

COMPLIANCE ENVIRONMENTAL, INC.

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.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. **The Project** consists of interior asbestos abatement at the Booker T. Washington Elementary School Historical Section as follows:
1. **Project Name:** 2014 Asbestos Abatement of Exterior and Interior Surfaces at the Booker T. Washington Elementary School Historical Section.
 2. **Project Location:** Booker T. Washington Elementary School, 901 Forest Street, Dover, Delaware.
 3. **Owner:** Capital School District, 198 Commerce Way, Dover, Delaware 19904
 4. **Work Period:** All required activities must be completed between November 6 and December 31, 2014. Final completion must be achieved by December 31, 2014.
 5. **Desired Work Schedule:** The Owner desires that all work be completed as soon as possible. **Roof work must be completed starting after 3:00 pm, Monday through Friday, and during all school sessions. The Contractor shall include in its bid all necessary temporary exterior and interior lighting needed to complete the roof work during evening and nighttime hours. The Contractor shall also include in its bid all necessary additional safety items needed for evening and nighttime work.**
 6. **Prevailing Wage Rates:** Current State of Delaware Prevailing Wage Rates are in effect. Wage rates are provided in the specification. The project is in Kent County. (Part II., General Specifications)
 7. **Liquidated Damages:** The Contractor shall pay liquidated damages at the rate of \$ 2,000.00 per calendar day if substantial completion is not achieved by December 31, 2014.
 8. **Owner's Representative:** Compliance Environmental, Inc. will represent the Building Owner on this project.
- B. **Contract Documents**, dated September 18, 2014 were prepared for the Project by Compliance Environmental, Inc., 150 South Bradford Street, Dover, Delaware 19904, CEI Project Number CEI-091814. Conditions and requirements are indicated on the Contract Documents including, but not limited to, this specification, drawings, and any addenda to the specifications.
- C. **The Work** consists of the removal of asbestos-containing roof materials, transite panels, window glazing, floor tiles, floor coverings, pipe insulation and pipe insulation fragments from the Booker T. Washington Elementary School Historical Section in the work areas shown on the drawings for work described in this specification. This work is being performed in preparation of renovation of the building.
1. **Work to be Performed Under This Contact:** includes complete removal and proper disposal of all asbestos-containing and asbestos-contaminated materials at the Booker T. Washington Elementary School Historical Section building. **Since the adjacent sections of the school building will be occupied during the work, the Contractor must perform**

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all work in a manner to prevent asbestos exposure, contamination, and/or uncontrolled releases of asbestos outside of work areas. A permanent wooden containment barrier (barricade) shall be constructed prior to asbestos removal activities at locations shown on Drawing B in a manner to prevent intentional and/or accidental entry into Work Areas. See Number 37 (below, this Section) for details regarding construction of the barrier. Asbestos locations are shown on Contract Documents prepared by Compliance Environmental, Inc. The bulk sampling report is provided for reference.

The total estimated asbestos-containing materials to be abated is as follows:

- (i). Rolled Roofing 1,500 Square Feet
- (ii). Built-Up roofing 26,400 Square Feet
- (iii). Transite Panels 88 Each
- (iv). Window Glazing 105 Square Feet
- (v). Single Floor Tile & Covering (No Mastic) 300 Square Feet
- (vi). Single Floor Tile & Covering Under Wood (No Mastic) 1,300 Square Feet
- (vii). Double Floor Tile & Covering Under Wood (No Mastic) 4,700 Square Feet
- (viii). Pipe Insulation (with Floor Fragments) 25 Linear Feet

Tables 1. and 2. provide estimated asbestos-containing materials quantities by location for the Contractor's use.

Non-asbestos-containing partition walls, doors, and built in features (e.g., desks, shelving) are required to be removed by the Contractor to access asbestos-containing materials for complete abatement. The total estimated quantity of non-asbestos-containing partition walls to be removed is approximately 2,500 Square Feet.

- 2. **Work to be Performed Prior to Work Under This Contact:** The Owner shall remove all non-fixed articles (e.g., furniture, computers, boxes) from work area(s) that are not contaminated.
- 3. **Project Site Notices:** The Contractor shall provide, as a minimum and at all times, at a visible location at the project site, the following:
 - (i). Equal Employment Opportunity and Minimum Wage Information
 - (ii). U.S. EPA 10-Day Notification (Original Notice Sent by CEI)
 - (iii). State of Delaware DNREC 10-Day Notification (Original Notice Sent by CEI)
 - (iv). State of Delaware Prevailing Wage Determination
 - (v). Site Supervisor and Worker Badges
 - (vi). Air Sampling Results (if any)
 - (vii). Emergency Planning Procedures
 - (viii). Subcontractor List
 - (ix). Material Safety Data Sheets
- 4. **Submittals Prior to Site Work:** The Contractor shall provide the following items to the Owner's Representative prior to asbestos abatement:
 - (i). Signed Contracts.
 - (ii). Signed Payment and Performance Bonds (if applicable).
 - (iii). Certificate of Liability Insurance.
 - (iv). Copy of the U.S. EPA 10-Day Notification.
 - (v). Copy of the State of Delaware DNREC 10-Day Notification.
 - (vi). Project Schedule.
 - (vii). Completed Initial Exposure Assessment Form (Appendix C, Section 01562)
 - (viii). Completed Certificates of Site Worker's Acknowledgment Forms (Appendix C,

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Section 01560).

- (ix). Complete list of Project Supervisors and Workers including names and addresses.
 - (x). Fit test results, medical results, and certifications for Project Supervisors and Workers.
5. **Presumed Asbestos Materials:** No presumed asbestos-containing materials are located in work areas.
 6. **Unit Prices:** The unit prices listed on the bid form could be used to adjust the Contractor's base bid and alternates, add or deduct, for changes in quantities on the project. However, the Owner reserves the right to accept or reject these listed unit prices and to ask the Contractor to provide other pricing based upon project conditions.
 7. **Measurements and Dimensions:** It is the Contractor's responsibility to verify all measurements prior to the openings of the bids. Any discrepancies in the measurements or work site conditions must be made prior to the opening of the bids.
 8. **Work Area Security & Protection:** In performing the work, the Contractor is responsible for the security of the work area and protection of any and all equipment, materials, and surfaces not scheduled for work activities. The Contractor shall not be provided with a key to building(s) where work is to be performed. It is the Contractor's responsibility to adequately barricade, sign and control access to work areas in such a way to prevent accidental access to work areas.
 9. **Damage Repair & Missing Item Replacement:** The Contractor shall repair or replace, at his own expense, any damage occurring during his activities. Damage shall include, but not limited to, damage from duct tape, spray glue, and water usage. Any damaged or missing items will be replaced or paid for by the Contractor prior to receipt of final contract payment.
 10. **Payment Requests:** The Owner's Representative shall review and recommend payment of all invoices from the Contractor. Invoices shall be submitted by the Contractor in a form acceptable to both the Owner's Representative and Owner.
 11. **Critical Barriers:** Critical barriers consisting of two (2) single layers of 6-mil polyethylene sheeting applied separately by the Contractor with varying tape lines shall be installed, as a minimum, at ventilation systems, doors, windows, electrical wall switches and receptacle, and other openings in the work area. See Section 01526 for more information.
 12. **Ventilation Systems:** The Contractor shall completely immobilize any ventilation systems in work areas by, as a minimum, by sealing supply and return ducts with critical barriers, locking and tagging the system "off," notifying building operators, and providing proper labeling. See Section 01513 for more information.
 13. **Toilet Facilities:** The Contractor shall provide, at his own expense, toilet facilities for his use during the project.
 14. **Floor Tile Machines:** The use of floor tile machines are allowed on this project at the discretion of the Contractor and if the Contractor can demonstrate after bidding and prior to the start of the work, that proper usage and effective decontamination procedures will be used by the Contractor. If the Contractor elects to use a floor tile machine for any portion of the work herein, prior to its usage, the Contractor shall submit a written Work Plan for review and have the Work Plan approved. The Work Plan shall contain, at a minimum, the following elements:
 - (i). The floor tile machine(s) will be visual inspection by the Owner's Representative prior to use on this Project to verify that the machine is clean and containing no viable debris or contamination. If not acceptable, the floor tile machine(s) cannot be used on this Project.
 - (ii). The Contractor shall be responsible for any damage caused by the machine(s).
 - (iii). Detailed description of the method(s) which will be used by the Contractor to

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decontaminate the equipment and verify using AHERA visual and air testing clearance protocols, that the equipment was effectively decontaminated. All visual and air testing required will be at no additional cost to the Owner. The Contractor shall provide documentation to the Owner's Representative that it has passed all AHERA visual and air testing clearance protocols prior removal of any floor tile machines from its decontamination area.

- (iv). Decontamination shall be performed prior to moving of the machine(s) out of any Work Area to effectively remove any asbestos residue. Decontamination shall be performed in a dedicated containment (the equipment decontamination/bag-out area can be used provided it can accommodate all of the required activities). After decontamination, the Contractor shall provide documentation to the Owner's Representative that the machine was properly decontaminated prior to removal of the machine out of any Work Area including all air testing results.

The Contractor acknowledges by submission of it's bid, that there are no guarantees made by the Owner that approval of floor tiles machines will be granted and the Contractor reaffirms that if floor tile machines are not approved for use on this project, that manual scrapping methods will be used to complete the project in accordance with the Specifications at no additional cost to the Owner.

15. Removal Procedures:

(i). **Floor Tile:**

Work areas contain multiple layers of floor tiles covered by linoleum, carpeting and/or wood. Some floor areas may be in poor condition. The Contractor shall use proper means, methods and work practices to prevent asbestos fragments and contaminated dusts from falling below work areas into interior spaces. Install a three-stage decontamination unit, with shower, at the entrance to the work area containments. The decontamination units shall be installed in such a manner as to allow for separate equipment room/bag-out off to the side. **In No Instance Will the Personal Decontamination Unit Be Used for Bag-out or Equipment Passage.** Install and operate HEPA filtered air filtration devices. Pre-clean any areas needing critical barriers, and install critical barriers. The work area shall consist of two (2) layers of 6-mil plastic sheeting as critical barriers and one (1) layer of 6-mil plastic sheeting on ceilings and walls. Establish and maintain at all times a pressure differential of minus 0.02 inches of water measured on a strip chart recorder or other approved method. The pressure differential recorder shall be checked several times daily by the Contractor. The contractor shall supply a calibrated differential pressure manometer capable of monitoring and recording on a strip chart and measuring differential pressure of 0.005 inches of water. The manometer shall be equipped with an automatically activated alarm system which will sound a warning if the pressure rises above the minimum value. All strips charts will be submitted to the Owner's Representative at the completion of the project. **Work will not begin or continue until an adequate differential pressure is achieved and maintained.** Once negative air is established, the Contractor may start removing the carpet and/or wood covering (if applicable). If the carpet and/or wood covering comes up without disturbing the floor tile, it may be disposed by the Contractor as a general debris. However, if the floor tile is disturbed while removing the carpeting (and padding if applicable) and/or wood covering, the carpeting (and padding if applicable) and wood covering shall be disposed by the Contractor of as contaminated waste. The Contractor is

responsible for proper handling, storage, transporting and disposal of all wastes. **The use of floor tile machines are allowed on this project at the discretion of the Contractor and if the Contractor can demonstrate after bidding and prior to the start of the work, that proper usage and effective decontamination procedures will be used by the Contractor in accordance with this Section.** For locations where floor tile abatement will end at other locations (e.g., hallway, floor heaters, fixed objects), the Contractor shall provide a clean break (no jagged edges) to the face of the object and apply a suitable lock down material on all exposed edges. No floor tile edges shall be left in a friable or damaged condition. Finished floor to be in a smooth condition suitable for re-installation of floor covering. Remove floor heater covers in work area (if applicable) to inspect interior of units for asbestos. If asbestos floor tile is found, follow specified removal and disposal procedure. Remove and dispose of any floor tile under window and/or wall mounted HVAC units. The Contractor shall take the necessary precautions to protect all computer, fiber optic and electronic equipment including building sensors from damage during the Contractor's activities and also including, but not limited to, walls, ceilings, floors outside work areas, doors, thresholds, and fixed objects within work area(s). Any damaged painted surfaces shall be repaired at the Contractor's expense. All floor tile shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked or thoroughly wetted and wrapped in double-layers of 6-mil poly for proper disposal. All waste shall be properly handled and labeled for disposal by the Contractor. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Fiber and/or metal drums may be used. All daily air sampling will be laboratory analyzed by Phase Contrast Microscopy (PCM) methods unless the Owner or State Agency requires other methods. Final air clearance samples will be by Transmission Electron Microscopy (TEM). See Sections 01529, 02081, 02087 and this specification for more information.

- (ii). **Linoleum:**
Work areas contain multiple layers of linoleum covered by floor tiles, carpeting and/or wood. Some floor areas may be in poor condition. The Contractor shall use proper means, methods and work practices to prevent asbestos fragments and contaminated dusts from falling below work areas into interior spaces. Install a three-stage decontamination unit, with shower, at the entrance to the work area containments. The decontamination units shall be installed in such a manner as to allow for separate equipment room/bag-out off to the side. **In No Instance Will the Personal Decontamination Unit Be Used for Bag-out or Equipment Passage.** Install and operate HEPA filtered air filtration devices. Pre-clean any areas needing critical barriers, and install critical barriers. The work area shall consist of two (2) layers of 6-mil plastic sheeting as critical barriers and one (1) layer of 6-mil plastic sheeting on ceilings and walls. Establish and maintain at all times a pressure differential of minus 0.02 inches of water measured on a strip chart recorder or other approved method. The pressure differential recorder shall be checked several times daily by the Contractor. The contractor shall supply a calibrated differential pressure manometer capable of monitoring and recording on a strip chart and measuring differential pressure of 0.005 inches of water. The manometer shall be equipped with an automatically activated alarm system which will sound a warning if the pressure rises above the

minimum value. All strips charts will be submitted to the Owner's Representative at the completion of the project. **Work will not begin or continue until an adequate differential pressure is achieved and maintained.** Once negative air is established, the Contractor may start removing the carpet and/or wood covering (if applicable). If the carpet and/or wood covering comes up without disturbing the floor tile, it may be disposed by the Contractor as a general debris. However, if the floor tile is disturbed while removing the carpeting (and padding if applicable) and/or wood covering, the carpeting (and padding if applicable) and wood covering shall be disposed by the Contractor of as contaminated waste. The Contractor is responsible for proper handling, storage, transporting and disposal of all wastes. **The use of floor tile machines for linoleum are allowed on this project at the discretion of the Contractor and if the Contractor can demonstrate after bidding and prior to the start of the work, that proper usage and effective decontamination procedures will be used by the Contractor in accordance with this Section.** For locations where linoleum abatement will end at other locations (e.g., hallway, floor heaters, fixed objects), the Contractor shall provide a clean break (no jagged edges) to the face of the object and apply a suitable lock down material on all exposed edges. No linoleum edges shall be left in a friable or damaged condition. Finished floor to be in a smooth condition suitable for re-installation of floor covering. Remove floor heater covers (if applicable) in work area to inspect interior of units for asbestos. If linoleum is found, follow specified removal and disposal procedures. Remove and dispose of any linoleum under window and/or wall mounted HVAC units. The Contractor shall take the necessary precautions to protect all computer, fiber optic and electronic equipment including building sensors from damage during the Contractor's activities and also including, but not limited to, walls, ceilings, floors outside work areas, doors, thresholds, and fixed objects within work area(s). Any damaged painted surfaces shall be repaired at the Contractor's expense. All linoleum shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked or thoroughly wetted and placed in double-layers of 6-mil poly for proper disposal. All waste shall be properly handled and labeled for disposal by the Contractor. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Fiber and/or metal drums may be used. All daily air sampling will be laboratory analyzed by Phase Contrast Microscopy (PCM) methods unless the Owner or State Agency requires other methods. Final air clearance samples will be by Transmission Electron Microscopy (TEM). See Sections 01529, 02081, 02087 and this specification for more information.

(iii). **Pipe Insulation and Fragments:**

Asbestos pipe insulation (covering) is friable and shall be properly removed, bagged, transported and disposed by the Contractor. In addition, pipe covering fragments in the work area shown on the drawings shall be removed by the Contractor. **Prior to removal, the Contractor shall verify that all utilities have been shut-off and purged.** The Contractor shall then install a three-stage decontamination unit, with shower, at the entrance to the work area containment. The decontamination unit shall be installed in such a manner as to allow for a combined equipment room/bag-out off to the side. Don personal protective equipment prior to entering the containment area. Personal Protective Equipment shall include as a minimum, full-body coveralls, head and foot covers. For gross

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removal or should the fiber counts reach the Permissible Exposure Limit (PEL) at any time, Type C, Grade D respirators operating in the pressure demand mode will be required. Install and operate HEPA filtered air filtration devices. Pre-clean any areas needing critical barriers, and install critical barriers. The work area shall consist of two (2) layers of 6-mil plastic sheeting as critical barriers and one (1) layer of 6-mil plastic sheeting on ceilings and walls. Establish and maintain at all times a pressure differential of minus 0.02 inches of water measured on a strip chart recorder or other approved method. The pressure differential recorder shall be checked several times daily by the Contractor. The contractor shall supply a calibrated differential pressure manometer capable of monitoring and recording on a strip chart and measuring differential pressure of 0.005 inches of water. The manometer shall be equipped with an automatically activated alarm system which will sound a warning if the pressure rises above the minimum value. All strips charts will be submitted to the Owner's Representative at the completion of the project. The Contractor shall place a fire extinguisher and have a first aid kit at each containment. An additional fire extinguisher shall be provided by the Contractor where containments exceed 1,000 square feet. Temporary ground fault electrical panels shall be installed outside of containment areas and used by the Contractor for all electrical connections. The Contractor shall use water-proof lights inside of all work areas. **Work will not begin or continue until an adequate differential pressure is achieved and maintained.** Once negative air is established, the Contractor shall begin abatement of the pipe coverings. The Contractor can use glove bagging means and methods to perform the abatement. Pipe coverings The Contractor shall completely remove the pipe coverings in a manner which prevents damage to building materials and components. Pipe coverings shall be double bagged in a manner to prevent the contents of the bag from escaping. The pipe coverings shall be properly wetted and labeled for disposal. Care shall be taken by the Contractor considering the right amount of water required not to create leaking conditions or hazards to the work area or surrounding area, including the ceiling of the first floor. The Building Owner shall provide water for the Contractor's use during the work. The Contractor shall ensure that proper back-flow protection at all sources of water are installed and maintained. The Contractor is responsible for proper disposal of all wastes. A remote three-stage decontamination unit with shower shall be provided and used by the Contractor during the work. As a minimum, all workers shall shower at the end of each shift. The Contractor shall ensure the integrity of all decontamination facilities. All decontamination procedures shall be strictly implemented by the Contractor. Shower wastewater shall be either filtered or jelled. All filters and/or jelled water shall be disposed by the Contractor as contaminated waste. All pipe coverings and fragments shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked for proper disposal. All waste shall be properly handled and labeled by the Contractor for disposal. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Fiber and/or metal drums may be used. Final inspection shall consist of a visual inspection and air sampling. All daily air sampling will be laboratory analyzed by Phase Contrast Microscopy (PCM) methods unless the Owner or State Agency requires other methods. Final air clearance samples will be by Transmission Electron Microscopy (TEM). See Sections 01529, 02081, 02087 and this specification for more information.

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(iv). **Window Glazing:**

Window glazing includes glazing materials and caulks. Asbestos-containing window glazing and caulks identified on the drawings and in this specification shall be completely removed and disposed by the Contractor. The Contractor shall not remove or disposal of any windows or its components containing glazing or caulks. Safety of project workers, building occupants and property users must be given priority for all activities. The Contractor shall ensure at all times that the condition of work areas and access to work areas do not contain hazards. The Contractor shall comply with all Federal, State and local laws, regulations, ordinances, and guidelines including, but not limited to, EPA, OSHA, and the State of Delaware. It is the Contractor's responsibility to ensure that all appropriate laws, regulations, ordinances, and guidelines are implemented at all times during the work. Prior to beginning the work, the Contractor shall deploy and maintain a suitable drop cloth at ground elevation consisting of a double layer of polyethylene sheeting inside of the building and at least 10 linear feet outside of the building extending outward along the perimeter at all work areas to collect fallen materials during removal. Additionally, the Contractor shall deploy and maintain barrier tape and signage at the perimeter of all work areas. Barrier tape shall extend at least 10 linear feet outward and be deployed and maintained in a condition sufficient to restrict access. Signs shall state "Caution, Overhead Work" and shall extend at least 15 linear feet outward. All abated material must be properly wetted and bagged in a manner to provide a leak-free condition. The Contractor is responsible for any or all damages caused by him. During the abatement, the Contractor shall protect all building features in and around the work area. Dry removal of asbestos-containing materials are not allowed. Care shall be taken by the Contractor considering the right amount of water required not to create leaking conditions or hazards to the work area or surrounding area. The Building Owner shall provide water for the Contractor's use during the work. The Contractor shall ensure that proper back-flow protection at all sources of water are installed and maintained. The Contractor shall place a fire extinguisher and have a first aid kit at each work area. The minimum respiratory protection shall be full-face PAPRs for all workers. Additionally, as a minimum, all workers shall don double personal protective suits. Respiratory protection and personal protective equipment shall be worn by all workers during all steps of the work including, but not limited to, setup, removal, placing of waste into dumpsters or containers, final cleaning and tear down. A remote three-stage decontamination unit with shower shall be provided and used by the Contractor during the work. As a minimum, all workers shall shower at the end of each shift. The Contractor shall ensure the integrity of all decontamination facilities. All decontamination procedures shall be strictly implemented by the Contractor. Shower wastewater shall be either filtered or jelled. All filters and/or jelled water shall be disposed by the Contractor as contaminated waste. All window glazing and caulks shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked for proper disposal. All waste shall be properly handled and labeled by the Contractor for disposal. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Final inspection shall consist of a visual inspection. No final air clearance samples will be required in work areas. See Section 02081 and this specification for more information.

(v). **Transite Panels:**

Exterior windows along the perimeter of the building contain transite panels. The Contractor shall safely remove, handle, transport and dispose of transite panels. After removal of panels each day, the Contractor shall install temporary plywood at each window location in a manner for lasting prevention of unauthorized access into the building and provide a barrier to protect the building from weather exposure. Safety of project workers and the building occupants must be given priority for all activities. The Contractor shall ensure at all times that the condition of work areas and access to work areas do not contain hazards. The Contractor shall comply with all Federal, State and local laws, regulations, ordinances, and guidelines including, but not limited to, EPA, OSHA, and the State of Delaware. It is the Contractor's responsibility to ensure that all appropriate laws, regulations, ordinances, and guidelines are implemented at all times during the work. Prior and during removal of transite panel materials, the Contractor shall deploy and maintain a suitable drop cloth at ground elevation next to all work areas extending at least 10 linear feet outward to collect fallen materials during removal. Additionally, the Contractor shall deploy and maintain barrier tape and signage at the perimeter of all work areas. Barrier tape shall extend at least 10 linear feet outward and be deployed and maintained in a condition sufficient to restrict access. Signs shall state "Caution, Overhead Work" and shall extend at least 15 linear feet outward. The Contractor shall remove all asbestos-containing transite panels to a condition whereby the final substrate is smooth and free of any material. Any loose transite must be properly removed and disposed. The Contractor is responsible for any or all damages caused by him. During the abatement, the Contractor shall protect all building features in and around the work area. Materials shall be adequately wetted with amended water by the Contractor during all removal work to prevent visible emissions. Dry removal of asbestos-containing materials are not allowed. Care shall be taken by the Contractor considering the right amount of water required not to create leaking conditions or hazards to the work area or surrounding area. The Building Owner shall provide water for the Contractor's use during the work. The Contractor shall ensure that proper back-flow protection at all sources of water are installed and maintained. The Contractor shall place a fire extinguisher and have a first aid kit at each work area. The minimum respiratory protection shall be full-face PAPRs for all workers. Additionally, as a minimum, all workers shall don double personal protective suits. Respiratory protection and personal protective equipment shall be worn by all workers during all steps of the work including, but not limited to, setup, removal, placing of waste into dumpsters or containers, final cleaning and tear down. A remote three-stage decontamination unit with shower shall be provided and used by the Contractor during the work. As a minimum, all workers shall shower at the end of each shift. The Contractor shall ensure the integrity of all decontamination facilities. All decontamination procedures shall be strictly implemented by the Contractor. Shower wastewater shall be either filtered or jelled. All filters and/or jelled water shall be disposed by the Contractor as contaminated waste. All transite panels shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked or thoroughly wetted and wrapped in double-layers of 6-mil poly for proper disposal. All waste shall be properly handled and labeled for disposal by the Contractor. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Final inspection shall consist of a visual

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inspection. No final air clearance samples will be required in work areas. See Section 02081 and this specification for more information.

(vi). **Roofing:**

Roof areas contain multiple layers and varying types of roofing materials. The roof deck may be in poor condition. The Contractor shall use proper means, methods and work practices to prevent asbestos fragments and contaminated dusts from falling below work areas into interior spaces. The Contractor must coordinate directly with the roofing contractor to establish daily work areas, a sequence of work, and quantity of asbestos to be abated each day to ensure that new roofing can be installed in the required time frame to protect the building from weather intrusion. Asbestos-containing mastic shall be removed from wood, tectum and any other decking to the best extent possible without damaging the decking. All asbestos-containing materials shall be removed from all roof vent pipes, ventilators and vent coverings. In lieu of manual scraping roof ventilators, the Contractor may wrap, cut, remove and dispose of roof ventilators as asbestos-containing material. Remaining open ductwork will be patched by the roofing contractor. Since removal of roofing will be performed during evening and night hours, the Contractor shall include in its bid the cost of all necessary temporary lighting and safety equipment required for the project.

Safety of project workers, building occupants, and property users must be given priority for all activities. The Contractor shall ensure at all times that the condition of work areas and access to work areas do not contain hazards. The Contractor shall comply with all Federal, State and local laws, regulations, ordinances, and guidelines including, but not limited to, EPA, OSHA, and the State of Delaware. It is the Contractor's responsibility to ensure that all appropriate laws, regulations, ordinances, and guidelines are implemented at all times during the work. Prior and during removal of exterior roof materials, the Contractor shall deploy and maintain a suitable drop cloth at ground elevation next to all work areas extending at least 10 linear feet outward to collect fallen materials during removal. Additionally, the Contractor shall deploy and maintain barrier tape and signage at the perimeter of all work areas. Barrier tape shall extend at least 10 linear feet outward and be deployed and maintained in a condition sufficient to restrict access. Signs shall state "Caution, Overhead Work" and shall extend at least 15 linear feet outward. The Contractor shall remove all asbestos-containing roofing materials to a condition whereby the final substrate is smooth and free of any roofing material. The Contractor is responsible for any or all damages caused by him. During the abatement, the Contractor shall protect all building features in and around the work area. Materials shall be adequately wetted with amended water by the Contractor during all removal work to prevent visible emissions. Dry removal of asbestos-containing materials is not allowed. Care shall be taken by the Contractor considering the right amount of water required not to create leaking conditions or hazards to the work area or surrounding area. The Building Owner shall provide water for the Contractor's use during the work. The Contractor shall ensure that proper back-flow protection at all sources of water are installed and maintained. The Contractor shall place a fire extinguisher and have a first aid kit at each work area. The minimum respiratory protection shall be full-face PAPR's for all workers. Additionally, as a minimum, all workers shall don double personal protective suits. Respiratory protection and personal protective equipment shall be worn by all

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workers during all steps of the work including, but not limited to, setup, removal, placing of waste into dumpsters or containers, final cleaning and tear down. A remote three-stage decontamination unit with shower shall be provided and used by the Contractor during the work. As a minimum, all workers shall shower at the end of each shift. The Contractor shall ensure the integrity of all decontamination facilities. All decontamination procedures shall be strictly implemented by the Contractor. Shower wastewater shall be either filtered or jelled. All filters and/or jelled water shall be disposed by the Contractor as contaminated waste. All roofing materials shall be thoroughly wetted and double-bagged in 6-mil poly bags and goose-necked or thoroughly wetted and wrapped in double-layers of 6-mil poly for proper disposal. All waste shall be properly handled and labeled for disposal by the Contractor. All asbestos-containing and contaminated materials shall be properly handled, stored, transported and disposed by the Contractor in accordance with all Federal, State, and local laws, regulations, ordinances, guidelines, and the requirements of this Specification. Final inspection shall consist of a visual inspection. No final air clearance samples will be required in work areas. See Section 02081 and this specification for more information.

16. **Abatement Activities:** All abatement of asbestos containing materials shall be performed in a proper wetted condition using amended water. Dry removal of asbestos containing materials is not permitted. See Section 01527 and 02081 for more information. The Contractor shall take the necessary precautions to protect all computer, fiber optic and electronic equipment including building sensors from damage during the Contractor's activities and also including, but not limited to, walls, ceilings, floors outside work areas, doors, thresholds, and fixed objects within work area(s). Any damaged painted surfaces shall be repaired at the Contractor's expense.
17. **Decontamination Units:** Three (3) stage decontamination stations (units) will be erected, operated, maintained, and removed by the Contractor. The decontamination stations will be erected in such a manner to allow for a secured entrance during non-working hours. At no time will workers move around outside of the work area without clothing. At no time will equipment be moved out of containment decontamination. The equipment/bag-out room must be used for equipment movements. No "pop-up" portable decontamination units will be allowed unless approved in writing. See Section 01563 for more information.
18. **Bag-Out:** Bag-out activities shall be performed by the Contractor prior to the end of the work day. All waste must be removed from work areas prior to the end of the work day. At no time will the workers be allowed to move around outside of the building in abatement coveralls with exception to bag-out activities, which will occur during approved hours each day. All bags shall be leak-proof and have a "goose-neck" seal and labeling. See Section 01527 for more information.
19. **Air Sampling:** All daily air sampling will be laboratory analyzed by Phase Contrast Microscopy (PCM) methods unless the Owner or State Agency requires other methods. Final air clearance samples will be by Transmission Electron Microscopy (TEM). See Section 02081 and this specification for more information.
20. **Aggressive Air Sampling:** The Contractor shall provide, at no additional cost to the Owner, the leaf blower(s) and fan(s) required by the Owner's Representative to perform proper aggressive air sampling.

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21. **Waste Disposal:** All asbestos-containing materials and contaminated asbestos-containing materials shall be properly handled, stored and disposed by the Contractor at a licensed and permitted landfill. The Contractor shall utilize the landfill written on the bid form for this project. **All non-asbestos-containing or non-asbestos-contaminated wastes shall be properly and safely stored by the Contractor inside of the building at the location identified on Drawing B.** Waste shall be stored in a manner which does not block ingress or egress of the building, rooms, closets, doors or windows and does not pose a fire or safety concern as determined by the Owner or the Owner's Representative.
22. **Lock-Down:** All non-visible asbestos residue shall be encapsulated with a coating of penetrating encapsulant applied in strict accordance with the manufacturer's directions. The Contractor shall schedule the application of lock-down with the Owner's Representative prior to application. See Section 01527 for more information.
23. **Use of Drawings:** All drawings provided in the Specification are diagrammatic, not to proportion and are not to scale. Drawings are provided to the Contractor for reference purposes. The Contractor shall develop and verify the actual quantities and locations required for all of the work and consider these actual quantities when preparing its bid.
24. **Work Areas adjacent to Occupied Areas (if applicable):** When asbestos abatement work areas are adjacent to occupied areas, the Contractor shall install and maintain wooden partitions which extend from floor to ceiling with lockable access doors to prevent occupants from entering into work areas.
25. **Scaffolding, Lifts and Ladders:** If scaffolding is used, the Contractor must erect, use, and disassemble the scaffolding in accordance with OSHA Standards. Additionally, all lifts and ladders shall meet and be used in accordance with OSHA Standards. The Contractor shall insure that floors and all other building components are protected during the use of scaffolding, lifts and ladders. The Contractor shall use only trained personnel when using scaffolding, lifts and ladders.
26. **Exhaust from Negative Air Machines (if applicable):** Windows, doors or other building openings used to exhaust negative air shall be protected by the Contractor by installing plywood and bracing if the opening is located on the first floor or below. The plywood and bracing shall be installed in a manner by the Contractor that prevents damage to the building components and prevents unauthorized access into the building.
27. **Permanent Objects in the Work Area (if applicable):** Where permanently mounted objects are present in the work area, that Contractor shall protect these objects from contamination and damage from their activities. However, window and/or wall mounted HVAC units could contain asbestos-containing materials. The Contractor shall remove covering on HVAC units to inspect, remove and dispose of all asbestos-containing materials included, but not limited to, floor tiles, floor covering, pipe insulation and heat shields.
28. **Electric Power:** All electric power shall be shut down in each work area where possible. The Owner shall provide low voltage temporary electric service (single phase, 120-volt, 100 amp circuit source). The Contractor shall provide the Owner with their specifications within five (5) calendar days prior to scheduling the start of work. The Owner shall provide a plug type outlet within 300 feet of work locations. Adequate extension cords shall be provided by the Contractor. Temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in each work area shall be provided by the Contractor. If required by the Contractor, a licensed electrician shall be provided, at no additional cost, for making electrical connections and disconnections.

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29. **Water Service:** The Owner shall provide limited cold water service for small connections (3/4-inch hose maximum). The Contractor shall provide, at no additional cost to the Owner, all necessary connections and ensure proper back-flow protection. Hot water heaters shall be supplied and operated by the Contractor at no additional cost to the Owner. The Contractor shall be responsible for turning on and off valves at their point of connection.
30. **Visitor Personal Protective Equipment:** The Contractor shall provide, at no additional cost to the Owner, respirators, disposable coveralls, head covers, and foot covers all at new condition.
31. **Contractor Project Staffing:** A minimum of three (3) asbestos personnel are required to be present at the project site at all times. The Contractor's on-site supervisor must be able to make timely decisions for this company. **Prior to any site activity, the Contractor shall submit the name and address of each supervisor, worker and any other person he intends to use at the project site for informational screening (e.g. registered sex offenders list and other lists) by the Owner. The Contractor shall be notified by the Owner if their personnel will be allowed to work at the project site based upon the results of the screening. The Capital School District reserves the right to reject any proposed Contractor personnel for this project.** (Section 01043)
32. **Project Supervisor:** During all asbestos abatement work, a State of Delaware licensed Supervisor, employed by the Contractor, shall be on site at all times. The licensed Supervisor shall maintain all daily records as required.
33. **Project Monitor Must Be On-Site:** The Contractor shall not begin or continue work for any asbestos abatement related activities until a certified Project Monitor is resident on site. The Project Monitor must be on site at all times during asbestos abatement related activities. The Contractor shall provide adequate notice to the Professional Service Firm providing the Project Monitor. Adequate notice is the period of time agreed to by the Contractor and Professional Service Firm.
34. **Damage Repair:** The Contractor shall repair or replace, at his own expense, any damage occurring from his activities for items the Owner desires to save prior to demolition or any building component. Any damaged items will be replaced or paid for by the Contractor prior to receipt of final contract payment.
35. **Stop Work:** If the Owner, or the Owner's Representative presents a written stop work order to the Contractor, the Contractor shall immediately stop all work in a fashion not to create an asbestos exposure hazard to workers, building occupants, or others. See this Section for more information.
36. **Building and Property Usage:** The contractor shall not unreasonably encumber the site with materials or equipment and may be required to share the project site with others. Stockpile of materials at locations after approved by the Owner's Representative. If additional off-site storage is need by the Contractor, the off-site storage will be provided by the Contractor at no additional cost to the Owner. Smoking or open fires will not be permitted within the building. Alcoholic beverages and non-prescription drugs use is prohibited within buildings or on the property. No permanent modifications shall be made to any building component, sidewalk, parking area, signage, or any other appurtenances without expressed written permission from the Owner. See this Section for more information.
37. **Wooden Containment Barriers (barricade):** The Contractor shall install a permanent wooden containment barrier (barricade). The barricade shall be constructed of at least 1/2-inch thick plywood with stud supports capable of preventing intentional and/or accidental entry. Care must be taken not to damage building components. Any damage caused by the Contractor shall be repaired at no additional cost to the Owner.

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- D. Single Prime Contract:** The Work will be constructed under a single prime contract. The Contractor shall not sublet this contract without expressed written permission from the Owner.
- E. Pre-abatement assessment:** A comprehensive pre-abatement assessment will be completed by the Contractor, Owner's Representative, and any other individual authorized by the Owner. An agreed list of damage to structures, surfaces, equipment shall be developed and agreed upon prior to the commencement of work by the Contractor.
- F. Contaminated Areas:** Any areas found to be contaminated in the opinion of the Owner's Representative or Owner after the removal of asbestos containing material shall be decontaminated using a combination of HEPA vacuum and wet cleaning techniques by the Contractor at no additional expense to the Owner.
- G. Plan of Action:** The Contractor shall submit a detailed plan of action which details proposed procedures used for complying with all of the requirements of this specification. Included in the plan shall be the location and layout of decontamination areas, the sequence of asbestos work, the interface of all trades, methods used to ensure safety of the workers, building occupants, and visitors to the site, and a detailed description of methods that will be used to control pollution.
- H. Potential Asbestos Hazard:** The disturbance of asbestos-containing materials may cause asbestos fibers to be released into the building and/or exterior atmosphere thereby creating a potential health hazard to workers, building occupants, and others. The Contractor shall inform all workers, supervisors, subcontractors, and Owner's Representatives who will be at the project site of the seriousness of the hazard and of proper work procedures which must be followed. The Contractor shall, continuously and at all times, take the measures necessary including, but not limited to, procedures, work practices, and methods, to ensure complete compliance with federal, state, and local regulations and eliminate the potential for asbestos exposure.
- I. Site Safety:** The Contractor shall at all times comply with all applicable federal, state and local, laws and regulations, including environmental, health and safety laws and regulations, pertaining to its services. The Contractor represents it is familiar with all aspects of the job site (including but not limited to site conditions and site access limitations) and hazards associated with asbestos removal and abatement. The Contractor shall be solely responsible for the safety of its personnel, subcontractors or any third party in its work areas or common areas and Contractor hereby releases and indemnifies Client and Owner's Representative from any and all claims brought by, or on behalf of itself, its employees or its subcontractors arising out of or in connection with its Contractor's services or presence at the job site. Prior to the start of daily work, and at the conclusion of each day, the Contractor shall visually inspect his work areas and all areas required to access his work areas. Any unsafe conditions found during any inspection shall be reported to the Owner's Representative immediately in writing subsequent to each inspection. The report provided by the Contractor to the Owner's Representative shall adequately describe the unsafe condition and the procedures the Contractor has immediately taken to correct the unsafe condition. The Contractor shall promptly report any and all accidents to the Owner's Representative in writing, and shall include sufficient details regarding the accident and procedures implemented by the Contractor to prevent similar accidents. The Contractor shall be responsible for reporting accidents to the appropriate regulating agency as may be required by applicable law or regulation.

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J. Specification Sections: The work includes the removal of asbestos-containing materials according to the requirements provided in the following specification sections:

1. General and Administrative Requirements:
 - 01013: Summary of the Work–Asbestos Abatement
 - 01043: Project Coordination–Asbestos Abatement
 - 01097: Reference Standards and Definitions–Asbestos Abatement
 - 01098: Codes, Regulations and Standards–Asbestos Abatement
 - 01301: Submittals–Asbestos Abatement
 - 01601: Materials and Equipment–Asbestos Abatement
 - 01632: Product Substitutions–Asbestos Abatement
 - 01701: Contract Closeout–Asbestos Abatement
2. Abatement Work:
 - 01503: Construction Facilities and Temporary Controls–Asbestos Abatement
 - 01513: Temporary Pressure Differential & Air Circulation System
 - 01526: Temporary Enclosures
 - 01527: Regulated Areas
 - 01529: Mini Enclosures and Glovebags
 - 01560: Worker Protection–Asbestos Abatement
 - 01562: Respiratory Protection
 - 01563: Decontamination Units
3. Asbestos Removal Work Procedures:
 - 02081: Removal of Asbestos-Containing Materials
 - 02084: Disposal of Regulated Asbestos Containing Material
 - 02085: Resilient Flooring Removal-Resilient Floor Covering Manufacturers
 - 02087: Resilient Flooring Removal-Aggressive Asbestos Abatement
4. Decontamination of Work Areas:
 - 01711: Project Decontamination
 - 01712: Cleaning and Decontamination Procedures

1.3 WORK SEQUENCE

A. The Work will be conducted in distinct phases at each abatement location.

1. Each work phase shall consist of pre-cleaning, establishing of work areas, installation of engineering controls, abatement, post abatement inspection and sampling.
2. The following inspections will be performed by the Contractor and Owner's Representative simultaneously for project activities:
 - a. Pre-Cleaning: A visual inspection of all pre-cleaned surface areas. This inspection will occur prior to the installation of polyethylene sheeting on walls, floors, and other surfaces. Decontamination units must be operable and critical barriers installed prior to pre-cleaning activities.
 - b. Work Area: Work areas will be visually inspected each day prior to the start of work activities and upon work completion each day to insure that the integrity of the containment is in compliance with these specifications. This inspection does not relieve the Contractor of their responsibilities of performing the work in

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accordance with these specifications.

- c. Post Abatement: A visual inspection of each work area will be performed following successful clearance air sampling and prior to commencing containment tear-down.
- d. Substantial Completion: After completion of all applicable demolition, reinsulation, cleaning, and all other asbestos abatement activities, a final inspection will be performed after final cleaning of all work areas prior to re-occupancy of said areas by the Owner.

1.4 ASBESTOS-CONTAINING MATERIALS:

- A. **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's Representative, other employers and employees about the location and quantity of the ACM or PACM immediately upon discovery.
- B. The following asbestos containing building materials are known to be present at the worksite. If the Contractor finds any other material which are suspected of containing asbestos, the Contractor shall immediately notify the Owner's Representative.
 - 1. Roofing 2 % to 25 % Chrysotile.
 - 2. Transite Panels 30 % Chrysotile.
 - 3. Window Glazing 5 % to 7 % Chrysotile.
 - 4. Floor Tile and Linoleum 2 % to 20 % Chrysotile.
 - 5. Pipe Insulation 4 % Chrysotile.

1.5 ASBESTOS HEALTH RISK:

- A. The disturbance or dislocation of ACM may cause asbestos fibers to be released into the building's atmosphere, thereby creating a potential health risk to workers and building occupants. The Contractor shall inform all workers, supervisory personnel, subcontractors and Owner's Representatives who will be at the job site of the seriousness of the risk and of proper work procedures which must and will be followed.
- B. Where in the performance of the work, workers, supervisory personnel, subcontractors, or Owner's Representatives 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.

1.6 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

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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. Use of Existing Elevators (if applicable):** Except for the Freight Elevator, use of elevators by the Contractor will not be permitted. The Contractor will be permitted to use the freight elevator for temporary freight service and the transportation of construction personnel during the construction period. This elevator must also be available to the Owner at all times; coordinate freight elevator usage with the Owner or Owner's Representative. Provide protective pads for the elevator car and other appropriate protective measures for the car and entrance doors and frames. During asbestos abatement activities the car is to be protected as set forth in the Division 1 Section on Temporary Enclosures.
 - 2. Smoking:** Smoking or open fires will not be permitted within the building enclosure or on the premises.
 - 3. Toilet Rooms (if applicable):** 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.

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

1.8 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.

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- 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 which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

- 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 work of the Contractor and is not covered in this section

1.9 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 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:

$$\text{Volume} = \frac{\left(\frac{\text{Number of Fibers}}{\text{Area of 100 fields}} \right) \times \text{Total Filter Area}}{\left(\frac{\text{Limit Value}}{4} \right)}$$

Where:

- Number of fibers = 5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm² on the filter
- Area of 100 fields = 0.785mm²
- Total Filter Area = 385mm²
- 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/mm² on the filter or 5 fibers/100 fields.

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- 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. Baseline:

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

- 2. **PCM Samples**

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

- 3. **TEM Samples:**

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

- 4. **Baseline:** 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.

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

1.10 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.

1.11 LABORATORY TESTING BY OWNER

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- A. **The services of a testing laboratory** may be employed by the Owner or Owner's Representative to perform laboratory analyses of the air samples. Samples available for analysis will be sent daily by 5:00 pm from Dover via a carrier for next day delivery to the laboratory, so that verbal reports on air samples can be obtained within 24 hours after receipt by the laboratory.
- B. **A complete record** of all air monitoring and results will be furnished to the Owner's Representative, the Owner, and 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.
- E. **Additional laboratory samples and professional services time required for re-sampling** of areas for clearance due to failed samples because of the Contractor's activities will be paid for by the Contractor.

1.12 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 Owner or Owner's Representative 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.

1.13 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. A NIOSH-582 certified microscopist will be on-site during the afternoon hours to provide analysis of available PCM samples by NIOSH Method 7400. Verbal report on air samples will be provided that day.

1.14 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.

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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SITE WORKERS

- A. All workers and supervisors shall be currently certified by the State of Delaware and have their State of Delaware issue badge with them at all times while at the project site.
- B. All workers and supervisors shall have a copy of their current medical and respirator fit test documentation at all times while at the project site.
- C. The Contractor shall provide, at all times during any site activities, at least three (3) site workers which includes at least one (1) certified Supervisor and two (2) certified workers. The certified Supervisor shall remain on the outside of the work area as required.
- D. Prior to the start of work, the Contractor shall submit the level of respiratory protection intended for each operation of the project on the Initial Exposure Assessment form (See Section 01562).
- E. A signed copy of the Certificate of Workers Acknowledgement must be obtained from each site worker including supervisors prior to the start of work. (See Section 01530).

3.2 MINIMUM PERSONAL PROTECTION EQUIPMENT

- A. **All site workers engaged in asbestos abatement activities shall use, at all times and as a minimum, PAPR respiratory protection equipment.**

3.3 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 or 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 or Owner's Representative.

Table 1. Action Level and Stop Action Fiber Concentrations.

ACTION LEVEL (Max Exposure) (f/cc)	STOP LEVEL (f/cc)	RESPIRATOR	RESPIRATOR ASSIGNED PROTECTION FACTOR
1	0.5	Half Face	10
100	50	PAPR	1000
100	50	Supplied Air, Pressure Demand	1000

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1. If airborne fiber counts inside contained work areas exceed the stop level for any period of time cease all work except corrective action until fiber counts fall below the stop level and notify 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 or Owner's Representative.
 2. The Contractor shall stop work immediately if any visual emissions are observed.
- B. Outside Work Area:** If any air sample taken outside of the Work Area exceeds the baseline established in Part 1 of this section, immediately and automatically stop all work except corrective action. The Owner or 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 or Owner's Representative.
 3. The Contractor shall stop work immediately if any visual emissions are observed.
- C. Effect on Contract Sum:** Complete corrective work with no change in the Contract Sum if high airborne fiber counts were caused by Contractor's activities. The Contract Sum and schedule will be adjusted for additional work caused by high airborne fiber counts beyond the Contractor's control.

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3.4 STOP WORK

- A. If the Owner, Owner or Owner’s Representative, or Project Administrator** presents a written stop work order, immediately and automatically conform to that stop work order, while maintaining temporary enclosures and pressure differential. Do not recommence abatement work until authorized in writing by Owner, Owner, or Owner’s Representative or Project Administrator.
- B. Immediately initiate the following actions:** After being presented with a stop work order immediately:
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.
- C. Do not recommence work** until authorized in writing by the Owner or Owner’s Representative.

3.5 SCHEDULE OF ASBESTOS-CONTAINING MATERIALS

See the attached Table 1. and Table 2. for approximate quantities and locations for asbestos-containing materials on the project. All quantities were estimated. The Contractor shall field verify said quantities without delay and immediately inform the Owner’s Representative of any discrepancies.

END OF SECTION - 01013