel is to be installed by a licensed electrician.

3. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

4. 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, unless authorized in writing by Owner or Owner's Representative.

5. 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.

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

a. One Circuit for each HEPA filtered fan unit

b. 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).

c. One outlet in the work area for each 2500 square feet of work area

d. One outlet at each decontamination unit, located in equipment room

7. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's or Owner's Representative's exclusive use while conducting visual inspection and air sampling during the work as follows:

a. One in each work area

b. One at clean side of each Decontamination Unit.

c. One at each exhaust location for HEPA filtered fan units

8. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's or Owner's Representative's exclusive use for conducting visual inspection and final air sampling as set forth in Section 01711 Project Decontamination as follows:

a. Five inside work area

b. Two outside work area in location designated by Owner's Representative.

D. Temporary Lighting:

1. Lock out: Lock out existing power to lighting circuits in Work Area as described in section 01526 Temporary Enclosures. 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.

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

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

b. Provide lighting in areas where work is being performed as required to supply a 100 foot candle minimum light level.

c. Provide lighting in any area being subjected to a visual inspection as required to supply a 100 foot candle minimum light level.

d. Provide lighting in the Decontamination Unit as required to supply a 50 foot candle minimum light level.

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

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

E. Temporary Heat:

1. General**:** Provide temporary heat where indicated or needed for performance of the Work.

2. Heating Facilities: Except where the Owner authorizes use of the permanent system, provide vented, self-contained, LP-gas or fuel oil heaters with individual space thermostatic control.

a. Use of gasoline-burning space heaters, open flame, or salamander heating units is prohibited.

3. Maintain a minimum temperature of 70 degrees F where finished work has been installed.

4. Maintain a minimum temperature of 75 degrees F in the shower of the decontamination unit.

5. Maintain a minimum temperature of 65 degrees F in the Work Area at all times that work is going on. At all other times and at completion of removal work, but before start of reconstruction work, maintain a minimum temperature of 50 degrees F.

6. Maintain a minimum temperature of 50 degrees F in the Work Area at all times during and after removal work.

F. Temporary Cooling Requirements will be determined (when required) at pre-bid meeting.

G. Sanitary Facilities:

1. Sanitary facilities include temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for the type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project's needs.

a. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used material.

2. Toilets: Use of the Owner's existing toilet facilities will be permitted, so long as facilities are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to the condition prevalent at the time of initial use. Written permission from the owner must be obtained, and all provisions of these specifications regarding leaving the work area condition are met.

3. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

4. Provide separate facilities for male and female personnel.

5. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.

6. Drinking-Water Facilities: Provide containerized, tap-dispenser, bottled-water drinking-water units, including paper supply.

b. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.

7. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds, and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.

a. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.

b. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

3.4 SUPPORT FACILITIES INSTALLATION

The following may apply to larger scale projects. Specific application of these sections will be determined at pre-bid meeting.

A. **Locate field offices**, field laboratories, storage sheds, and other temporary construction and support facilities for easy access.

1. Maintain support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. **Provide incombustible construction** for offices, shops, and sheds located within the construction area or within 30 feet of building lines. Comply with requirements of NFPA 241.

C. **Project Administrator's Field Office:** Provide air conditioned, heated office space near the Work Area for professional person, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. floor area. Equip office with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36 inches X 96 inches plan table, and one 24 inches X 48 inches work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.

D. **Field Laboratory:** Provide air conditioned, heated office space near the Work Area for a laboratory space, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. floor area. Equip field laboratory with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36 inches X 96 inches plan table, and one 24 inches X 48 inches work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.

E. **Field Offices and Laboratory:** Provide insulated, weather tight temporary offices of sufficient size to accommodate required personnel at the Project Site. Keep the office clean and orderly for use for small progress meetings. Furnish and equip offices as follows:

1. Furnish with a desk and chairs, a 4-drawer file cabinet, plan table, plan rack, and a 6-shelf bookcase.

2. Equip with a water cooler and private toilet complete with water closet, lavatory, and medicine cabinet unit with a mirror.

F. **Storage and Fabrication Sheds:** Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters or fully enclosed spaces within the building or elsewhere on-site.

G. **Temporary Enclosures:** Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities.

1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. or less with plywood or similar materials.

3. Close openings through floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.

4. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

H. **Temporary Lifts and Hoists:** Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 FIRE PROTECTION FACILITIES INSTALLATION

A. **Except for use of permanent fire protection** as soon as available, do not change over from use of temporary security and protection facilities to permanent facilities until Substantial Completion, or longer, as requested by the Owner’s Representative.

B. **Temporary Fire Protection**: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.

3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for fighting fires.

4. Prohibit smoking within any building, structure, other enclosures or in hazardous fire-exposure areas.

5. Prohibit smoking in hazardous fire-exposure areas.

6. Provide supervision of welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

C. **Permanent Fire Protection**: At the earliest feasible date in each area of the Project, complete installation of the permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

D. **Barricades, Warning Signs, and Lights:** Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed, provide lighting, including flashing red or amber lights.

E. **Environmental Protection:** Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid use of tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

2. Protection: Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Termination and Removal: Unless the Owner's Representative requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the Contractor's property. The Owner reserves the right to take possession of project identification signs.

2. At Substantial Completion, clean and renovate permanent facilities used during the construction period including, but not limited to, the following:

a. Replace air filters and clean inside of ductwork and housings.

b. Replace significantly worn parts and parts subject to unusual operating conditions.

c. Replace lamps burned out or noticeably dimmed by hours of use.

END OF SECTION 01503

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01513 - TEMPORARY PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

This section describes the use of the HEPA filter equipped local exhaust system and its monitoring relative to the maintenance of a differential pressure of 0.02 inches of water (static) within the work area as a means for preventing the release of airborne asbestos fibers from the work area into the clean areas of the structure and into the ambient environment.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED SECTIONS

A. **Heating and cooling requirements** are set forth in Section 01503 Temporary Facilities - Asbestos Abatement.

1.3 MONITORING

A. The contractor shall supply differential pressure manometers capable of monitoring and recording on a chart, differential pressures of 0.005 inches of water. The manometers shall be equipped with an automatically activated alarm system which will sound a warning when the differential pressure drops below the preset value.

B. **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).

1.4 SUBMITTALS

A. **Before Start of Work:** Submit design of pressure differential system to the Owner's Representative for review. Do not begin work until submittal is returned with the Owner's Representative action stamp indicating that the submittal is returned for unrestricted use. The Contractor shall comply with the submittal requirements of section 01301 (submittals) of this specification as they related to this section. Include in the submittal at a minimum:

1. Number of HEPA filtered fan units required and the calculations necessary to determine the number of machines
2. Description of projected air flow within Work Area and methods required to provide adequate air flow in all portions of the work area
3. Anticipated pressure differential across Work Area enclosures
4. Description of methods of testing for correct air flow and pressure differentials
5. Manufacturer's product data on the HEPA filtered fan units to be used
6. Location of the machines in the Work Area
7. Method of supplying adequate power to the machines and designation of building electrical panel(s) which will be supplying the power.
8. Description of work practices to insure that airborne fibers travel away from workers
9. Manufacturer's product data on equipment used to monitor pressure differential between inside and outside of Work Area.

(If an auxiliary power supply is required, the following submittals are also required.)

10. Manufacturer's product data on auxiliary generator to be used
11. Manufacturer's product data on auxiliary power switch to be used
12. Schematic diagram of power and auxiliary power supply to HEPA filtered fan units

B. **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 days 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. Label with project name, contractors name and date.

1.5 QUALITY ASSURANCE:

A. **Monitor pressure differential** at Personnel and Equipment Decontamination Units with a differential pressure meter equipped with a continuous recorder. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops below 0.02 inches of water.

PART 2 - PRODUCTS

2.1 HEPA FILTERED FAN UNITS:

A. 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.

B. 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:

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

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

3. Mounted on casters or wheels, or in the case of small/JR. units, handles are to be in place to allow for transport and securing.

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

D. 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.

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

2. Provide 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.

3. 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.

4. Pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. Provide units with the following pre-filters:

a. First-stage pre-filter: low-efficiency type (e.g., for particles 100 um and larger)

b. Second-stage (or intermediate) filter: medium efficiency (e.g., effective for particles down to 5 um)

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

E. Instrumentation: Provide units equipped with:

1. Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed

2. 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

3. Elapsed time meter to show the total accumulated hours of operation

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

1. Electrical (or mechanical) lockout to prevent fan from operating without a HEPA filter

2. Automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge

3. 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)

4. Audible alarm if unit shuts down due to operation of safety systems

G. **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.

2.2 AUXILIARY GENERATOR: (Use as required, applicability will be determined at pre bid meeting)

A. **Auxiliary Generator:** Provide a gasoline-powered self-starting generator with a capacity adequate to power a minimum of 50% of the HEPA filtered fan units in operation at any time during the work.

2.3 AUXILIARY POWER SWITCH:

A. **Auxiliary Power Switch:** Provide a switching relay which will automatically start auxiliary generator and switch over power supplied to HEPA filtered fan units to auxiliary generator.

PART 3 - EXECUTION

3.1 PRESSURE DIFFERENTIAL ISOLATION

A. **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.

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

C. **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:

1. Establish required air circulation in the work area, personnel and equipment decontamination units.

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

3. Exhaust a sufficient number of units from the work area to develop the required pressure differential.

4. The required number of units is the number determined above plus one additional unit.

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

6. Should it not be possible to exhaust to the outside of the building, vent each HEPA filtered fan unit to inlet of second unit. Vent second unit to a controlled area in the building. Insure that controlled area is isolated from balance of building by critical barriers at all times that units are in operation.

7. Mount units to exhaust directly or through disposable wire reinforced ductwork.

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

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

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

D. Isolation of elevators, stair towers, and return air intakes: Erect seals with an air space at doors to elevators and stair towers. Pressurize this space with HEPA-filtered air so that it is at a pressure greater than either the Work Area elevator shaft or stair tower.

1. In areas requiring non-combustible construction, fabricate seal by first sealing door with duct tape and 6-mil polyethylene. Construct a barrier from ⍰" gypsum board supported by 3-5/8" x 25 gauge metal studs at 16" on centers.

Space face of barrier a minimum of 3" from face of door. Seal barrier with 6-mil sheet plastic and duct tape.

2. In areas where fire resistance is sufficient, fabricate seal by first sealing door with duct tape and 6-mil polyethylene. Construct a barrier from ⍰" CDX plywood supported by 2" X 4" wood studs at 16" on centers. Space face of barrier a minimum of 3" from face of door. Seal barrier with 6-mil sheet plastic and duct tape.

3. Use plywood and framing lumber that is treated to be fire resistant.

4. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 inches of water higher in static pressure than any adjacent space.

5. Locate HEPA filtered fan unit outside of work area. Fabricate a manifold as required to distribute air to individual spaces to be isolated. Provide relief venting at unit as required to prevent shut down due to low airflow while still maintaining required air pressure.

E. **Isolation of chases and enclosed stairs:** Pressurize chases and enclosed stairs with HEPA filtered air so that it is at a pressure greater than any adjacent work area.

1. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 inches of water higher in static pressure than any adjacent work area.

F. **Isolation of chases and enclosed stairs:** Pressurize chases and enclosed stairs so that they are at a pressure greater than any adjacent work area.

1. Pressurize space with centrifugal-type fans. Axial type fans are not to be used for this purpose. Continuously maintain a pressure differential in this space a minimum of 0.02 inches of water higher in static pressure than any adjacent work area.

G. **Isolation of return air ductwork:** Return air duct work which must be kept operating is located in the Work Area. This ductwork is to be isolated from the Work Area by an enclosure forming an annular space around the duct which is positively pressurized with HEPA filtered air.

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

2. Enclose wrapped duct with two layers of polyethylene. Fabricate inner layer from 6-mil polyethylene with all seams sealed with spray glue and duct tape. Arrange outer layer to support inner layer. Fabricate out of reinforced sheet

plastic with seams sealed with spray glue and duct tape and reinforced with staples. Support outer layer with a framework fabricated from 2" x 4"s at 24" on center. Enclosures less than 2'-6" in diameter may be reinforced with box strapping in lieu of wood framing.

3.2 AUXILIARY GENERATOR (when required):

A. **Provide auxiliary gasoline-powered generator** located outside of the building in a location protected from the weather. Install the generator in a location so that the exhaust from the generator does not flow to any building ventilation or supplied air intakes. Arrange so that if a power failure occurs the generator automatically starts and supplies power to a minimum of 50% of the HEPA filtered fan units in operation.

3.3 AIR CIRCULATION IN THE WORK AREA:

A. **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.

B. **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 the worker protection program.

C. **Determining the Air circulation Requirements:** The airflow volume (cubic feet per minute) exhausted (removed) from the workplace must exceed the amount of makeup air supplied to the enclosure. Provide a fully operational air circulation system supplying a minimum air circulation rate of four (4) air changes per hour (or more if required at time of pre-bid).

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

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

2. Air Circulation Required in Cubic Feet of Air per Minute (CFM) =

$$\frac{\text{Volume of work area (cu. ft.)}}{\text{60 (minutes per hour)}} \times \text{Number of air changes per hour}$$

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

3.4 EXHAUST SYSTEM:

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

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

2. 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.

3. The end of the unit or its exhaust duct should be placed through an opening in the plastic barrier or wall covering. Seal plastic around the unit or duct with tape.

4. Vent to Outside of Building, unless authorized in writing by the Owner or Owner's representative.

5. Air Handling Unit Exhaust: The exhaust plume from air handling units should be located away from adjacent personnel and intakes for HVAC systems.

6. 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.

7. Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Owner or Owner's representative by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Cover with flaps to reseal automatically if the pressure differential system should shut down for any reason. Spray flap and

around opening with spray adhesive so that if flap closes meeting surfaces are both covered with adhesive. Use adhesive that forms contact bond when dry.

3.5 RECIRCULATION SYSTEM: (when approved for use by Owner's Representative in writing)

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

1. Recirculate air in the Work Area through HEPA filtered fan units to accomplish air circulation requirements of this section.

2. Location of Fan Units: Locate HEPA filtered fan units so that air is circulated through all parts of the Work Area, and so that required pressure is maintained at all parts of Work Area geometry. Move units as necessary, so that in any location where asbestos-containing materials are being disturbed, air movement is directed away from employees , and toward the HEPA filter fan unit. Direct airflow in these locations so that it is predominantly toward workers' backs at the breathing zone elevation.

3. A pressure differential of at least 0.01 inches of water (static pressure) between the personnel and equipment decontamination units and the building area outside the decontamination units will be maintained.

3.6 AIR CIRCULATION IN DECONTAMINATION UNITS:

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

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

2.. Equipment Decontamination Unit: Across the Holding Room with the Wash Room at a lower pressure than the Clean Room.

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

C. **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. At each opening, the airflow velocity must be sufficient to provide visible indications of air movement into the work area. The velocity of airflow within the enclosure must be adequate to remove airborne contamination from each worker's breathing zone without disturbing the asbestos-containing material on surfaces.

3.7 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM:

A. **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 Section 01503 "Temporary Facilities." Do not use existing branch circuits to power fan units.

B. **Air Flow Tests:** Airflow patterns will be checked before removal operations begin, at least once per operating shift and any time there is a question regarding the integrity of the enclosure. The primary test for airflow is to trace air currents with smoke tubes or other visual methods. Flow checks are made at each opening and at each doorway to demonstrate that air is being drawn into the enclosure and at each worker's position to show that air is being drawn away from the workers location and toward the HEPA filtration unit.

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

1. Squareness of HEPA Filter
2. Condition of Seals
3. Proper operation of all lights
4. Proper operation of automatic shut down if exhaust is blocked
5. Proper operation of alarms
6. Proper operation of Magnehelic gauge
7. Proper operation and calibration on pressure monitoring equipment

D. **Demonstrate Operation** of the pressure differential system to the Owner’s representative will include, but not be limited to, the following:

1. Plastic barriers and sheeting move lightly in toward Work Area,

2. Curtain of decontamination units move lightly in toward Work Area,

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

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

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

6. 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, ductwork or outside.

7. Modify the Pressure Differential System as necessary to demonstrate successfully the above.

E. Use of System During Abatement Operations:

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

2. Monitoring Pressure Within the Enclosure: After the initial air flow patterns have been checked, the static pressure must be monitored within the enclosure. Monitoring may be made using manometers, pressure gauges, or combinations of these devices. It is recommended that they be attached to alarms and strip chart recorders

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

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

5. Corrective Actions: If the manometers or pressure gauges demonstrate a reduction in pressure differential below the required level, work should cease and the reason for the change investigated and appropriate changes made. The air flow patterns should be retested before work begins again.

6. At completion of abatement work, allow fan units to run as specified under section 01711, 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.

F. Dismantling the System:

8. When a final inspection and the results of final air tests indicate that the area has been decontaminated, fan units may be removed from the Work Area. Before removal from the Work Area, remove and properly dispose of pre-filter, decontaminate exterior of machine and seal intake to the machine with 6 mil (0.15 mm) polyethylene to prevent environmental contamination from the filters.

END OF SECTION - 01513

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01526 - TEMPORARY ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

(The contractor shall comply with the submittal requirements of Section 01301 (submittals) of this specification as they relate to this section.)

A. **Before Start of Work** submit the following to the Owner or Owner's Representative for review. Do not begin work until these submittals are returned with the Owner's Representative's action stamp indicating that the submittal is returned for unrestricted use or stamped "Received – not Reviewed".

1. Strippable Coatings: Submit following:

    a. Product description including major components and solvents.

    b. Test report of ASTM E84 test of surface burning characteristics.

    c. Manufacturer's installation instructions. Indicate portions applicable to the project and selected assemblies where the manufacturer offers alternatives.

2. Spray Cement: Submit following:

    a. Product description including major components and solvents.

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

3. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.

4. Signs: Submit samples of signs to be used.

B. **Before Start of Work** submit the following to the Owner's representative for review. Do not begin work until these submittals are returned with the Owner's representative's action stamp indicating that the submittal has been' "Received – Not Reviewed."

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following;
   a. Strippable Coating.

   b. Spray Cement.

PART 2 - PRODUCTS

2.1 SHEET PLASTIC:

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6-mil thick, clear, frosted, or black as indicated.

B. **Polyethylene Sheet:** Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick frosted or black as indicated.

2.2 MISCELLANEOUS MATERIALS:

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

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

PART 3 - EXECUTION

3.1 SEQUENCE OF WORK:

A. **Carry out work of this section sequentially**. Complete each of the following activities in accordance with requirements before proceeding to the next.

1. Provide emergency exits and emergency lighting.
2. Control access
3. Provide respiratory and worker protection.
4. Provide Critical Barriers.
5. Prepare Area.
6. Provide Primary Barriers.
7. Provide Isolation Areas as required.
8. Provide Secondary Barrier.

3.2 GENERAL:

A. **Work Area:** the location where asbestos abatement work occurs. The Work Area 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.

B. **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 01711. Perform all such required cleaning or decontamination at no additional cost to owner.

C. Construct enclosures to provide an air-tight seal around ducts and openings into existing ventilation systems and around penetrations for electrical conduits, telephone wires, water lines, drain pipes, etc. Construct enclosures to be both airtight and watertight except for those openings designed to provide entry and/or airflow control.

D. **Size:** Construct enclosure with sufficient volume to encompass all of the working surfaces yet allow unencumbered movement by the worker(s), provide unrestricted airflow past the worker(s), and ensure walking surfaces can be kept free of tripping hazards.

E. **Shape:** The enclosure may be any shape that optimizes the flow of ventilation air past the worker(s).

F. **Structural Integrity:** The walls, ceilings and floors must be supported in such a manner that portions of the enclosure will not fall down during normal use.

G. **Barrier Supports:** Provide frames as necessary to support all unsupported spans of sheeting.

H. **Openings:** It is not necessary that the structure be airtight; openings may be designed to direct air flow. Such openings are to be located at a distance from active removal operations. They are to be designed to draw air into the enclosure under all anticipated circumstances. In the event that negative pressure is lost, they are to be fitted with either HEPA filters to trap dust or automatic trap doors that prevent dust from escaping the enclosure. Openings for exits are to be controlled by an airlock or a vestibule.

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

J. **Areas Within an Enclosure:** Each enclosure consists of a work area, a decontamination area, and waste storage area. The work area where the asbestos removal operations occur are to be separated from both the waste storage area and the contamination control area by physical curtains, doors, and/or airflow patterns that force any airborne contamination back into the work area.

K. **Removing Mobile Objects:** Clean movable objects and remove them from the work area before an enclosure is constructed unless moving the objects creates a hazard. Mobile objects will be assumed to be asbestos contaminated and are to be either cleaned with amended water and a HEPA vacuum and then removed from the area or wrapped and then disposed of as asbestos-contaminated waste.

L. **Disabling HVAC Systems:** The power to the heating, ventilation, and air conditioning systems that service the regulated area must be deactivated and locked out. All ducts, grills, access ports, windows and vents must be sealed off with two layers of plastic to prevent entrainment of contaminated air.

M. **Lockout power to Work Area** by switching off all breakers serving power or lighting circuits in work area. A lock and tag shall be placed on each breaker used to de-energize circuits and equipment with notation "DANGER CIRCUIT BEING WORKED ON". Lock panel and have all keys under control of authorized person who has applied the locks.

N. **Lockout power** to circuits running through work area wherever possible by switching off all breakers or removing fuses serving these circuits. Label breakers with tape

over breaker with notation "DANGER CIRCUIT BEING WORKED ON". Lock panel and have all keys under control of authorized person who applied locks. If circuits cannot be shut down for any reason, label at intervals 4 feet on center with signs reading, "DANGER LIVE ELECTRIC CIRCUIT-Electrocution Hazard." Label circuits in hidden locations but which may be affected by the work in a similar manner.

O. **Inspection Windows:** Install inspection windows in locations shown on the plans or as directed by the Owner's Representative. Each inspection window is to have a 24 inch X 24 inch viewing area fabricated from 1/4 inch acrylic or polycarbonate sheet. Install window with top at 6 feet-6 inches above floor height in a manner that provides unobstructed vision from outside to inside of the Work Area. Protect window from damage from scratching, dirt or any coatings used during the work. A sufficient number of windows are to be installed to provide observation of all portions of the Work Area that can be made visible from adjacent areas. Inspection windows that open into uncontrolled area are to be covered with a removable plywood hatch secured by lock and key. Provide keys to Owner's Representative for all such locks.

3.3 EMERGENCY EXITS:

A. **Provide emergency exits and emergency lighting** as set forth below:

1. Emergency Exits: At each existing exit door from the Work Area provide the following means for emergency exiting:

2. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work Area.

3. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1 inch wide. Hang a razor knife on a string beside outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2 inches wide.

4. If existing exit signs are not sufficient, provide lighted exit signs at each exit.

5. Provide battery operated emergency lighting that switches on automatically in the event of a power failure.

3.4 CONTROL ACCESS:

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

1. Submit to Owner's Representative a list of doors and other openings that must be secured to isolate Work Area. Include on list notation if door or opening is in an indicated exit route.

2. After receiving written authorization from the Owner's representative, lock all doors into Work Area, or, if doors cannot be locked, chain shut. Cover any signs that direct emergency exiting, either outside or inside of Work Area, to locked doors. Do not obstruct doors required for emergency exits from Work Area or from building.

3. After receiving written authorization from the Owner's Representative, construct partitions or closures across any opening into Work Area. Partitions are to be a minimum of 8 feet high.

4. Fabricate partitions from 2 inch X 4 inch wood studs with ⅜ inch plywood on both faces. Brace at intervals of 4 feet on center. Use only fire retardant treated wood.

5. Modify elevator controls to prevent elevators from stopping at doors in Work Areas. This work is to be performed by a qualified elevator technician.

6. Replace passage sets on doors required for exiting from Work Area with temporary locksets for duration of the project. Use entry type locksets that are key lockable from one side and always operable from inside. Install locksets with key side in stair tower and escape side on Work Area side. Provide one key to Owner and maintain one key in clean room of decontamination unit. After meeting Contractor release criteria set forth in Section 01711 Project Decontamination, reinstall original passage sets and adjust for proper operation.

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

1. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Do not use deadbolts or padlocks.

2. Provide one key for each door to Owner and Owner's Representative and maintain one key in clean room of decontamination unit (3 total).

C. **Visual Barrier:** Where the Work Area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6-mil in thickness so that the work procedures are not visible to building occupants. Where this visual barrier would block natural light, substitute frosted or woven rip-stop sheet plastic in locations approved by the Owner's Representative.

D. **Demarcation:** Demarcate the regulated area in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area.

E. **Access:** Limit access to regulated areas to authorized persons as defined by OSHA, and to the Owner, Designer, Project Administrator or a representative authorized by one of these entities.

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

1. Print text in both English and Spanish

Legend	**Notation**
KEEP OUT	3" Sans Serif Gothic or Block
CONSTRUCTION	1" Sans Serif Gothic or Block
WORK AREA	1" Sans Serif Gothic or Block
PROTECTIVE CLOTHING REQUIRED	
BEYOND THIS POINT	14 Point Gothic

Immediately inside door and outside critical barriers post an approximately 20 inch by 14 inch manufactured danger sign displaying the following legend with letter sizes and styles of a visibility required by OSHA (29 CFR 1926.58,k,l,ii):

LEGEND

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

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

3.5 ALTERNATE METHODS OF ENCLOSURE:

A. **Alternate methods** of containing the Work Area may be submitted to the Owner's Representative for approval in accordance with procedures set forth in Section 01632 Substitutions. Do not proceed with any such method(s) without prior written approval of the Owner's Representative.

3.6 RESPIRATORY AND WORKER PROTECTION:

A. **Before proceeding** beyond this point in providing Temporary Enclosures:
1. Provide Worker Protection per Section 01560
2. Provide Respiratory Protection per Section 01562
3. Provide Personnel Decontamination Unit per Section 01563

3.7 CRITICAL BARRIERS:

A. **Completely Separate** the Work Area from other portions of the building, and the outside by closing all openings with 2 independent layer sheet plastic barriers at least 6-mil in thickness, or by sealing cracks leading out of Work Area with duct tape.

B. **Individually seal** all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, and other openings into the Work Area with duct tape alone or with 2 independent layers of polyethylene sheeting at least 6-mil in thickness, taped securely in place with duct tape. Maintain seal until all work including Project Decontamination is completed. Take care in sealing of lighting fixtures to avoid melting or burning of sheeting.

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

D. **Mechanically Support** sheet plastic independently of duct tape or spray cement seals so that seals do not support the weight of the plastic. Following are acceptable methods of supporting sheet plastic barriers. Alternative support methods may be used if approved in writing by the Owner’s Representative.

Examples

1. Plywood squares 6 inch x 6 inch x 3/8 inch held in place with one 6d smooth masonry nail or electro-galvanized common nail driven through center of the plywood and duct tape on plastic so that plywood clamps plastic to the wall. Locate plywood squares at each end, corner and at maximum 4 feet on centers.

2. Nylon or polypropylene rope or wire with a maximum unsupported span of 10 feet, minimum ¼ inch in diameter suspended between supports securely fastened on either side of opening at maximum 1 foot below ceiling. Tighten rope so that it has 2 inches maximum dip. Drape plastic over rope from outside Work Area so that a two-foot long flap of plastic extends over rope into Work Area. Staple or wire plastic to itself 1 inch below rope at maximum 6 inches on centers to form a sheath over rope. Lift flap and seal to ceiling with duct tape or spray cement. Seal loop at bottom of flap with duct tape. Erect entire assembly so that it hangs vertically without a "shelf" upon which debris could collect.

E. **Provide Pressure Differential System** per Section 01513.

1. Clean housings and ducts of all overspray materials prior to erection of any Critical Barrier that will restrict access.

3.8 PREPARE AREA:

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

B. **Remove all electrical and mechanical items**, such as lighting fixtures, clocks, diffusers, registers, escutcheon plates, etc. which cover any part of the surface to be worked on with the work.

C. **Remove all general construction items** such as cabinets, casework, door and window trim, moldings, ceilings, trim, etc., which cover the surface of the work as required to prevent interference with the work. Clean, decontaminate and reinstall all such materials, upon completion of all removal work with materials, finishes, and workmanship to match existing installations before start of work.

D. **Clean all contaminated furniture**, equipment, and or supplies with a HEPA filtered vacuum cleaner or by wet cleaning, as specified in Section 01712 Cleaning and Decontamination Procedures, prior to being moved or covered. All equipment furniture, etc. is to be deemed contaminated unless specifically declared as uncontaminated on the drawings or in writing by the Owner's Representative.

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

F. **Cleaning and Sealing Surfaces:** After cleaning with water and a HEPA vacuum, surfaces of stationary objects should be covered with two layers of plastic sheeting. The sheeting should be secured with duct tape or an equivalent method to provide a tight seal around the object.

3.9 PRIMARY BARRIER:

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

1. Sealing Elevators: If an elevator shaft is located in the regulated area, it should be either shut down or isolated by sealing with two layers of plastic sheeting. The sheeting should provide enough slack to accommodate the pressure changes in the shaft without breaking the airtight seal.

2. Elevator: Coat walls, floor and ceiling of elevator in same manner as Work Area. Arrange entry to Work Area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section 01711. Refer to Section 01013 Summary of the Work for additional requirements for protection of elevator.

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

a. All seams in the sheeting should overlap, be staggered and not be located at corners or wall-to-floor joints.

b. Cover Floor of Work Area with 2 individual layers of clear polyethylene sheeting, each at least 6-mil in thickness, turned up walls at least 12 inches. Form a sharp right angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.

c. Cover Carpeting with three (3) layers of polyethylene sheeting at least 6-mil in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.

d. Cover Sheet Plastic in areas where scaffolding is to be used with a single layer of ⍰ inch CDX plywood or 1/4 inch tempered hardboard. Wrap edges and corners of each sheet with duct tape. At completion of abatement work wrap plywood or hardboard with 2 layers of 6-mil polyethylene and move to next Work Area or dispose of as an asbestos-contaminated waste material in accordance with section 02084 of this specification.

e. Elevator: Cover walls, floor, and ceiling of elevator with 2 layers of 6-mil polyethylene. Arrange entry to work area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section 01711. Refer to Section 01013 summary of the work for additional requirements for protection of elevator.

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

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

3.10 ISOLATION AREA:

A. **Maintain isolation areas** between the Work Area and adjacent building areas, as detailed in drawings and at pre bid meeting.

B. **Form isolation area** by controlling access to the space in the same manner as a Work Area. Physically isolate the space from the Work Area and adjacent areas. Accomplish physical isolation by: Installing critical barrier in unoccupied space and erecting a second critical barrier a minimum of 3 feet away from work area or other method specified in pre bid meeting.

3.11 STOP WORK:

A. **If the Critical or Primary barrier falls** or is breached in any manner stop asbestos removal work immediately and comply with Stop Work requirements of Section 01013 Summary of Work - Asbestos Abatement. Do not start work until authorized in writing by the Owner's Representative.

3.12 EXTENSION OF WORK AREA:

A. **Extension of Work Area:** If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, then add affected area to the Work Area, enclose it as required by this Section of the specification and decontaminate it as described in Section 01711 Project Decontamination.

3.13 SECONDARY BARRIER:

A. **Secondary layer** of plastic as a drop cloth to protect the primary layer from debris generated by the asbestos abatement work is specified in the appropriate work sections.

END OF SECTION - 01526

SECTION 01527 - REGULATED AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. **Worker Protection:** is specified in Section 01561 "Worker Protection – Repair and Maintenance"

B. **Respiratory Protection:** is specified in Section 01562 Respiratory Protection

C. **Wet Decontamination Facilities:** are described in Section 01563 Decontamination Units.

1.3 DESCRIPTION OF WORK:

A. Work of this section consists of preparing a Regulated Area for work of the following specification sections only. Do not use procedures set forth in this section in connection with any other work.

1. Section 01046 Cutting & Patching Asbestos Containing Materials

2. Section 01528 Entry Into Controlled Areas

3. Section 01529 Mini Enclosures and Glovebags

4. Section 01712 Cleaning and Decontamination Procedures

5. Section 02083 Disturbance of ACM During O&M Work

6. Section 09251 Gypsum Drywall – Asbestos Enclosures

7. Section 15254 Repair of Insulation and Lagging

1.4 SUBMITTALS

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

1. HEPA Filtered Vacuum Cleaners: Submit product data.

2. Signs: Submit samples of each type of sign to be used.

3. Warning Tape: Submit samples.

PART 2 - EQUIPMENT

2.1 PRODUCTS

A. HEPA Filter Vacuum Cleaners:

1. 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:

Nilfisk of America, Inc. 225 Great Valley Parkway Malvern, PA 19355 (800) 645-3475	HEPA filtered Vacuums
Minuteman International 111 South Route 53 Addison, IL 60101 (708) 627-6900	Minuteman HEPA Vacuums
Pullman-Holt (White) Corp. PO Box 16647 Tampa, FL 33617 (813) 645-3475	HEPA Filtered Vacuums

B. Plastic Sheet:

1. Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6-mil thick , clear, frosted, or black as indicated.

PART 3 - EXECUTION

3.1 SECURING WORK AREA:

A. **Secure work** area from access by occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area, by scheduling work for periods of time that the building in unoccupied, or by constructing temporary wood stud and plywood barriers.

3.2 DEMARCATION OF REGULATED AREA:

A. **Demarcation.** Demarcate the Regulated Area with a sheet plastic drop cloth, signs and barrier tape. Configure the regulated area in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos.

1. Drop Cloth: Cover floor in vicinity of Work Area and six (6) feet beyond, with 6-mil polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

2. Signs: Post warning signs that carry the following legends in both English and Spanish:

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

Legend	**Notation**
KEEP OUT	3 inch Block

b. Second Sign: Immediately inside the locked door and outside the controlled area post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

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

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

3.3 SCHEDULING:

A. **With the approval of Owner, work may be carried out** during normal working hours in those areas which can be completely secured by lockable doors from access by building occupants and staff, and which have HVAC equipment that can be shut down and locked off. Otherwise, work is to be carried out after building occupants and cleaning staff have left.

3.4 GENERAL PROCEDURES:

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

1. Setup and management of the controlled area is to be under the supervision of an OSHA Competent Person as described in Section 01043 Project Coordination - Asbestos Abatement

.

2. Before start of work comply with requirement for worker protection in section 01561, and respiratory protection in section 01562.

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

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

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

6. Cover floor in vicinity of Work Area and six (6) feet beyond, with 6-mil polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

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

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

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

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

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

b. Worker standing off the sheet HEPA vacuum thoroughly the worker standing on the sheet.

c. Worker on the sheet thoroughly HEPA vacuum all surfaces of the plastic sheet, bags, and any other items on the sheet including the worker's feet.

11. If moving to the next Work Area in the same secured area: Worker on the drop sheet is to don clean foot covers, placing each foot, in turn, off the sheet as the foot cover is put on. Remove clean foot covers at the next Work Area while standing on the sheet. Dispose of the used foot covers along with the plastic sheet at completion of work in that area. Do not reuse foot covers to move off the sheet.

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

13. Fold sheet and all its contents toward the center.

14. Place the sheet in a properly labeled disposal bag.

15. Neck down the bag and collapse it with the HEPA vacuum.

16. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times. ("Goose Neck")

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

B. **At completion of work** require all workers to complete wet decontamination procedures in accordance with Section 01560 Worker Protection - Asbestos-Abatement, or Section 01561 Worker Protection – Repair and Maintenance, as appropriate.

C. **Remove respirators using** the procedure in Section 01561 Worker Protection – Repair and Maintenance

D. **At completion of work** require all workers to complete wet decontamination procedures in accordance with Section 01560 Worker Protection – Asbestos Abatement.

END OF SECTION - 01527

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01528 - ENTRY INTO CONTROLLED AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **The provisions of this section apply** when entry is required into an area where such entry could cause contamination of portions of the building and/or where respiratory or other worker protection measures are required.

B. **Unless authorized in writing** by the Owner or Owner's Representative, the provisions of this section apply to only the following situations:

1. Entry into the space above a suspended ceiling where there is exposed friable asbestos-containing fire proofing, visible asbestos-containing debris, or other friable asbestos-containing surfacing material when the ceiling tiles in an area no greater than 6 feet by 12 feet area to be removed.

2. Entry through sealed access (access door, hatchway, locked door) into an area with friable asbestos-containing surfacing materials or visible debris.

C. **Worker Protection:** Use procedures of this section only where a negative exposure assessment has been made for these procedures. Historic airborne fiber data demonstrate that personal airborne fiber counts in the breathing zone of those performing the work can be continuously maintained at less than 0.1 fibers per cubic centimeter can be used as a part of this assessment.

D. **Area Protection:** Use procedures of this section only where historic airborne fiber data demonstrate that area samples in the work area can be continuously maintained at less than 0.01 fibers per cubic centimeter.

1.3 SUBMITTALS:

A. **Before the Start of Work:** Submit the following to the Owner's Representative for review. Begin no work until these submittals are returned with Owner's

Representative action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.

1. Historic Airborne Fiber Data: Submit airborne asbestos fiber count data from an independent air-monitoring firm to demonstrate:

a. The ability to perform work of this section while maintaining an airborne fiber count below 0.1 fibers per cubic centimeter in the breathing zone of the individual performing the work.

b. The ability to perform work of this section while maintaining an airborne fiber count below 0.01 fibers per cubic centimeter in the work area.

2. Include the following data for each procedure required by the work:
a. Date of measurements
b. Operations monitored
c. Sampling and analytical methods used and evidence of their accuracy
d. Number, duration, and results of samples taken

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 REGULATED AREA:

A. **Prior to beginning work** in this area establish a regulated area as described in Section 01527 Regulated Areas.

3.2 ACCESS THROUGH SUSPENDED CEILINGS:

A. **Remove acoustical panels** from ceiling suspension system using the following sequence:

1. Follow worker protection procedures including disposable coveralls and respirators required by Section 01560, and Section 01562.

2. Follow local area protection procedures of Section 01528. Spread layer of 6-mil polyethylene sheet on floor 6 feet further in extent than the size of the ceiling opening to be made.

3. HEPA vacuum around edges of all panels to be removed.

4. While holding nozzle of HEPA vacuum in vicinity slowly lift one edge of center ceiling panel. Immediately HEPA vacuum space at lifted edge. Lift entire panel straight up and HEPA vacuum all four sides.

5. Place panel on top of adjacent ceiling.

6. Place intake duct to HEPA Filtered Fan Unit per Section 01513 in space above ceiling and fasten in place. Operate machine continuously while ceiling is open.

7. Note that the operation of the HEPA vacuum is intended to clean the air in the location of the work. As such the nozzle should be kept above the ceiling as much as possible and the canister on the floor.

8. Climb to a position that permits access to the top of the ceiling adjacent to the removed panel.

9. Working in the space above the ceiling, HEPA vacuum both sides of the ceiling panel first removed and hand it down into a 6-mil polyethylene bag for storage.

10. Remove loose material hanging from the friable asbestos- containing material with the suction from the HEPA vacuum.

11. Pass wand of operating HEPA vacuum through air between asbestos-containing material and top of ceiling.

12. HEPA vacuum the tops of all ceiling panels that are in reach.

13. Carefully HEPA vacuum the crack between the suspension system and ceiling panels from the top for all ceiling panels within reach.

14. Remove ceiling panels as required while constantly HEPA vacuuming all four edges of panel and suspension system.

15. Working in space above ceiling HEPA vacuum both sides on each panel removed and hand each down into a 6-mil polyethylene bag which is labeled as set forth is Section 02084.

16. Maintain HEPA vacuum in operation with nozzle above ceiling and exhaust at floor for the entire time that the ceiling is open and work is being done above the ceiling.

17. When above-ceiling work is complete replace ceiling panels.

18. HEPA vacuum worker's head, arm, and shoulders before climbing down from ceiling.

19. HEPA vacuum ladder while climbing down.

20. While standing on plastic sheet thoroughly HEPA vacuum ladder and pass it to person standing off sheet.

3.3 ENTRY INTO CONTROLLED AREAS:

A. **Use same procedure as above** except that ceiling tiles do not need to be removed.

B. **If access is through a wall hatch or door**, duct tape floor sheet to wall or threshold

C. **If access is into large area** such as crawl tunnel, comply with worker protection requirements but use HEPA vacuum only for work procedures in the area.

3.4 PERSONNEL DECONTAMINATION:

A. **At the end of all work** change to a clean disposable coverall and leaving respirator in place proceed to a remote shower and decontaminate as required by Section 01560 Worker Protection - Asbestos Abatement.

B. **Complete dry decontamination** procedures set forth in Section 01561 Worker Protection - Repair & Maintenance.

END OF SECTION - 01528

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01529 - MINI ENCLOSURES AND GLOVEBAGS

PART 1 – GENERAL (FORMERLY "SMALL SCALE/SHORT DURATION WORK")

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF THE WORK:

A. **Work of this section** consists of preparing a Regulated Area for work for which there is no negative exposure assessment or that involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material. This is Class III OSHA work, and is limited in size to operations that generate small amounts of ACM, i.e., no more than can be contained in one standard (60 inch x 60 inch) glove or waste bag filled no more than 1/3 to 1/2 full.

1.3 SUBMITTALS:

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

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

2. 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.

3. NESHAP Certification: Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet ACM to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

4. Material Safety Data Sheet: Submit Material Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communications Standard (29 CFR 1910.1200) for each surfactant and encapsulating material proposed for used. Submit in the same manner as product data. Submittal is for information purposes only. Submittal will not be reviewed by "Owner's Representative". Include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.

5. Spray Cement: Submit following:

a. Product description including major components and solvents

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

.

6. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.

7. Glovebags: Submit product data.

8. HEPA Vacuums: Submit product data

9. Signs: Submit samples of signs to be used.

10. Mini-enclosure: Provide shop drawing of mini-enclosure arrangement to used.

B. **Before Start of Work** submit the following to the Owner's Representative for review. Do not begin work until these submittals are returned with the Owner's Representatives action stamp indicating that the submittal has been "Received - Not Reviewed.

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:

a. Surfactants.

b. Spray Cement.

c. Encapsulants.

PART 2 - PRODUCTS

2.1 GLOVE BAGS:

A. **Glovebags:** Provide minimum 6 mil thick polyethylene, polyvinyl chloride or equivalent plastic sack, with a seamless bottom, and two sealed inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for wand or HEPA vacuum wand. Glove bag is to be not more than 60 inches by 60 inches in size.

2.2 SHEET PLASTIC:

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6-mil thick, clear, frosted, or black as indicated.

B. **Fire Resistant Polyethylene Sheet:** When specifically required in pre bid meeting, or as determined on site during project by Owner's Representative, or at discretion of abatement contractor; when conditions such as above normal risk of fire and/or existence of hot equipment, provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick, frosted or black as indicated.

C. **Reinforced Polyethylene Sheet:** Where plastic sheet constitutes the only barrier between the Work Area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick, frosted or black as indicated.

2.3 MISCELLANEOUS MATERIALS:

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

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

C. **Wetting Materials:** For wetting prior to disturbance of ACM use either amended water or a removal encapsulate:

1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM 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 solution of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

2. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM 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 solution of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.

D. **Encapsulants.** As specified in Section 09805 or as approved by Owner's Representative based on submittals from abatement contractor.

E. **Garden Sprayer:** Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure.

PART 3 - EXECUTION

3.1 GENERAL:

A. **Before Start of Work:** Complete the following before start of work of this section:

1. 01527 Regulated Areas

3.2 WORKER PROTECTION:

A. 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.

3.3 GLOVE BAGS:

A. **Complete requirements** of the following:

1. 01562 Respiratory Protection

2. 01561 Worker Protection - Repair and Maintenance (as applicable)
3. 01560 Worker Protection –Asbestos Abatement (as applicable)

B. Glovebag: Remove ACM inside a glove bag according to the following procedure:

1. Use at least two persons to perform glovebag removals operations.

2. Use each glovebag only once

3. Do not move glovebag once it has been mounted in place.

4. Do not use glovebag on surface whose temperature exceeds 150°F.

5. Check materials adjacent to locations where glovebag will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6-mil plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove bag will be attached.

6. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter) and allow additional so that the top of the glove bag will be clear of the pipe after installation.

7. Place necessary tools into pouch located inside glove bag. This will usually include: bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-wetted cloth.

8. Place a strip of duct tape along both edges of the open top slit of glove bag for reinforcement.

9. Place the glove bag around section of pipe to be worked on and staple top together through reinforcing duct tape. Staple down sides approximately 6 inches so that top of the glove bag is clear of pipe. Seal top and sides with duct tape. Next, duct tape the ends of glove bag to pipe itself, where previously covered with plastic or duct tape.

10. Install glovebag so that it completely covers the circumference of pipe or other structures where the work is to be done.

11. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and re-test.

12. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage.

13. Thoroughly wet material to be worked on with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate.

14. One person places their hands into the long-sleeved gloves while the second person directs garden sprayer at the work.

15. Use bone saw, if required, to cut insulation at each end of the section to be removed. A bone saw is a serrated heavy gauge wire with ring-type handles at each end. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum.

16. Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping.

17. Rinse all tools with water inside the bag and place back into pouch.

18. Using scrub brush, rags and water, scrub and wipe down the exposed pipe.

19. Thoroughly wash and wipe down interior of glovebag to a point below the location where the bag will be twisted and taped to seal waste in bottom of bag.

20. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.

21. Remove the vacuum nozzle, twist water sleeve closed and seal with duct tape.

22. From outside the bag, pull the tool pouch away from the bag. Place duct tape over twisted portion and then cut the tool bag from the glove bag, cutting

through the twisted/taped section. Contaminated tools may then be placed directly into next glove bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste.

23. With removed insulation in the bottom of the bag, twist the bag several times and tape it to seal material in the bottom during removal of the glove bag from the pipe.

24. Slip a 6-mil disposal bag over the glove bag (still attached to the pipe). Remove tape or cut bag and open the top of the glove bag and fold it down into disposal bag.

25. Clean all surfaces in the Work Area using disposable cloths wetted with water with surfactant or removal encapsulate added. When these surfaces have dried, clean with a HEPA filtered vacuum. Material adhered to a surface with removal encapsulate may require the application of additional removal encapsulate to facilitate cleaning.

26. Seal exposed ends of remaining pipe insulation.

27. Remove disposable suits and place these into bag with waste.

28. Collapse the bag with a HEPA vacuum twist top of bag, seal with at least 3 wraps of duct tape, bend over and seal again with at least 3 wraps of duct tape.

3.4 MINI-ENCLOSURES:

A. **A mini enclosure** is a small walk-in enclosure which accommodates no more than two persons. Provide a fabricated or job-made enclosure constructed of 6-mil plastic or equivalent. Place the enclosure under negative pressure by means of a HEPA filtered ventilation unit.

B. **Provide a remote personnel decontamination unit** meeting requirements of Section 01563 “Decontamination Units” for worker decontamination.

C. **Sequence of Work:** Before beginning work of this sub-section complete the following:

1. Isolation of area in accordance with Section 01527 “Regulated Area” or Section 01526 “Temporary Enclosures”.

2. Construction of a personnel decontamination unit in accordance with Section 01563 Decontamination Units.

D. **Work Room:** Construct Work Room in the same manner as a Primary Barrier fabricated from 6-mil sheet plastic. Arrange so that Primary Barrier provides both a Critical and Primary Barrier. Line walls and floor of Work Room with a continuous Secondary Barrier.

E. **Change Room:** Provide an approximately 3 feet by 3 feet Change Room, with additional space as required for storage, attached to each Work Room. Fabricate Change Room from 6-mil sheet plastic in the same manner as a Primary Barrier. Locate so that access to Work Area is though Change Room.

F. **Step Off Area:** Cover floor in front of entry to Change Room with one layer of 6-mil sheet plastic. Securely anchor sheet plastic to prevent slipping.

G. **Flapped Door Construction:** Provide flapped door as entry to Change Room and entry from Change Room to Work Room. Fabricate each flapped door from overlapping contacting layers of sheet plastic. Fasten each layer on the top and one side. Each flap is to be 3 inches longer than door opening. Reinforce free side and bottom of each sheet with duct tape. Alternate sides that are fastened on each layer. Form arrows pointing to entry side from duct tape on inside and outside of door.

H. **Signage:** At entry to Change Room post an approximately 20 inch by 14 inch manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend

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

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

I. **Complete requirements** of the following:

1. Section 01560 Worker Protection - Asbestos Abatement

2. Section 01562 Respiratory Protection

3. Section 01513 Temporary Pressure Differential & Air Circulation System: HEPA filtered vacuum cleaner with vacuum in space outside Mini-Enclosure may be used for compliance with this section. Provide a minimum of 8 air changes per hour in the Work Room.

J. **Testing:** The mini-enclosure shall be inspected for leaks and smoke tested to detect breaches, and breaches sealed.

K. **Entry to Work Room:** Require that any time a worker enter the Work Room the following procedure is followed.

1. Outside of Change Room remove all street clothes and don clean coveralls and respirator. A swimsuit or second disposable suit may be worn beneath outer coveralls.

2. Enter Change Room be sure that entry is completely closed.
3. Enter Work Room be sure that entry is completely closed.

L. **Work Procedures:** Arrange work area within the mini-enclosure so that during use air movement is directed away from the worker's breathing zone.

Pre-formed Pipe Insulation: Remove pre-formed pipe insulation either air cell (corrugated paper), plaster, or millboard (layered cardboard) using the following procedures:

HEPA-vacuum the work site.

Wet surface with amended water or removal encapsulant.

Air Cell (corrugated paper type): Use a hand pump garden sprayer to inject amended water or removal encapsulant into the corrugations of the insulation. Push the nozzle halfway through the insulation and inject amended water or removal encapsulant until it begins to run out the joints on either end of the section of insulation.

Plaster and Mill board: Inject amended water in lateral and annular joints until water runs out both ends of section.

Allow the amended water or removal encapsulant to soak in. If the insulation is the consistency of moist putty it may be removed, otherwise inject more amended water or removal encapsulant and wait for it to soak in.

Slit jacket of the insulation at both lateral and annular joints, cut metal bands and lower into an asbestos disposal bag held open below the pipe.

Clean the exposed pipe with wet decontamination procedures as specified in section 01712. Dispose of the rags or paper towels in the disposal bag used above.

Collapse the bag with a HEPA-vacuum, twist-top of bag, seal with at least 3 wraps of duct tape, bend over and seal again with at least 3 wraps of duct tape. ("Goose Neck")

Seal exposed ends of remaining pipe insulation in accordance with Section 15254.

Job Molded Plaster Fitting Insulation: Thoroughly wet with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate.

Other material specific procedures will be addressed in Section 01013 as well as the pre bid meeting.

M. Worker Decontamination: Require that any time a worker leaves the mini-Enclosure the following procedure be followed.

1. Maintain a bucket of clean potable water in the Work Area. Do not amend with a wetting agent.

2. Remove contaminated suit inside the Work Area. Leave respirator in place.

3. Wash hands, face and surface of respirator with water and wet paper towels. Use caution to avoid breaking seal between respirator face-piece and face.

4. Proceed with respirator in place to Change Room.

5. Be sure that entry to Work Area is completely closed.

6. In Change Room do clean disposable suit leaving respirator in place.

7. Exit change room be sure that entry to Change Room is completely closed. Proceed to next Mini-Enclosure, or a remote shower.

8. At end of workday decontaminate fully in accordance with procedures in appropriate specification section describing Worker Protection.

N. Material Decontamination: Require that the following procedure be used in removing equipment and bagged debris from the Work Room.

1. Three workers are required. One in the Work Room, one in the Change Room, and one on Step Off Area.

2. Equipment and bagged debris are to be removed from the Mini-Enclosure in separate operations.

3. Worker in Work Room cleans equipment and bagged debris and hands one piece of equipment or one bag of debris at a time to worker in Change Room.

4. Worker in Change Room wet cleans each piece of equipment or bag and stores them in Change Room. Equipment is sealed completely in 6-mil sheet plastic in the Change Room.

5. When the amount of stored material in the Change Room becomes large enough that the worker cannot clean incoming material without contacting previously cleaned material the door between the Work and Clean Room is closed.

6. The worker in the Changing Room then passes each item into a new disposal bag held open in the doorway between the Changing Room and Step Off Area by the worker on the Step Off Area. The Worker on the Step Off Area places each bag in a sealed cart for transport to the load out area. No bags are to be stored outside of the Mini-Enclosure.

7. All bags are to be transported through the building in clean sealed containers that have never been in a asbestos Work Area, Mini-Enclosure or decontamination unit.

O. Mini-Enclosure Decontamination: At completion of all work decontaminate the Work and Changing Rooms as set forth in Section 01711 Project Decontamination for non-friable materials.

END OF SECTION - 01529

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01560 - WORKER PROTECTION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Respiratory Protection:** is specified in Section 01562.

1.4 WORKER TRAINING:

A. **AHERA Accreditation:** All workers are to be accredited as Abatement Workers as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

B. **State and Local License:** All workers are to be trained, certified and accredited as required by State of Delaware & / or local code or regulation, as required.

C. **Training - Class I:** Train in accordance with 29 CFR 1926.1101. Provide training for all workers who will perform Class I operations that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C). Include but do not limit the topics covered in the course to the following:

1. Methods of recognizing asbestos
2. Health effects associated with asbestos
3. Relationship between smoking and asbestos in producing lung cancer

4. Nature of operations that could result in exposure to asbestos

5. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
    a. Engineering controls
    b. Work practices
    c. Respirators

    d. Housekeeping procedures
    e. Hygiene facilities
    f. Protective clothing
    g. Decontamination procedures
    h. Emergency procedures
    i. Waste disposal procedures

6. Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1910.134 and 1926.58 Table D-4

7. Appropriate work practices for the work

8. Requirements of medical surveillance program

9. Review of 29 CFR 1926

10. Pressure Differential Systems

11. Work practices including hands on or on-job training

12. Personal Decontamination procedures

13. Air monitoring, personal and area

1.5 MEDICAL SURVEILLANCE:

A. Provide a medical surveillance program for all employees who are:

1. engaged in Class I, II and III work for a combined total of 30 or more days per year or,

2. are exposed at or above the permissible exposure limit or excursion limit (0.1 f/cc or greater for an 8 hour time weighted average).

3. before an employee can be assigned to work requiring use of a respirator.

B. **Provide a medical surveillance program** and physician opinion before a respirator is assigned as required by 29 CFR 1910.134 and 29 CFR 1926.103(e)(10)

C. **Provide medical examination** that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individuals ability to work in environments capable of producing heat stress in the worker.

1.6 SUBMITTALS:

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

1. **AHERA Accreditation:** Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

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

4. **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:

a. Name and Social Security Number

b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure (29 CFR 1926.1101(m)).

f. A legible typed version of the physician’s name, the physician’s signature, and date of examination.

g. 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.

4. 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

2.1 PROTECTIVE CLOTHING:

A. General. Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM or PACM.

B. **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.

C. **Hard Hats:** Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner's Representative, Project Administrator, and Owner. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean, decontaminate and bag hats before removing them from Work Area at the end of the work.

D. **Goggles:** Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.

E. **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.

2.2 ADDITIONAL PROTECTIVE EQUIPMENT:

A. Respirators, Disposable coveralls, head covers, and footwear covers and respirators shall be provided by the Contractor for the Owner, Owner’s Representative, Project Administrator, and other authorized representatives who may inspect the job site. Provide six (6) complete coveralls per day. Provide two (2) respirators, and up to six (6) respirator filter changes per day.

PART 3 - EXECUTION

3.1 GENERAL:

A. 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.

B. 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.

3.2 DECONTAMINATION PROCEDURES:

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

1. 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:

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

b. 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:

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

d. 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.

e. 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.

f. Carefully wash facepiece of respirator inside and out.

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

a. Shower completely with soap and water.

b. Rinse thoroughly.

c. Rinse shower room walls and floor prior to exit.

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

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

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

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

c. Thoroughly wet body from neck down.

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

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

f. Dispose of wet filters from air purifying respirator.

g. Carefully wash facepiece of respirator inside and out.

h. Shower completely with soap and water.

i. Rinse thoroughly.

j. Rinse shower room walls and floor prior to exit.

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

B. Remote Shower: The procedures above are to be used if the decontamination facility is used as a remote shower. If a worker cannot gain direct access to the Equipment Room require that he enter Decontamination Unit and proceed directly through Shower Room to Equipment Room. Decontamination procedure is then completed as required above.

C. Within Work Area:

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

3.3 CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT:

Following this section is a Certificate of Worker Training. 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 - 01560

BATTA ENVIRONMENTAL ASSOCIATES, INC.

CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT

PROJECT NAME_____ DATE_____

PROJECT ADDRESS_____

CONTRACTOR'S NAME_____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. This training must have been the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

*Topics covered in the course must have included the following:

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of protective equipment
- Pressure Differential Systems
- Work practices including hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

Signature_____Social Security No_____

Printed Name_____Witness_____

SECTION 01561 - WORKER PROTECTION-REPAIR AND MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **This section describes** the equipment and procedures for protecting workers against asbestos contamination and other workplace hazards, except for respiratory protection, where asbestos fibers are collected at the point of generation so that contamination of workers is unlikely.

B. **This section applies** only where the airborne fiber counts as measured in accordance with 29 CFR 1926.1101 are below 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) and the excursion limit of 1.0 f/cc.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Respiratory Protection:** is specified in Section 01562.

B. **Worker Protection:** for asbestos abatement work where workers will be in areas that contain or may contain airborne fiber counts measured in accordance with 29 CFR 1926 above 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) or above 1.0 fibers per cubic centimeter for a 30 minute Excursion Limit (EL) is specified in Section 01560.

1.4 DESCRIPTION OF REQUIREMENTS:

A. **Worker protection requirements** of this section are appropriate for asbestos maintenance and repair work. This differs from asbestos abatement in that the work is not performed in an asbestos-fiber-contaminated area. As such, the worker decontamination procedures are carried out with a HEPA-filtered vacuum cleaner rather than a shower facility.

B. **Requirements** of this section apply only when work is being performed in accordance with the limitations and requirements of the following sections of this specification:

1. 01527 Regulated Areas

2. 01528 Entry Into Controlled Areas

3. 01529 Mini Enclosures and Glovebags for glovebag work.
4. 01712 Cleaning and Decontamination Procedures
5. 02083 Disturbance of ACM During O&M Work
6. 15254 Repair of Insulation and Lagging

C. **When the work** being performed is governed under any other specification section or required by any of the above sections or during work in a mini-enclosure the requirements of Section 01560 Worker Protection - Asbestos Abatement apply.

1.5 WORKER TRAINING:

A. **AHERA Accreditation:** All workers are to be accredited as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

B. **State and Local License:** All workers are to be trained, certified, accredited, or licensed as required by State of Delaware or local code or regulation.

C. **Training:** Provide training for all workers that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

1.6 MEDICAL EXAMINATIONS:

A. **Provide a medical surveillance program** for all employees who are engaged in Class I, II and III work for a combined total of 30 or more days per year or are exposed at or above the permissible exposure limit or excursion limit. A medical exam also is required before an employee can be assigned to work requiring the use of a respirator.

1. For the purposes of this paragraph, any day in which a worker engages in Class II or Class III work or a combination thereof for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in the OSHA standard (29 CFR 1926.1101) is not counted.

B. **Provide a medical surveillance program** and physicians opinion before a respirator is assigned as required by 29 CFR 1910.134 and 29 CFR 1926.103(e)(10).

C. **Provide medical examination** that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an

evaluation of the individuals ability to work in environments capable of producing heat stress in the worker.

1.7 SUBMITTALS:

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

1. **AHERA Accreditation:** Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

3. **Historic Airborne Fiber Data:** Submit airborne asbestos fiber count data from an independent air monitoring firm to verify that work procedures will result in an airborne fiber level as measured in accordance with 29 CFR 1926 below 0.1 fibers per cubic centimeter as an 8 hour Time Weighted Average (TWA). Include at least the following data for each procedure required by the work:

   a. Date of measurements

   b. Operation monitored

   c. Sampling and analytical methods used and evidence of their accuracy

   d. Number, duration, and results of samples taken

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

5. **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:

a. Name and Social Security Number

b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.

f. A legible typed version of the physicians name, the physicians signature, and date of examination.

6. 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

2.1 PROTECTIVE CLOTHING:

A. General. Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM or PACM.

B. 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. Dispose of coverall as asbestos waste at completion of all work.

C. **Additional Protective Clothing:** Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.

D. **Cold Weather Gear:** Provide each worker with an insulated jacket, pants, gloves, and hat. Require that cold weather gear be removed in Equipment Room of Personnel Decontamination Unit. Dispose of cold weather gear as asbestos waste at completion of all work.

E. **Hard Hats:** Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Owner's Representative, Project Administrator, and Owner. Label hats with same warning labels as used on disposal bags. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Hats shall be thoroughly cleaned and decontaminated before being worn from one Work Area to another. At the end of the work, clean and decontaminate hats and bag for storage in a properly labeled asbestos disposal bag.

F. **Goggles:** Provide eye protectives (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Goggles shall be thoroughly cleaned and decontaminated before being worn from one Work Area to another. At the end of the work, clean and decontaminate goggles and bag for storage in a properly labeled asbestos disposal bag. Full face respirators are an acceptable substitute.

G. **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. Dispose of as asbestos contaminated waste at the end of the work.

H. **Hearing Protection:** Provide hearing protection as required by OSHA for all workers using noisy equipment or working in noisy environments. Thoroughly clean and decontaminate headset or ear-muff type hearing protectors and reusable ear stopples before they are worn from one Work Area to another or at the end of work. Dispose of disposable ear stopples before leaving work area and provide new ear stopples at each work area.

PART 3 - EXECUTION

3.1 GENERAL:

A. **Work and Decontamination** procedures involve a person in the work area on the plastic sheet and one off the sheet. The person on the sheet carries out the work and never leaves the sheet until the work is complete and dry decontamination procedures are completed. The person off the sheet supplies materials to and accepts material from the on-sheet person. The off sheet person never enters the Work Area. If the work involves more than one person then the team shall consist of two (or more) on-sheet persons and one off-sheet person.

B. **Do not eat, drink, smoke**, chew gum or tobacco, or apply cosmetics in the Work Area. To eat, drink, chew, or smoke, workers shall follow the procedures described below and leave the Work Area.

C. **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.

3.2 AIR MONITORING:

A. **Monitor Air** as follows at all times that the work is going on:

1. **Personal Air Samples:** Collect a personal air sample on the on-sheet person at all times that work is being carried out. Collect samples between two (2) liters per minute for the entire time that work is being carried out. Use cellulose ester filters with 0.8 to 1.2 micron pore size to collect samples.

2. **Area Samples:** Collect one area sample in each secure area during or at completion of the work. Collect a 600 - 3000 liter sample at a maximum pumping rate of 10 liters per minute. Use cellulose ester filters with 0.8 to 1.2 micron to collect samples.

B. **Transmit Samples** to Owner's testing laboratory for analysis. Owner will provide a copy of all air monitoring data to the Contractor.

3.3 RESPIRATORS:

A. **Instruct and train** each worker in proper respirator use and require that each worker always wear a respirator, properly fitted on the face, in the Work Area.

3.4 COVERALLS:

A. **At the Start of Each Work Shift:** Put on new disposable coveralls, new head covers, new footwear covers over street shoes, and put on a clean respirator.

B. **All workers shall wear** disposable, full-body coveralls and disposable head and footwear covers in the Work Area.

C. **Follow procedures** under "Dry Decontamination" whenever leaving a Work Area.

3.5 ADDITIONAL PROTECTIVE EQUIPMENT:

A. **At the work site** maintain 2 complete sets of protective equipment including disposable coveralls, head covers, and footwear covers for use by the Owner's Representative or the Owner.

3.6 DECONTAMINATION PROCEDURES:

A. **Require all Workers** to adhere to the following personal decontamination procedures whenever they leave the Work Area or at end of work shift:

1. **Dry Decontamination:** Complete the following before leaving any Regulated Area, only if no visible contamination is observed on the protective clothing. Otherwise follow wet decontamination procedures found in Section 01560.

   a. Each person HEPA vacuums thoroughly the other person. Use brush attachment on the HEPA vacuum.

   b. While still wearing respirator each person removes their disposable suit, turning it inside out while removing it. Roll up suit and pack in hood.

   c. Place suits in a disposal bag.
   d. Suck air out of bag with HEPA vacuum.

   e. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.

2. **End Of Shift:** Require that each worker decontaminate according to the following procedure at the end of the days work or before removing respiratory protection.

   a. Each person HEPA vacuum hands, hair, face, and respirator.

   b. Each person HEPA vacuum area of respirator seal to face on the other person.

c. Remove respirator and, HEPA vacuum face at respirator seal and all surfaces of the respirator. HEPA vacuum any parts of hair or head covered by respirator straps.

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

e. Wash respirator face piece inside and outside.

f. At completion of above, thoroughly wash face and hands with soap and water.

g. Require that each worker follow the wet decontamination procedures set forth in Section 01560 at the end of each day's work before changing into street clothing.

3.7 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT:

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

END OF SECTION - 01561

BATTA ENVIRONMENTAL ASSOCIATES, INC.

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME_____ DATE_____

PROJECT ADDRESS_____

CONTRACTOR'S NAME_____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained at a course the equivalent in curriculum and training method to the 40-hour EPA approved Asbestos Worker's course developed by EPA for activities that will result in the disturbance of ACM. [40 CFR 763.92]. This course must have included "hands-on" training in the use of respiratory protection and work practices and shall take at least 40 hours.
Topics covered in the course must have included the following:

a. Physical characteristics of asbestos
b. Health hazards associated with asbestos
c. Respiratory protection
d. Use of protective equipment
e. Pressure Differential Systems
f. Work practices including hand on or on-job training
g. Personal decontamination procedures
h. Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

Signature_____Social Security No_____

Printed Name_____Witness_____

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01562 - RESPIRATORY PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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

1.3 DEFINITIONS:

A. "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.

B. "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.

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

1.4 STANDARDS:

A. **Except to the extent** that more stringent requirements are written directly into the Contract Documents, the latest edition of the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published

copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.

1. **OSHA** U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards Section 29 CFR 1910.1001, Section 1910.134, and Section 29 CFR 1926.1101.

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

3. **CSA** Canadian Standard Association, Rexdal, Ontario, Standard Z180.1, "Compressed Breathing Air".

4. **ANSI** American National Standard Practices for Respiratory Protection, ANSI Z88.2.

5. **NIOSH** National Institute for Occupational Safety and Health
NIOSH Respirator Decision Logic (May 1987) DHHS/NIOSH Publication No. 87-108;
NIOSH/EPA, "A Guide to Respiratory Protection for the Asbestos Abatement Industry" EPA-560-OPTS-86-001 (September 1986);
42 CFR 84, NIOSH Standard for Certification of Non-Powered Air Purifying Respirator filters;
30 CFR 11, NIOSH - Certification of Respirators

6. **MSHA** Mine Safety and Health Administration

1.5 SUBMITTALS:

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

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

2. **System Diagram:** When a 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.

3. **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.

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

5. **Resume information:** Submit resume and information on training for individual monitoring the operation of supplied air respiratory systems. Submit training certifications where applicable.

1.6 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS:

A. **Provide air** used for breathing in supplied air respiratory systems that meets or exceeds standards set for C.G.A. type 1 (Gaseous Air) Grade D:

1.7 ALLOWABLE CONTAMINANTS:

A. **Supply air** that has an asbestos concentration no greater than outside ambient conditions.

B. **Supply air** that meets the level of contaminants allowed according to the air quality standard specified.

C. **The following table** sets forth the quantity of any given contaminant allowed according to the referenced standards:

CONTAMINANT	CGA Type 1 (Gaseous Air) Grade D	Grade E	Grade H	CSA Z180.1
Carbon Monoxide, PPM/v	20	10	5	5
Carbon Dioxide, PPM/v	1000	500	500	500
Condensed Hydrocarbons, mg./cu. meter	5	5		1
Gaseous Hydrocarbons - as methane, PPM/v			10	25
Water Vapor - PPM/v	(1)	(1)	(1)	27
dewpoint	-50F	-50F	-50F	-63F
Objectionable Odors	None	None	None	None
Nitrogen Dioxide, PPM/v	-	-	0.5	0.2
Nitrous Oxide, PPM/v	-	-	-	5
Sulfur Dioxide, PPM/v	-	-	0.5	-
Halogenated solvents, PPM/v	-	-	1	-

Other gaseous contaminants	-	-	-	(2)
Inorganic particulates, mg./cu. meter	-	-	-	1

- Indicates that the standard shows no limiting characteristics

(1) The CGA standards do not indicate a specific moisture limit when the ambient temperature is above freezing. However, since a moisture content no greater than a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint (66 PPM/v) is necessary for carbon monoxide elimination, the CO limits could not be met unless the air were dried to a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint or better.

(2) Maximum allowable content of trichlorotrifluoroethane, dichlorodi-fluoromethane, and chlorodifluoromethane is 2 PPM/v for each. Unlisted contaminants shall not exceed one-tenth of the Threshold Limit Values (TLV's) for Chemical Substances in Workroom air adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

1.8 DELIVERY:

A. Deliver replacement parts, etc., not otherwise labeled by NIOSH or MSHA to job site in manufacturer's containers.

PART 2 - EQUIPMENT

2.1 AIR PURIFYING RESPIRATORS

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

B. Filter Cartridges: Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with 42 CFR Part 84 and ANSI Z228.2. Also, additional cartridge sections may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.

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

2.2 SUPPLIED AIR RESPIRATOR SYSTEMS:

A. **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.

B. **Facepiece and Hose:** Provide full facepiece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure facepiece.

C. **Auxiliary backup system:** In atmospheres which contain sufficient oxygen (greater than or equal to 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator equipped with an emergency back up HEPA filter.

D. **Escape air supply:** In atmospheres which are oxygen deficient (less than 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator incorporating an auxiliary self contained breathing apparatus (SCBA) which automatically maintains an uninterrupted air supply in pressure demand mode with a positive pressure face piece.

E. **Backup air supply:** Provide a reservoir of compressed air located outside the Work Area which will automatically maintain a continuous uninterruptable source of air automatically available to each connected facepiece 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.

E. **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:

1. Compressor shut down or other fault requiring use of backup air supply

2. Carbon Monoxide (CO) levels in excess of 5 PPM/V

G. **Carbon Monoxide (CO) Monitor:** Continuously monitor and record on a strip chart recorder 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".

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

1. Carbon Monoxide (CO) concentrations exceed 5 PPM/v in the air line between the filter bank and backup air supply

2. Compressor temperature exceeds normal operating range

I. **Compressor Location:** Locate compressor outside of building in location that will not impede access to the building, and that will not cause a nuisance by virtue of noise or fumes to occupied portions of the building.

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

K. **After-Cooler:** Provide an after-cooler at entry to filter system which is capable of reducing temperatures to outside ambient air temperatures.

L. **Self Contained Breathing Apparatus (SCBA):** Configure system to permit the recharging of ⍰ hour 2260 PSI (15.58 MPa) SCBA cylinders.

PART 3 - EXECUTION

3.1 GENERAL:

A. **Respiratory Protection Program:** Comply with ANSI Z88.2 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.314 and 1926.103.

B. **Require** that respiratory protection be used at all times that there is any possibility of disturbance of ACM whether intentional or accidental.

C. **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 01714.

D. **Regardless of Airborne Fiber Levels:** Require that the minimum level of respiratory protection used be full face PAPRs with HEPA filters.

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

3.2 FIT TESTING:

A. **Initial Fitting:** Provide initial fitting of respiratory protection during a respiratory protection course of training set up and administered by an individual qualified to do fit testing. Fit types and sizes 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.

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

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

3.3 TYPE OF RESPIRATORY PROTECTION REQUIRED:

A. **General:** After reducing airborne asbestos levels to the lowest feasible level with engineering controls and work practices, provide respiratory protection as necessary to ensure that workers are not exposed to an airborne concentration of asbestos in excess of the Specified Permissible Exposure Limits (SPEL) set forth in this Section.

3.4 SPECIFIED PERMISSIBLE EXPOSURE LIMITS (SPEL):

A. **Specified Permissible Exposure Limits (SPEL):** Ensure that no worker is exposed to an airborne concentration of asbestos in excess of the Time-Weighted Average (TWA) limit, and Excursion Limit (EL) set forth below.

1. **Time Weighted Average (TWA) limit** - Concentration of airborne asbestos fibers to which any worker may be exposed as an eight (8) hour time-weighted average (TWA) shall not exceed 0.01 fibers per cubic centimeter

2. **Excursion Limit (EL)** – Concentration of airborne asbestos fibers to which any worker may be exposed as averaged over a sampling period of thirty (30) minutes shall not exceed 1.0 fibers per cubic centimeter

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

1. Electron Microscopy: If Electron Microscopy is used to determine airborne fiber levels, only asbestos fibers will be enumerated, but fibers of any size detected by the testing of Section 01711 Project Decontamination will be counted.

3.5 RESPIRATORY PROTECTION FACTOR:

A.	Respirator Type	Features	Protection Factor
1.	**Air Purifying: (APR-half)**	Negative pressure respirator High efficiency filter Half facepiece	10
2.	**Air Purifying: (APR-full)**	Negative pressure respirator High efficiency filter Full facepiece	50
3.	**Powered Air Purifying: (PAPR-half)**	Positive pressure respirator High efficiency filter Half facepiece	50
4.	**Powered Air Purifying: (PAPR-full)**	equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode. Full facepiece	1,000
5.	**Supplied air:**	Positive pressure respirator Pressure demand or other positive pressure mode Full facepiece Equipped with an auxiliary HEPA cartridge or positive pressure Self-contained breathing apparatus (SCBA) for escape	1,000

3.6 AIR PURIFYING RESPIRATORS:

A. **Powered air purifying - half or full face mask:** Supply a sufficient quantity of high efficiency respirator filters approved for asbestos so that workers can change filters at any time that flow through the facepiece 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.

3.7 SUPPLIED AIR RESPIRATOR:

A. **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. Assign an individual, trained by manufacturer of the equipment in use or by a Certified Industrial Hygienist, 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.

END OF SECTION - 01562

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01563 - DECONTAMINATION UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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

1.3 SUBMITTALS

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

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

2. Equipment Decontamination Unit: Provide shop drawing showing location and assembly of equipment decontamination units.

3. Shower Pan: Provide shop drawing.

4. Shower Walls: Provide product data.

5. Shower Head and Controls: Provide product data.

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

7. Hose Bib: Provide product data.

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

9. Elastomeric membrane: Provide product data when applicable.

10. Lumber: Provide product data on fire resistance treatment when applicable.

11. Sump Pump: Provide product data.

12. Signs: Submit samples of signs to be used.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6-mil thick, clear, frosted, or black as indicated.

B. **Flame Resistant Polyethylene Sheet:** Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick, frosted or black as indicated.

C. **Reinforced Polyethylene Sheet:** Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6-mil thick, frosted or black as indicated.

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

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

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

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

H. **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.

I. **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.

1. Primary Filter - Passes particles 20 microns and smaller

2. Secondary Filter - Passes particles 5 microns and smaller

J. **Hose Bib:** Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4 inch (19.05 mm) National Standard male hose outlet.

K. **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 feet x 3 feet square with minimum 6 feet high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4 feet 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.

L. **Elastomeric membrane:** Provide uniform flat sheets of flexible sheet roofing material fabricated from EPDM (ethylene propylene diene monomers) or Neoprene (polychloroprene), in a nominal 45 mil thickness.

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

N. **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 to pump. Adjust float switch so that a minimum of 3 inch remains between top of liquid and top of sump pan.

PART 3 - EXECUTION

3.1 PERSONNEL DECONTAMINATION UNIT:

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

B. **Clean Room/Drying Room** provides a clean room/drying room as a place for worker to dry after showering.

1. 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.

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

3. Separate this room from the Changing Room and Shower Room with airtight walls fabricated of 6-mil polyethylene.

4. Separate from Changing Room and shower room by a sheet of plastic flapped doorway, triple flapped.

5. Provide a continuously adequate supply of disposable bath towels.

C. **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.

1. Construct room by providing a shower pan and 2 shower walls in 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.

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

3. Separate this room from the Drying Room and Dirty Room with airtight walls fabricated of 6-mil polyethylene.

4. Provide splash proof entrances to Drying Room and Dirty Room with plastic flaps arranged so that water will not exit the shower area.

5. Provide shower head and controls.

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

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

8. Arrange so that water from showering does not splash into the Clean Room or Dirty Room.

9. 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.

10. Provide flexible hose shower head.

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

12. Provide hose bib.

13. Provide all other items indicated on contract drawings.

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

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

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

3. Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6-mil polyethylene.

4. Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

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

F **Decontamination Sequence:** Require that all workers adhere to the following sequence when entering or leaving the Work Area.

1. 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 Dirty Room.

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

3. Worker proceeds to Work Area.

G **Exiting Work Area:**

1. Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet.

2. The worker then proceeds to the Dirty Room and removes all clothing except respiratory protection equipment.

3. Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Dirty Room.

4. Disposable coveralls are placed in a bag for disposal with other material.

5. Require that Decontamination procedures found in Section 01560 be followed by all individuals leaving the Work Area.

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

3.2 EQUIPMENT DECONTAMINATION UNIT:

A. **Provide an Equipment Decontamination Unit** consisting of a serial arrangement of rooms, Clean Room, 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.

B. **Wash Room:** provide Wash Room for cleaning of bagged or containerized asbestos-containing waste materials passed from the Work Area, with an enclosed Shower Unit located just outside the Work Area as an equipment, bag and container cleaning station.

1. Fabricate waterproof floor extending 6 feet beyond Wash Down station in all directions. Install seamless waterproof membrane over area and extend over curbs on all four sides. Form curbs from 2 inch x 4 inch lumber laid on the flat.

2. Waterproof membrane is to be fabricated from polyethylene or elastomeric.

3. Do not allow water to collect on waterproof membrane. Remove continuously with a wet vacuum or mops.

4. Construct wash room of nominal 2 inch x 4 inch wood framing and polyethylene sheeting, at least 6-mil in thickness and located so that packaged materials, after being wiped clean, can be passed to the Holding Room.

6. Separate this room from the Work Area by a single flapped door of 6-mil polyethylene sheeting.

7. Provide a drop cloth later 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 two (2) layers of plastic at all times. Use only clear plastic to cover floors.

C. Clean Room: Provide Clean Room to isolate the Holding Room from the building exterior. If possible locate to provide direct access to the Holding Room from the building exterior.

1. Erect Critical and Primary barriers as described in Section 01526 "Temporary Enclosures" in an existing space. If no space exists construct Clean Room of 2x4 wood framing and polyethylene sheeting, at least 6-mil in thickness.

2. Separate this room from the exterior by a single flap door of 6 mil polyethylene sheeting.

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

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

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

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

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

5. Workers from the building exterior enter Holding Area and remove decontaminated equipment and/or containers for disposal.

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

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

3.3 CONSTRUCTION OF THE DECONTAMINATION UNITS:

A. **Walls and Ceiling:** Construct airtight walls and ceiling using polyethylene sheeting, at least 6 mil in thickness. Attach to existing building components or a temporary framework.

B. **Floors:** Use 2 layers (minimum) of 6-mil polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.

C. **Flap Doors:** Fabricated from three (3) overlapping sheets with openings a minimum of three feet (3') wide. Configure so that sheeting overlaps adjacent surfaces. Weights at bottom of sheets 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.

D. **If the Decontamination area** is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/2 inch plywood "ceiling" with polyethylene sheeting, at least 6-mil in thickness covering the top of the "ceiling".

E. **Visual Barrier:** Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6-mil in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/4 inch thick hardboard or 1/2 inch plywood. Where the solid barrier is provided, sheeting need not be opaque.

F. **Alternate methods** of providing Decontamination facilities may be submitted to the Owner’s Representative for approval. Do not proceed with any such method(s) without written authorization of the Owner’s Representative.

G. **Electrical:** Provide sub-panel at Changing Room to accommodate all removal equipment. Power sub-panel directly from a building electrical panel.

1. Connect all electrical branch circuits in Decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.

3.4 CLEANING OF DECONTAMINATION UNITS:

A. **Clean debris and residue** from inside of Decontamination Units on a daily basis or as otherwise indicated on Contract Drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

B. **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.

3.5 SIGNS:

A. **Post** an approximately 20 inch by 14 inch manufactured caution sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

1. Provide signs in both English and Spanish.

2. Legend:

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

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

B. **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:

1. Provide signs in both English and Spanish.

2.

Legend	**Notation**
NO FOOD, BEVERAGES OR TOBACCO PERMITTED	3/4 inch Block

ALL PERSONS SHALL DON PROTECTIVE CLOTHING (COVERINGS) BEFORE ENTERING THE WORK AREA	3/4 inch Block
ALL PERSONS SHALL SHOWER IMMEDIATELY AFTER LEAVING WORK AREA AND BEFORE ENTERING THE CHANGING AREA	3/4 inch Block

END OF SECTION - 01563

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01601 - MATERIALS AND EQUIPMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. **Related Sections:** The following Sections contain requirements that relate to this Section:

1. The Contractor's Construction Schedule is included under Section 01043 Coordination - Asbestos Abatement.

2. The Contractor's Schedule of Submittals is included under Section 01301 Submittals - Asbestos Abatement.

3. The applicability of industry standards to products specified is included under Section 01097 reference standards and definitions – asbestos abatement.

4. The administrative procedures for handling requests for substitutions made after award of the Contract is included under Section 01632 Substitutions - Asbestos Abatement.

1.3 DEFINITIONS

A. **Definitions** used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term

"product" includes the terms "material," "equipment," "system," and terms of similar intent.

2. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

3. "Foreign Products" as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

4. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

5. "Equipment" are products that may be either operational or fixed.

a. Operational Equipment are products with operating parts, whether motorized or manually operated, that requires temporary or permanent service connections, such as wiring or piping.

b. Fixed Equipment are products necessary for accomplishing the work that are used as a temporary facility during the work and removed afterward.

1.4 SUBMITTALS

Required submittals: A general listing of products requiring submittals is included at the end of Section 01301 "Submittals." This listing may not be complete. Submittal requirements are found in each specification section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

A. **Product List:** Prepare a list showing products specified in tabular form acceptable to the Owner's representative. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Form: Prepare product list with information on each item tabulated under the following column headings:

a. Related Specification Section number.

b. Generic name used in Contract Documents.

c. Proprietary name, model number, and similar designations.

d. Manufacturer's name and address.

e. Supplier's name and address.

f. Installer's name and address.

g. Projected delivery date or time span of delivery period.

3. Owner’s Representative's Action: The Owner’s Representative will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Owner’s representative's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. **General Product Requirements:** Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

1. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. **Product Selection Procedures:** The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Semi-proprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.

a. Where Specifications specify products or manufacturers by name, accompanied by the term "or equal" or "or approved equal," comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. **Comply with manufacturer's instructions and recommendations** for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION 01601

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01632 - SUBSTITUTIONS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. **Related Sections:** The following Sections contain requirements that relate to the Section:

1. **Division 1 Section Reference Standards and Definitions - Asbestos Abatement** specifies the applicability of industry standards to products specified.

2. **Division 1 Section Coordination - Asbestos Abatement** specifies requirements for submitting the Contractors Construction Schedule.

3. **Division 1 Section Submittals - Asbestos Abatement** specifies requirements for submitting the Submittal Schedule.

4. **Division 1 Section Materials and Equipment - Asbestos Abatement** specifies requirements governing the Contractors selection of products and product options.

1.3 DEFINITIONS

A. **Definitions** in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. **Substitutions:** Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following

are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.

2. Revisions to the Contract Documents requested by the Owner or Owner's Representative.

3. Specified options of products and construction methods included in the Contract Documents.

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

1.4 SUBMITTALS

A. Substitution Request Submittal: The Owner's Representative will consider requests for substitution if received within 3 weeks prior to commencement of the Work. Requests received less than 3 weeks before commencement of the Work may be considered or rejected at the discretion of the Owner's Representative.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.

2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.

3. Provide complete documentation showing compliance with the requirements for substitutions and the following information, as appropriate:

a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.

b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.

c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.

d. Samples, where applicable or requested.

e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.

f. Cost information, including a proposal of the net change, if any in the Contract Sum.

g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.

h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Owner’s Representative's Action: If necessary, the Owner’s Representative will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Owner’s Representative will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.

a. Use the product specified if the Owner’s Representative cannot make a decision on the use of a proposed substitute within the time allocated.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Conditions: The Owner’s Representative will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Owner’s Representative. If the following conditions are not

satisfied, the Owner's Representative will return the requests without action except to record noncompliance with these requirements.

1. Extensive revisions to the Contract Documents are not required.

2. Proposed changes are in keeping with the general intent of the Contract Documents.

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

4. The specified product or method of construction cannot be provided within the Contract Time.

5. The Owner's Representative will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

6. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.

7. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Owner's Representative for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.

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

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

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

11. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

B. **The Contractor's submittal** and the Owner's Representative's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01632

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01701 - CONTRACT CLOSEOUT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section includes** administrative and procedural requirements for contract closeout including, but not limited to, the following:

1. Inspection procedures.
2. Project record document submittal.
3. Submittal of warranties.
4. Final cleaning.

B. **Closeout requirements** for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. **Preliminary Procedures:** Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.

a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

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

2. Advise the Owner of pending insurance changeover requirements.

3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.

4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.

6. Complete final cleanup requirements, including touch up painting.

7. Touch up and otherwise repair and restore marred, exposed finishes.

B. **Inspection Procedures:** On receipt of a request for inspection, the Owner's Representative will either proceed with inspection or advise the Contractor of unfilled requirements. The Owner's Representative will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued. This will form the initial 'punch-list' for final acceptance.

1. The Owner's Representative will repeat inspection when requested and assured that the Work is substantially complete.

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

1.4 FINAL ACCEPTANCE

A. **Preliminary Procedures:** Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.

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

3. Submit a certified copy of the Owner's Representative's final inspection list of items to be completed or corrected, endorsed and dated by the Owner's Representative. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Owner's Representative.

4. Submit a final liquidated damages settlement statement.

5. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

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

1. Upon completion of reinspection, the Owner's Representative will prepare a certificate of final acceptance. If the Work is incomplete, the Owner's Representative will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. **General:** Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Owner's Representative's reference during normal working hours.

B. **Record Drawings:** Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation and where ACM will be left (ex: elevator shaft, return air ducts, etc.) following abatement. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.

2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

3. Note related change-order numbers where applicable.

4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. **Record Specifications:** Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

3. Note related record drawing information and Product Data.

4. Upon completion of the Work, submit record Specifications to the Owner’s Representative for the Owner's records.

D. **Record Product Data:** Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.

2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3. Upon completion of markup, submit complete set of record Product Data to the Owner’s Representative for the Owner's records.

E. **Miscellaneous Record Submittals:** Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Owner's Representative for the Owner's records.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. **General:** The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls." The cleaning in this Section is in addition to cleaning which is part of decontamination work. This section is intended to return the facility to the Owner in presentable condition.

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

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

a. Remove labels that are not permanent labels.

b. Clean transparent materials, including mirrors and glass in doors and windows.

c. Replace chipped or broken glass and other damaged transparent materials.

d. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

e. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

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

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

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

1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01701

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01711 - PROJECT DECONTAMINATION

PART 1 - GENERAL

1.1 SUMMARY:

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

B. **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 work of Section 01526

2. Decontamination Unit erected by work of Section 01563

3. Pressure Differential System installed by work of Section 01513

C. **Work of This Section** includes the cleaning and decontamination of all surfaces (ceiling, walls, floor) of the work area, and all furniture or equipment in the work area.

1.2 RELATED DOCUMENTS:

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

1.3 DESCRIPTION OF REQUIREMENTS:

A. **General:** Decontamination of the Work Area following asbestos abatement.

B. **If the asbestos abatement work is on damaged or friable materials** the work is a four step procedure with two cleanings of the Primary Barrier plastic prior to its removal and two cleanings of the room surfaces to remove any new or existing contamination. Unless specifically indicated otherwise all materials are considered damaged or friable for purposes of this section.

C. **If the asbestos abatement work is on undamaged and non-friable materials** the decontamination procedure is a two step procedure with two cleanings of the Primary Barrier plastic to remove contamination, thus preventing contamination of the building when the Work Area isolation barriers are removed.

D. **In both cases** operation of the pressure differential system is used to remove airborne fibers generated by the abatement work.

1.4 RELATED WORK SPECIFIED ELSEWHERE:

A. **Removal of Gross Debris** is integral with the performance of abatement work and as such is specified in the appropriate work section(s) of these specifications:

1. Section 02081 Removal of Asbestos-Containing Materials

2. Section 02082 Removal of Asbestos-Contaminated Soil

3. Section 09805 Encapsulation of Asbestos-Containing Materials

1.5 SUBMITTALS:

A. **Before Start of Work** submit the following to the Owner’s Representative for review. Do not begin work until these submittals are returned with the Owner’s Representative's action stamp indicating that the submittal is returned for "Unrestricted Use" or "Final But Restricted Use".

1. Submit test report from an independent testing laboratory on the fire resistance rating of the assembly of the sprayback fireproofing on the lock-back sealer used.

B. **Before Start of Work** submit the following to the Owner’s Representative for review. Do not begin work until these submittals are returned with the Owner’s Representative's action stamp indicating that the submittal has been "Received".

1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:

a. "Lock-Back", sealer.

1.6 CLEAR AIR SAMPLING BY OWNER:

A. **To determine** if the elevated airborne asbestos structure concentration encountered during abatement operations has been reduced to the specified level, the Owner will secure samples and analyze them according to the following procedures.

1. Aggressive sampling procedures as described below will be followed.

2. PCM or TEM sampling will be performed depending on quantity of material.

3. Section 01013 “Summary of the work” will specify clearance criteria.

4. Work area Clearance: upon meeting the Clearance requirements the work of Section 01711 Project Decontamination can continue.

1.7 AGGRESSIVE SAMPLING BY THE OWNER:

A. **All Air Samples** will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower (electric motor) will be swept against all walls, ceilings, floors, ledges, and other surfaces in the room. This procedure will be continued for 5 minutes per 10,000 cubic feet of room volume.

2. One 20 inch diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 6 feet above floor, directed toward ceiling and operated at low speed for the entire period of sample collection.

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

4. After air sampling pumps have been shut off, fans will be shut off.

5. In work areas where dirt floor or exposed fibrous glass insulation is in the space, but outside the work area, maintain a critical barrier to prevent disturbance of these surfaces during aggressive sampling. Dirt floor crawl spaces will no be tested using Aggressive Techniques.

1.8 SCHEDULE OF CLEARANCE AIR SAMPLES BY OWNER:

A. Sample cassettes: Samples will be collected on 25 mm, cassettes with a conductive extension cowl as follows:

1. PCM: 0.8 micrometer mixed cellulose ester.

2. TEM: 0.45 micrometer mixed cellulose ester or 0.40 micrometer polycarbonate, with 5.0 micron mixed cellulose ester backing filter. Laboratory preparation of PCM samples should be such that they may be analyzed by both PCM and TEM methods.

B. Number and Volume of Samples: The number and volume of air samples given in the schedules is approximate. The exact number and volume of samples collected by the Owner or Owner's Representative may vary depending upon job conditions and the analytical method used.

C. Sampling sensitivity:

1. PCM: Based on a limit of detection (LOD) of 7 fibers/mm^2 on the filter (approximately 5 fiber counted in 100 fields) and 95% confidence limit, a sample volume of sufficient size that a single sample indicates compliance with the limit values given below. A sample must be at or below the LOD to indicate that it is at or below the limit value. Note: This is different from quantifying a concentration which is a stricter requirement and would need a larger sample volume.

2.

a. Clearance samples – a limit value of 0.01 f/cc.

3. TEM: Analytical Sensitivity as set forth in the analytical method used or the AHERA regulation.

D. PHASE CONTRAST MICROSCOPY:

1. **In each Work Area** after completion of all cleaning work, a minimum of 7 samples will be taken and analyzed as follows:

Location Sampled	Number of Samples	Detection Limit (Fibers/cc)	Approx. Volume (Liters)	Rate Liters / Minute
Each Work Area or	5	0.01	1,200 *	1-15
Each Room of Work Area	1 (5 minimum)	0.01	1,200 *	1-15
Work Area Blank	1	0.01	0	open for 30 Seconds
Laboratory Blank	1	0.01	0	Do Not Open

* Range of acceptable volume for each sample is 800 to 1,800 liters.

2. **Analysis:** Fibers on each filter will be measured using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, or the OSHA Reference Method (ORM) (29 CFR 1926.1101 Appendix A).

3. **Fibers:** referred to in this section include fibers regardless of composition as counted by the phase contrast microscopy method used.

4. **Split Sample:** One Work Area sample will be split and both halves analyzed separately for duplicate analysis (other quality control methods may be used at Owner's Representative's discretion.

5. **Release Criteria:** Decontamination of the work site is complete when every Work Area sample is at or below the Detection Limit above. If any sample is above the Detection Limit then the decontamination is incomplete and recleaning per section 01711 Project Decontamination is required.

E. TRANSMISSION ELECTRON MICROSCOPY:

A. **In each Work Area** after completion of all cleaning work, a minimum of 13 samples will be taken and analyzed as follows: (Note: Outside work area samples will be analyzed on an as-needed basis.)

Location Sampled	Number of Samples	Analytical Sensitivity Struct/cc	Min. Suggested Volume (Liters) *	Rate Liters/ Minute
Each Work Area	5	0.005	1,500	1-10
Outside each Work Area	5	0.005	1,500	1-10
Work Area Blank	1	0.005	0	Open for 30 Seconds
Outside Blank	1	0.005	0	Open for 30 Seconds
Laboratory Blank	1	0.005	0	Do Not Open

*Range of acceptable volume for each sample is 1,200 to 3,000 liters.

B. **Analysis** will be performed using the analysis method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

C. **Asbestos Structures** referred to in this Section include asbestos fibers, bundles, clusters or matrices, as defined by method of analysis.

D. **Release Criteria:** Decontamination of the work site is complete if either of the following two sets of conditions are met:

1. Work Area Samples are below filter background levels

   a. All Work Area sample volumes are greater than 1,200 liters for a 25 mm. sampling cassette.

b. The average concentration of asbestos of the five Work Area Samples does not exceed the filter background level of 70 structures per square millimeter of filter area.

2. Work Area Samples are not statistically different from Outside samples

a. All sample volumes except for blanks are greater than 560 liters for a 25 mm. sampling cassette.

b. The average asbestos concentration of the three blanks is below the filter background level of 70 structures per square millimeter of filter area.

c. Average asbestos concentrations in Work Area Samples are not statistically different from Outside samples, as determined by the Z-test calculation found in 40 CFR Part 763, Subpart E, Appendix A (Z is less that or equal to 1.65)

E. **If these conditions are not met** then the decontamination is incomplete, repeat the cleaning procedures of this section.

F. **Termination of Analysis:** if the arithmetic mean (average) asbestos concentration on the blank filters exceed 70 structures per square millimeter of filter area the analysis will cease and new samples collected.

1.9 LABORATORY TESTING

A. **The services of Batta Environmental Associates** will be employed by the Owner to perform PCM laboratory analysis of the air samples. A microscope and technician will be set up at the job site, or samples will be sent daily by carrier or mail for next day delivery or read on site, so that verbal reports on air samples can be obtained within 24 hours.

1. A complete record, certified by the testing laboratory. Of all air monitoring tests and results will
be furnished to the Owner's Representative, the Owner and the Contractor.

2. The Contractor will have access to all air monitoring test and results.

3. Written Reports of all air monitoring test will be posted at the job site on a daily basis.

1.10 TRANSMISSION ELECTRON MICROSCOPY SERVICES:

A. **Transmission Electron Microscopy** services: include verbal results available on weekdays within 24 hours turnaround time after they arrive in the laboratory. Weekend or Holiday analysis is available on request. Due to the cost differences of each response time, the Owner will determine which turnaround times are requested. Contractor should submit with Bid, unit cost for each day of waiting beyond that set forth here.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 START OF WORK:

A. **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.

B. **Visual inspection:** Perform visual inspections of the work area along with the Project Administrator at each step of the decontamination process. Inspection procedures may be utilized from the EPA Purple Book, ASTME 1368 standards, or a combination of the two sources, to be determined by the Owner's Representative to best meet the site conditions.

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

1. Primary Barrier: Two layers of polyethylene sheeting on floor, walls, and ceiling.

2. Critical Barrier: An airtight barrier of 2 independent layers of polyethylene sheeting between the Work Area and other portions of the building or the outside.

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

4. Decontamination Units: For personnel and equipment in operating condition.

5. Pressure Differential System: In operation.

3.2 FIRST CLEANING:

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

1. Remove All Filters in Air Handling System(s) and dispose of as asbestos-containing waste in accordance with requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material.

2. After the surfaces have passed a visual inspection verifying that all debris and residue has been removed from the sheet plastic, allow a waiting period that is long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain Pressure Differential System in operation for the entire 96 air change period.

3.3 VISUAL INSPECTION:

A. After First Cleaning Perform a Complete Visual Inspection of the entire Work Area including: all surfaces, ceiling, walls, floor, decontamination unit, all plastic sheeting, seals over ventilation openings, doorways, windows, and other openings; look for debris from any source, residue on surfaces, dust or other matter. During visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Administrator.

B. **Temporary lighting:** Provide a minimum of 100 foot candles of lighting on all surfaces in the areas to be subjected to visual inspection. Provide hand held lights providing 150 foot candles at 4 feet capable of reaching all locations in work area.

C. **Lifts:** Provide ladders, scaffolding, and lifts as required to provide access to all surfaces in the area to be subjected to visual inspection. Access is to allow touching of all surfaces.

3.4 FINAL CLEANING:

A. **Final Cleaning:** Carry out a final cleaning of all surfaces in the Work Area in the same manner as the previous cleaning.

B. **Contractor's Testing:** At the completion of the above cleaning visually inspect all surfaces. Re-clean if any dust, debris, etc. is found. At completion of this inspection sweep entire Work Area including walls, ceilings, ledges, floors and other surfaces in the Work Area with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). Do not direct forced air equipment at any seal in any critical barrier. If any debris or dust is found repeat the final cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced air equipment.

C. **After a visual inspection**, again wait for a period of time long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to allow HEPA filtered fan units to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of Work Areas during this period. Maintain Pressure Differential System in operation for the entire 96 air change period.

3.5 LOCK-BACK:

A. **Encapsulation of substrate:** Perform encapsulation of substrate or installation of spray-applied finishes or fireproofing, where required, before Removal of Work Area Isolation as specified below. Maintain Pressure Differential System in operation during encapsulation work.

3.6 AGGRESSIVE SAMPLING BY THE CONTRACTOR'S REPRESENTATIVE:

A. **All Air Samples** will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10,000 cubic feet of room volume.

2. One 20 inch diameter fan per 10,000 cubic feet of room volume will be mounted in a central location at approximately 6 feet above floor, directed toward ceiling and operated at low speed for the entire period of sample collection.

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

4. After air sampling pumps have been shut off, fans will be shut off.

5. In work areas where a dirt floor or exposed fibrous glass insulation is in the space, but outside the work area, maintain a critical barrier to prevent disturbance of these surfaces during aggressive sampling.

3.7 CLEARANCE AIR SAMPLING:

A. Phase Contrast Microscopy (PCM): For removal of quantities of ACM <160 SF or <260 LF, after the Work Area is found to be visually clean, air samples will be taken and analyzed by the Owner's Representative in accordance with the procedure for Phase Contrast Microscopy set forth in Part 1 of this section.

1. If Release Criteria are not met, repeat Final Cleaning and continue decontamination procedure from that point.

2. If Release Criteria are met remove work area isolation in accordance with requirements of this section.

A. **Transmission Electron Microscopy (TEM):** For removal of quantities of ACM > 160 SF or > 260 LF, after the work area is found to be visually clean, TEM air samples will be collected and analyzed by the Owner’s Representative in accordance with the procedure for Transmission Electron Microscopy set forth in Part 1 of this section:

1. If Release Criteria are not met, repeat Final Cleaning and continue Decontamination procedure from that point.

2. If Release Criteria are met, remove work area isolation in accordance with requirements of this section.

3.8 REMOVAL OF WORK AREA ISOLATION:

A. After all requirements of this section have been met:

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

2. Remove Personnel Decontamination Unit.

3. Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Owner's Representative, are found then the entire area affected shall be decontaminated as specified in Section 01712 Cleaning & Decontamination Procedures.

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

5. Dispose of all asbestos-containing waste material as specified in Section 02084 Disposal of Regulated Asbestos Containing Material.

3.9 SUBSTANTIAL COMPLETION OF ABATEMENT WORK:

A. Asbestos Abatement Work is Substantially Complete upon meeting the requirements of this section including submission of:

1. Certificate of Visual Inspection

2. Receipts Documenting proper disposal as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

3. Punch list detailing repairs to be made and incomplete items.

3.10 CERTIFICATE OF VISUAL INSPECTION:

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

END OF SECTION - 01711

BATTA ENVIRONMENTAL ASSOCIATES, INC.

CERTIFICATION OF FINAL VISUAL AND ACCEPTANCE INSPECTION

JOB NAME: _____ BEA NO.: _____

WORK AREA: _____

CONTRACTOR'S SUPERVISOR CERTIFICATION

In accordance with section 01711 "Project Decontamination", the Contractor hereby certifies that he has visually inspected the work area (all surfaces including pipes, beams, ledges, walls, ceiling and floor, decontamination units, sheet plastic, etc) and has found no dust, debris, or residue.

BY: (Signature)_____ DATE:_____

Printed Name_____ Firm Name_____
Field Superintendent

ENVIRONMENTAL FIELD TECHNICIANS CERTIFICATION

The Environmental Field Technician hereby certifies that he has accomplished the contractor on his visual inspection and verifies that this inspection has been through, and to the best of his knowledge, and belief, the contractors certifications above is a true and honest one.

BY: (Signature)_____ DATE:_____

Printed Name_____ Batta Environmental Associates, Inc.
Field Technician

PROJECT DESIGNER CERTIFICATION

The Project Designer hereby certifies that he has accompanied the contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the contractors certification above is a true and honest one.

BY: (Signature)_____ DATE:_____

Printed Name_____ Batta Environmental Associates, Inc.
Project Designer

BUILDING OWNER'S CERTIFICATION

The Building Owner or Owner's Representative hereby certifies that he/she has accompanied the project designer on a final walk through inspection, and, to the best of their knowledge, is satisfied that the contractor has fulfilled his contractual obligations. All discrepancies identified at this time have been noted in pre-existing conditions, or post tear down inspections throughout the project.

BY: (Signature)_____ DATE:_____

Printed Name_____

BATTA ENVIRONMENTAL ASSOCIATES, INC.

SECTION 01712 - CLEANING AND DECONTAMINATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF THE WORK:

A. **The work includes** that listed on Section 01013 of this specification, as shown on the drawings

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL:

A. **Complete the following before start of work** of this section:

1. 01527 Regulated Areas

2. 01560 Worker Protection-Asbestos Abatement

3. 01561 Worker Protection-Repair and Maintenance

4. 01562 Respiratory Protection

3.2 WET CLEANING:

A. **Accomplish wet cleaning** during decontamination with paper towels or disposable rags:

B. **Immerse paper towel** or rag in container of amended water or dilute removal encapsulant.

C. **Wring out**,

D. **Fold into quarters**,

E. **Wipe surface once** and refold to a fresh face of cloth. Proceed in this manner until all available faces of paper towel or rag have been used.

F. **Dispose of paper towel** or rag,

G. **Do not place rag back in container** to rinse out or for any other purpose. If a used towel or rag comes in contact with water, empty container and refill.

H. **Material adhered** to a surface with removal encapsulate may require the application of additional removal encapsulate to facilitate cleaning.

3.3 REMOVAL OF ASBESTOS-CONTAINING DEBRIS

A. **Work of this Section** includes that listed in section 01013 of this section.

B. **Remove asbestos-containing debris** and decontaminate the area involved using the following sequence:

1. Shut down all ventilation into room.

2. Seal entry to work area with 6 mil polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

3. Start HEPA vacuum before entering the area.

4. Use the HEPA vacuum to clean a path at least 6 feet wide from the entry point of the work area to the site of the fallen material.

5. Remove all small debris with the HEPA vacuum.

6. HEPA vacuum surfaces of all pieces too large to be removed by the suction of the HEPA vacuum.

7. Pick up such pieces and place in the bottom of a 6-mil polyethylene disposal bag conforming to the requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material. Place pieces in the bag without dropping and avoiding unnecessary disturbance and release of material.

8. Remove all remaining visible debris with HEPA vacuum.

9. HEPA vacuum an area 3 feet beyond the location in which any visible debris was found in two directions each at right angles to the other.

10. Place a 6-mil polyethylene drop cloth in accordance with Section 01527, Local Area Protection, immediately on top of the HEPA vacuumed area before performing any repair work on site from which fall-out occurred.

11. HEPA vacuum the site from which material fell removing all loose material which can be removed by the vacuums suction.

12. Repair or remove remaining material.

13. HEPA vacuum ladder and/or any tools used and pass out of the work area.

C. **HEPA vacuum all surfaces** in the room starting at the top of wall and working downward to the floor. Then start at corner of floor farthest from Work Area entrance and work towards entrance.

1. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one-half the width of the floor attachment. At the completion of one cleaning vacuum the floor a second time at right angles to the first.

D. **Secure area from occupancy** until air monitoring results per Section 01714 Project Decontamination indicate that area is safe for re-occupancy.

3.4 CLEANING AND DECONTAMINATING OBJECTS

A. **Perform all work of decontaminating objects** wherever possible on a plastic drop sheet installed in conformance with Section 01527. (Local exhaust system must be established prior to any cleaning.)

B. **HEPA vacuum** all surfaces of object and immediate area before moving the object.

C. **Pick-up object**, if possible, and HEPA vacuum all surfaces.

D. **Hand to off-sheet worker** who will wet-clean object, if possible, and place in storage location.

E. **Decontaminate area** where object was located by HEPA vacuuming twice, in two perpendicular directions. Wet clean if necessary to remove any debris.

F. **Return object** to its original location.

3.5 DECONTAMINATION OF ROOMS:

A. **Shut down all ventilation into space**.

B. **Seal entry to Work Area** with 6 mil polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

C. **Install Differential Pressure System** in accordance with Section 01513.

D. **HEPA vacuum all surfaces** in the room starting at the ceiling, then top of wall and working downward to the floor.

E. **HEPA vacuum the floor** using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one half the width of the floor attachment. At the completion of one cleaning, vacuum the floor a second time at right angles to the first.

F. **Operate HEPA filtered fan unit** in space for 96 air changes minimum.

G. **At completion of Decontamination Work** workers decontaminate in accordance with Section 01561 Worker Protection - Repair and Maintenance.

H. **Secure area from occupancy** until air monitoring results per Section 01714 Work Area Clearance indicate area is safe for re-occupancy.

END OF SECTION - 01712