

TECHNICAL SPECIFICATIONS

for

GENERAL ENVIRONMENTAL REMEDIATIONS

DOCUMENT - COST ITEMIZATION

Unit Cost Extended Description

DIVISION 1 - GENERAL REQUIREMENTS

- 01013 Summary of Work
- 01043 Project Coordination
- 01092 Codes, Regulations, and Standards
- 01503 Temporary Facilities
- 01513 Temporary Pressure Differential & Air Circulation System
- 01526 Regulated Areas
- 01561 Worker Protection
- 01562 Respiratory Protection
- 01563 Decontamination Units/Tunnels
- 01712 Project Decontamination/Other Contaminants
- 01714 Work Area Clearance

DIVISION 13 - SPECIAL CONSTRUCTION

- 13283 Remediation of Mold-Contaminated Materials

DIVISION 15 – MECHANICAL

- 15890 Duct Work

APPENDIX A – PROJECT DRAWINGS

Decontamination Units:

- A-1 5-Stage Decontamination Unit
- A-2 3-Stage Decontamination Unit
- A-3 2-Stage & 1-Stage Mini Decontamination Units
- A-4 Material Decontamination Unit
- A-5 Combined Personnel/Material Decontamination Unit

Tunnel Construction:

- A-6 Full/Partial Tunnel - Wood
- A-7 Full/Partial Tunnel – Soft

Relocatable Building Containment:

- A-8 Containment Floor Plan
- A-9 Containment Section

COST EXTENDED DESCRIPTION

BASE BID UNIT PRICES

The Base Bid Unit Prices, for the removal and disposal of mold contaminated materials, as well as other environmental contaminants, shall include all labor, materials, and equipment necessary for the complete execution of the work, except as specifically indicated otherwise. The removal activities include, but are not necessarily limited to, the following:

GENERAL

1. ISOLATION OF THE WORK AREA - INCLUDING INSTALLATION AND REMOVAL OF ALL BARRIERS (MULTIPLE LAYERS), AND SEALS FOR REGULATED AREAS – MAJOR OR MINOR.
2. POSTING OF ALL WARNING SIGNS AND INSTALLATION OF BARRICADES.
3. NEGATIVE PRESSURE DIFFERENTIAL EQUIPMENT & MONITORS.

PERSONNEL PROTECTION

1. ALL PROTECTIVE EQUIPMENT AND PROCEDURES.
2. STANDARD AND POWERED AIR-PURIFYING RESPIRATORS.
3. TYPE "C" AIR RESPIRATORS AND SUPPLIED AIR SYSTEMS.

REMOVAL OF CONTAMINANTS PER SPECIFICATIONS, COMPLETE CLEANING BEFORE, DURING, AND AFTER ABATEMENT / OTHER ENVIRONMENTAL REMEDIATION

1. ALL REQUIRED CLEANING OF ISOLATED WORK AREAS.
2. RE-CLEANING FOR FAILED CLEARANCE
3. FINAL CLEANING, REMOVAL OF POLY SHEETING AND HEPA-VACUUMING.
4. REMOVAL OF DECONTAMINATION STATION(S)

ENCAPSULATION / SEALING / SANITIZING - PER SPECIFICATIONS, COMPLETE

1. MOLD REMEDIATION & CLEANUP - SANITIZER/ANTI-MICROBIAL PAINT.
2. HVAC SYSTEM OR COMPONENTS – SANITIZER.
3. INDOOR AIR QUALITY BUILDING – SANITIZER.

DISPOSAL OF ENVIRONMENTAL WASTE

1. BAGGING OR WRAPPING OF CONTAMINANTS PER SPECIFICATIONS.
2. HANDLING OF DISPOSAL BAGS, WRAPPED WASTE AND DRUMS (WHEN REQUIRED) FROM WORK AREA FOR DISPOSAL.

3. DISPOSAL OF MOLDY WASTE AS CONSTRUCTION DEBRIS, AND OR DISPOSAL OF WILDLIFE WASTE OR OTHER ENVIRONMENTAL WASTE AS REQUIRED.

TRUCK/DUMPSTER/TRANSPORTATION OF ENVIRONMENTAL WASTE

1. ALL TRANSPORTATION TO LANDFILL OR CONTRACTOR’S OWN DUMPSTER OFF SITE.
2. ALL DISPOSAL COSTS (INCLUDING COST OF DUMPSTER), (DELIVERY, PICKUP, OR RE-LOCATION COST).

*ALL OTHER LABOR, PROCEDURES, MATERIALS, TOOLS, AND EQUIPMENT, IN ACCORDANCE WITH CONTRACT DOCUMENTS AND AS REQUIRED TO COMPLETE THE WORK, SHALL BE INCLUDED IN THE UNIT PRICES FOR REMOVAL AND DISPOSAL OF MOLD-CONTAMINATED MATERIALS AND OTHER ENVIRONMENTAL CONTAMINANTS. IN ADDITION, THE CONTRACTOR SHALL MAKE ANY REPAIRS TO EXISTING SURFACES DAMAGED AS A RESULT OF ABATEMENT OPERATIONS, RESTORING EXISTING MATERIALS TO ORIGINAL CONDITIONS.

ADDITIONAL COST UNIT PRICES The additional unit prices listed below are for specific items of work to be performed in addition to, or in excess of, the scope of work of the Base Bid Unit Prices. These items are exclusive of removal or remediation activities only to the extent of their definition and of Base Bid itemized exceptions below and shall in no way relieve the contractor of his obligations under the Base Bid Unit Prices. These items apply to all mold and other environmental work.

Additional Cost Unit Prices, which are specific exclusions from the scope of the Base Bid Unit Prices shall be as follows:

1. Initial Mobilization w/first decontamination unit, including electrical panel.
2. Additional decontamination units, including electrical panel (in excess of Initial Mobilization to site).
3. Emergency Response surcharge (Mobilization to site within 24 hours or 48 hours).
4. Work Difficulty Multiplier for work Identified outside the normal scope of work
5. Additional equipment and or material cost Not in Contract (NIC).
6. Additional equipment cost for Special Projects in excess of the Bid Unit Price.
7. Additional Barrier Protection – Soft or Hard.

A. UNIT PRICES/MOBILIZATION/MISCELLANEOUS COSTS

1. INITIAL MOBILIZATION

Item No.	Description	Unit
A1a	Initial Mobilization – Including Five-Stage Decon (shower & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Project
A1b	Initial Mobilization – Including Three-Stage Decon (shower & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device, if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Project
A1c	Initial Mobilization – Including Three-Stage Decon (dry & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device, if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Project
A1d	Initial Mobilization – Including 2 Stage Mini Decon (wood), GFCI temporary power hookup & removal and plug lockout device, if required or	Per Project

	GFI protected receptacles. (includes all required components to install and remove temporary power hookup, includes extension power cords).	
A1e	Initial Mobilization – Including 2 Stage Mini Decon (poly), GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Project
A1f	Initial Mobilization – Including 1 Stage Mini Decon (poly or wood), GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Project
A1g	Initial Mobilization – (No Decon), including poly door flaps and wash station @ room entrance, GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup, 6'x 6' floor poly decontamination station, and 5 gallon bucket for decontamination, includes extension power cords).	Per Project

2. ADDITIONAL DECONTAMINATION UNITS IN EXCESS OF THE INITIAL MOBILIZATION TO SITE

*All Decons, Decontamination areas, Initial or Re-mobilization to the site shall include Warning Signs and Barricade Tape to demarcate and control access to the Regulated Work Area(s) as required by OSHA 29 CFR-1926-1101.

Item No.	Description	Unit
A2a	Additional Five-Stage Decon (shower & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2b	Additional Three-Stage Decon (shower & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device, if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2c	Additional Three-Stage Decon (Dry & loadout), GFCI electric panel, temporary power hookup and removal and plug lockout device, if required. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2d	Additional Two Stage Mini Decon (wood), GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2e	Additional Two Stage Mini Decon (poly or Pop-up), GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2f	Additional One Stage Mini Decon (poly or Pop-up or wood), GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup, includes extension power cords).	Per Decon
A2g	Additional Decontamination Station, including poly door flaps @ room entrance GFCI temporary power hookup & removal and plug lockout device, if required or GFI protected receptacles. (includes all required components to install and remove temporary power hookup) 6'x 6' floor poly decontamination station, and 5 gallon bucket for decontamination, includes extension power cords)	Per Decon

3. EMERGENCY RESPONSE (Mobilization to site within 24 hours or 48 hours)

Item No	Description	Unit
A3a	Emergency Response Surcharge - Priority 1	Per Job
A3b	Emergency Response Surcharge - Priority 2	Per Job
A3c	Emergency Response Surcharge - Priority 3	Per Job

4. ADDITIONAL EQUIPMENT COST

Item No.	Description	Unit
A4a	Additional temporary power GFCI panel installation temporary power hookup and removal and plug lockout device, if required. (Includes all required components to install and remove temporary power hookup) (Includes Extension Power Cords)	EA
A4b	Generator (6500 watts) Receipts for fuel required	Per Day (24 hours)
A4c	Generator (6500 watts) Receipts for fuel required	Per Week (7 days)
A4d	Generator (6500 watts) Receipts for fuel required	Per Month (31 days)
A4e	Pressure Washer (3500 - 4400 PSI Min) Receipts for fuel required	Per Day (24 hours)
A4f	Pressure Washer (4400 PSI Min) Receipts for fuel required	Per Week (7 days)
A4g	Pressure Washer (4400 PSI Min) Receipts for fuel required	Per Month (31 days)
A4h	Steam Carpet Extractor & Upholstery Cleaner	Per Day (24 hours)
A4i	Steam Carpet Extractor & Upholstery Cleaner	Per Week (7 days)
A4j	Steam Carpet Extractor & Upholstery Cleaner	Per Month
A4k	Scaffold 15' High 5" x 7'	Per Day (24 hours)
A4l	Scaffold 15' High 5" x 7'	Per Week (7 days)
A4m	Scaffold 15' High 5" x 7'	Per Month (31 days)
A4n	Equipment for Bio-Hazard Cleaning - Hydroxide Generator	Per Day (24 hours)
A4o	Truck mount desiccant dehumidifier	Per hour
A4p	Dehumidifier- Desiccant 500-700 CFM	Per Day (24 hours)
A4q	Dehumidifier- Desiccant 1000-2500 CFM	Per Day (24 hours)
A4r	Dehumidifier- Desiccant 5000-8900 CFM	Per Day (24 hours)
A4s	Air Movers	Per Day (24 hours)
A4t	Air Scrubbers Small	Per Day (24 hours)
A4u	Air Scrubbers Large	Per Day (24 hours)
A4v	O-zone devices	Per Day (24 hours)
A4w	Truck Mounted Water Extractor	Per Day (24 hours)
A4x	Truck Mounted Water Extractor	Per Week (7 days)
A4y	Truck Mounted Water Extractor	Per Month (31 days)

5. ADDITIONAL BARRIER PROTECTION

Item No.	Description	Unit
A5a	Soft Barrier 6mil Poly - Install and remove Poly (20' x 100' roll) (In excess of Base Bid Containment Barriers) (For all applications, when authorized by D.E.M)	Per Roll
A5b	Soft Barrier - Install and remove Poly barrier on wood stud framing (4' o.c. max.) (In excess of Base Bid Containment Barriers) (For interior use only, when authorized by D.E.M)	Per Sf

A5c	Curtain Barrier (No Wood Framing) - Install and remove only curtain, suspended from ceiling or wire supports. (In excess of Base Bid Containment Barriers) (For interior use only, when authorized by D.E.M)	Per SF
A5d	Reinforced 6 mil poly - Install and remove Soft or Curtain barrier as required. (20' x 100' roll) (In excess of Base Bid Containment Barriers)	Per Roll
A5e	Hard Barrier - Install and remove Plywood min 4' x 8' x 5/8" & Poly barrier on 2' x 4' wood stud framing (4' o.c. max.) (Used as primary barrier wall) (In excess of Base Bid Containment Barriers)	Per SF
A5f	Soft Barrier Full Containment: Two sides & poly roofs. Install and remove poly containment cross- section* to connect multiple work areas. Tunnel must be free standing with a height between 8'-0" and 10'-0" with a minimum width of 4'-0", unless otherwise specified. *Cross-section shall consist of a 6 mil poly sheeting on sides and roof of 2 x 4 wood framing @ 4' o.c., to form an air-tight barrier, as required by Section 01526. (See detail, these Specifications) (For interior use only, when authorized by County)	Per LF
A6g	Soft Barrier Partial Containment One side & poly roof. Install and remove poly containment cross- section* to connect multiple work areas. Containment must be free standing with height between 8'-0" and 10'-0" with a minimum width of 4'-0", unless otherwise specified. *Cross-section shall consist of a 6 mil poly sheeting on sides and roof of 2 x 4 wood framing @ 4' o.c., to form an air-tight barrier, as required by Section 01526. (See detail, these Specifications) (For interior use only, when authorized by County)	Per LF
A5h	Hard Barrier Full Containment Two Wood Sides & Wood Roof Install and remove Hard Barrier with two wood sides, wood roof and poly barriers. Plywood 4' x 8' x 5/8" on 2' x 4' wood stud framing (4' o.c. max.) required to connect multiple work areas. Containment must be free standing with a height between 8'-0" and 10'-0" with a minimum width of 4'-0", unless otherwise specified. (Used as primary barrier wall), (In excess of Base Bid Containment Barriers) As required by Section 01526 Regulated Work Areas (See Appendix B – Project Drawings)	Per LF
A5i	Containment Partial Two Sides Wood & Poly (6 mil min) Roof. Install and remove Hard Barrier with poly roof. Plywood 4' x 8' x 5/8" on 2' x 4' wood stud framing (4' o.c. max.)	Per LF
A5j	Containment Partial One Side Wood & Wood Roof. Install and remove Hard Barrier with poly roof. Plywood 4' x 8' x 5/8" on 2' x 4' wood stud framing (4' o.c. max.)	Per LF
A5k	Containment Partial One Side & Poly Roof. Install and remove Hard Barrier with poly roof. Plywood 4' x 8' x 5/8" on 2' x 4' wood stud framing (4' o.c. max.)	Per LF
A5l	Relocatable Building Enclosure (Hard Barrier Floors, Walls & Ceilings) Install and remove hard barrier with 2 wood sides, wood roof, and poly (6 mil min) barriers. Plywood Floor with riser for building skirting. Plywood 4' x 8' x 5/8" on 2' x 4' wood stud framing (4' o.c. max.) Required to enclose exterior of relocatable building, to abate ACBM, wildlife, or remediate mold-contaminated wall materials. Enclosure must be freestanding, with a minimum wall height of 8'-0" and a height of 13'-0" at the relocatable building wall. Enclosure shall have a minimum interior width of 6'-0" with plywood floor 5/8". Roof shall consist of alternating plywood. panels &	Per LF

	poly barriers (Used as primary barrier wall), (In excess of Base Bid Containment Barriers). As required by Section 01526 Regulated Work Areas (See Appendix B – Project Drawings)	
A5m	Inspection Window - Construction and installation of 2' x 2' Inspection Window in Hard/Soft Barrier to allow observation of the work area from outside of containment. (In excess of Base Bid Containment Barriers)	Per Window
A5n	Ramboard Floor Protection – installation of Ram Board or equivalent to cover/protect floors that are not part of the remediation	Per SF

B. MOLD ABATEMENT CLEANING ACTIVITIES- SURFACE CLEANING/REMDIATION

1. MOLD SURFACE CLEANING AND SURFACE PREPARATION

Unit cost include the following but are not limited to the following: All labor & Equipment, HEPA Vacuuming, wet-wiping and cleaning of related surfaces using a detergent solution, decontamination, and sanitizing.

Item No.	Description	Unit
B1a	Mold Surface (Spot) Cleaning and decontamination of items and surfaces. Including but not limited to surfaces such as: lights (all sizes, bulbs, includes interior, exterior components, and light covers), floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges.	Per SF
B1b	Mold General Clean-up Heavy FF&E/Storage (All Surfaces <1000 SF. All Horizontal and Vertical surfaces, including but not limited to surfaces such of floor plane as: lights (all sizes, bulbs, includes interior, exterior components, of floor plane and light covers), floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For Work Areas less than <1000 SF)	Per SF of Floor Plane
B1c	Mold General Clean-up Heavy FF&E/Storage (All Surfaces >1000) HEPA Vacuum and wet-wipe all surfaces/ledges using a detergent solution. All Horizontal and Vertical surfaces, including but not limited to surfaces such of floor plane as: lights (all sizes, bulbs, includes interior, exterior components, and light covers), floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For Work Areas less than >1000 SF)	Per SF of Floor Plane
B1d	Mold General Clean-up (All Surfaces <1000 SF) All Horizontal and Vertical surfaces, including but not limited to surfaces such as: lights (all sizes, bulbs, includes interior, exterior components, and light covers), of floor plane floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For Work Areas less than <1000 SF)	Per SF of Floor Plane
B1e	Mold General Clean-up (All Surfaces > 1000 SF) All Horizontal and Vertical surfaces including but not limited to surfaces such as: lights (all sizes, bulbs, includes interior, exterior components, and light covers),of floor plane floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For Work Areas greater than >1000 SF)	Per SF of Floor Plane
B1f	Mold General Clean-up (Horizontal Surfaces < 1000 SF) All Horizontal surfaces including but not limited to surfaces such as: lights (all sizes, bulbs, includes interior, exterior components, and light covers),of floor plane floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For Work Areas less than < 1000 SF)	Per SF of Floor Plane
B1g	Mold General Clean-up (Horizontal Surfaces > 1000 SF) All Horizontal surfaces including but not limited to surfaces such as: lights (all sizes, bulbs, includes interior, exterior components, and light covers), of floor plane floors, walls, furniture, shelves, beams, A/C supply or return vents, ducts, pipes, ledges. (For	Per SF of Floor Plane

	Work Areas greater than >1000 SF)	
B1h	Mold General Clean-up (Remove & Reinstall) HVAC Supply/Return Vents Remove, clean, and reinstall A/C vents and diffusers. (Return & or supply all sizes) (Includes cleaning 12" into duct interior & supply or return vent covers).	Per Vent
B1i	Mold General Clean-up Seating	Per Seat
B1j	Anti-Microbial Paint Application Surface Preparation/Encapsulation of work areas or containment item surfaces. (Includes surfaces such as: floors, walls, wall cavities, studs, furniture, shelves, beams, A/C supply or return ducts, pipes, ledges, and or other items as required).	Per SF
B1k	Anti-Microbial Paint Airless Application Surface Preparation/Encapsulation of work areas or containment item surfaces. (Includes surfaces such as: floors, walls, wall cavities, studs, furniture, shelves, beams, A/C supply or return ducts, pipes, ledges, and or of floor plane other items as required).	Per SF of Floor Plane

2. MOLD REMEDIATION

Unit cost include the following: all labor & equipment, HEPA Vacuuming, wet-wiping and cleaning of related surfaces using a detergent solution, decontamination, and sanitizing.

Item No.	Description	Unit
B2a	Remove Mold Contaminated Acoustic Ceiling Tile (Grid Remains) Removal of ceiling tile only, Grid remains in place, but is cleaned, and repaired if damaged by the removal process (all sizes of suspended tile).	Per SF
B2b	Remove Mold Contaminated Flooring (tile, Wood, lvt, lvp etc.) Remove entire floor system, including all layers of resilient flooring, base and moldings, mastic, plywood backing, felt/vapor barrier and including the wood substrate.	Per SF
B2c	Remove Mold Contaminated Carpet (Glue-Down Installation) Remove baseboards, moldings, mold contaminated glue down carpet. Includes removal of glue from all substrates.	Per SF
B2d	Remove Mold Contaminated Carpet (Tack & Padding Installation) Remove baseboards, moldings, mold contaminated carpet and Padding. Includes removal of carpet tackles, padding and padding adhesive from all substrates.	Per SF
B2e	Remove Mold Contaminated Drywall (Excludes Framing) Remove baseboards, moldings, mold-contaminated drywall all sizes/ Multiple layers on furring or framing system. (furring/framing remains)	Per SF
B2f	Remove Mold Contaminated Wall or Ceiling Coverings Remove baseboards, moldings, mold-contaminated Coverings, additional layers, (ceramic tile, vinyl wall coverings, plastic paneling, wood or plywood panels, over plaster or drywall to remain).	Per SF
B2g	Remove Mold Contaminated Batt or Board Insulation Remove mold-contaminated insulation, batt or board, wall or ceiling insulation.	Per SF
B2h	Remove Mold Contaminated HVAC Duct Insulation – Duct Remains Remove mold-contaminated insulation (All Sizes) Duct remains (Complete removal of Insulation, mastics, pins and washer-cap)	Per SF
B2i	Remove - Drop Mold Contaminated HVAC Ductwork Assembly Remove - Drop mold-contaminated HVAC Ductwork assembly in one piece with duct insulation (All Sizes) and ACBM mastic complete removal.	Per LF
B2j	Remove Mold Contaminated Cabinetry or Shelving Assembly Remove and decontaminate cabinets, casework and FF&E affixed to surfaces	Per LF

B2k	Surface Fogging/Misting, Occupied Spaces, Mechanical or HVAC Systems Provide Antimicrobial or Surface Treatments for air and surface Treatments as required for disinfection and decontamination of surfaces to Neutralize airborne biohazards.	Per SF of floor plan
B2l	Removal of Mold Contaminated Substrate Remove mold contaminated floor substrate.	PER SF
B2m	Remove Mold Contaminated Specialized Drywall (Excludes Framing) Remove baseboards, moldings, mold-contaminated drywall all sizes/ Multiple layers on furring or framing system. (furring/framing remains)	Per SF

c. WATER DAMAGE REMEDIATION

1. EXTRACTION, DRYOUT, & REMEDIATION

Item No.	Description	Unit
C1a	Water Extraction: Category 1 Remove all excess water from all surfaces.	SF
C1b	Water Extraction: Category 2 Remove all excess water from all surfaces.	SF
C1c	Water Extraction: Category 3 Remove all excess water from all surfaces.	SF
C1d	Dry Out Dry out all surfaces to meet “Dry” standards found in the Detailed Specifications. This shall include evaporation and dehumidification as found in the Detailed Specifications.	SF
C1e	Remove Water Saturated Drywall (Excludes Framing) Remove baseboards, moldings, drywall all sizes/ Multiple layers on furring or framing system. (furring/framing remains)	SF
C1f	Remove Water Saturated Wall or Ceiling Coverings Remove baseboards, moldings, mold-contaminated Coverings, additional layers, (ceramic tile, vinyl wall coverings, plastic paneling, wood or plywood panels, over plaster or drywall to remain).	SF
C1g	Remove Water Saturated Batt or Board Insulation Remove insulation, batt or board wall or ceiling insulation.	SF
C1h	Remove Water Saturated HVAC Duct Insulation – Duct Remains Remove insulation (All Sizes) Duct remains (Complete removal of Insulation, mastics, pins and washer-cap)	SF
C1i	Remove Water Saturated Acoustic Ceiling Tile (Grid Remains) Removal of ceiling tile only, Grid remains in place, but is cleaned, and repaired if damaged by the removal process (all sizes of suspended tile).	SF
C1j	Remove Water Saturated Flooring (tile, Wood, lvt, lvp etc.) Remove entire floor system, including all layers of resilient flooring, base and moldings, mastic, plywood backing, felt/vapor barrier and including the wood substrate.	SF
C1k	Remove Water Saturated Carpet (Glue-Down Installation) Remove baseboards, moldings, d glue down carpet. Includes removal of glue from all substrates.	SF
C1l	Remove Water Saturated Carpet (Tack & Padding Installation) Remove baseboards, moldings, carpet and Padding. Includes removal of carpet tack strips, padding and padding adhesive from all substrates.	SF
C1m	Removal of Water Saturated Substrate Remove water saturated floor substrate.	SF
C1n	Remove Water Saturated Specialized Drywall (Excludes Framing)	

	Remove baseboards, moldings, mold-contaminated drywall all sizes/ Multiple layers on furring or framing system. (furring/framing remains)	SF
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SECTION 01013 SUMMARY OF THE WORK

PART 1 - GENERAL

1.01 RELATED WORK:

a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.

1.02 PROJECT DESCRIPTION

a. TERM BID:

1. The Work involves the remediation of mold, and other environmentally hazardous materials at various facilities. The Work will be performed under a Term Bid, to be in effect for a term of three (3) years. There shall be no guaranteed minimum work assigned under the contract. The Bid will be made on the basis of Unit Prices for the different items of work to be performed.

b. SCOPE OF WORK:

1. The Scope of Work also includes the cleanup, excess water removal, dry out, remediation and disposal of water saturated materials, mold and mold-contaminated materials, pigeon, bat or other animal waste, as well as other environmental contaminants.

c. PURCHASE ORDER (P.O.):

1. The Work will be issued by the County through individual work orders, priced according to the established Unit Prices. Each job will be issued a separate work order, known as a "Purchase Order", in accordance with of the terms and conditions of the Agreement.

2. The P.O. will be designed by the County each time a particular work item is to be accomplished. The P.O. will note, among other things, the specific scope and locations of the work and procedures particular to that location for the accomplishment of the work, in accordance with Agreement.

d. ADDITIONAL REQUIREMENTS:

1. The Work may be referenced in other documents, including: the Contract, Special Conditions, Supplementary Conditions, Addenda and Modifications to the Contract Documents issued subsequent to the initial printing of this project manual. The Work may also be referenced in printed material referenced by any of these. Work of the Contract may also be unavoidably affected or influenced by governing regulations, natural phenomena including weather conditions, and other forces outside the Contract Documents.

1.02 POTENTIAL ENVIRONMENTAL HAZARDS:

a. The disturbance or dislocation of mold containing materials, as well as of animal waste and other

environmental contaminants, may cause, mold spores, bacteria or other chemical or biological contaminants to be released into the building's atmosphere, thereby creating a potential health hazard to workmen and building occupants. The contractor shall apprise all workers, supervisory personnel, subcontractors and others who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

b. 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 potentially toxic/hazardous materials, the contractor shall take appropriate continuous measures, as necessary to protect all building occupants from the potential exposure to said hazards. Such measures shall include the procedures and methods described herein, as well as full compliance with regulations of applicable federal state and local agencies.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 PHASING OF WORK:

a. The contract may require work to be performed in phases. The timing and exact work dates shall be coordinated with the County Project Manager.

3.02 TIMING OF THE WORK:

a. The Project shall be completed within the time schedule and duration specified in the P.O.. The contractor shall schedule all manpower, equipment and methods necessary to perform the work in said time frame, including but not limited to the use of multiple simultaneous phases/work areas.

3.03 WORK TIME FRAMES:

a. Standard work schedule for the term of this contract will be Monday through Friday, 6:30 am. to 5:00 pm. After 5:00 P.M., Contractor may continue daily work activities which do not require progress inspections by the County Project Manager, provided that the facility staff are present on their regular work shift and prior notice is given to the County Project Manager. County Project Manager inspections shall be scheduled between 6:30 am. to 5:30 pm. No Work, including preparation, shall commence without prior notice to proceed (pre-inspection approval) from the County Project Manager. No abatement/remediation work shall commence prior to the Project Managers field inspection and acceptance of conditions.

b. If the contractor elects to work after the normal operating work hours, solely for the benefit of the contractor, the cost for project coverage will be paid for by the contractor. At the County's option, an accelerated schedule, including after hours, weekend, and/or holiday work, may be required to accommodate specific project requirements. Work scheduled for after hours, weekends, and holidays will be specified based on individual project needs, at the convenience of the County. In such cases, custodial and County Project Manager coverage costs will be borne by the County. Unit prices listed in the Form of Proposal apply to work to be performed under both Standard Work Schedules and Accelerated Work Schedules

END OF SECTION

SECTION 01043 PROJECT COORDINATION

a. The General Provisions of the Contract, including Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.

1.02 SUMMARY:

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

1. Administrative and supervisory personnel.
2. Preconstruction Meeting.
3. Pre-Remediation Condition Inspection.
4. Daily Log.
5. Special Reports.
6. Contingency Plans.
7. Notifications to other entities at the job site.

1.03 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

a. General Superintendent/Supervisor: Provide a full-time Project Supervisor who shall be experienced in the administration, removal and supervision of mold remediation, depending on the material to be remediated including Work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Competent Person as required by OSHA in 29 CFR 1926.1101 and is the Contractor's Representative responsible for compliance with all applicable federal, state and local regulations, particularly those relating to mold, as specifically required. This person must have successfully completed the following courses:

Mold:

1. 4-day course on mold remediation supervision and Florida mold remediator license per FS 468.84
2. 14-hrs continuing education & license renewal every two years.

These courses must be approved by the Florida Department of Environmental Protection (DEP) and these requirements shall be in accordance with Florida Statutes 468 and 469.

b. All other On-Site Personnel: All personnel that will work on mold remediation/cleanup projects must have certification as a mold worker in accordance with EPA guidelines and State requirements.

1.04 PRECONSTRUCTION MEETING:

a. An initial progress meeting recognized as the "Preconstruction Meeting" will be convened, at the option of the Owner's Representative, prior to start of any Work. A meeting will be held at the project site and shall include the County Project Manager (County Project Manager) and the Contractor or Contractors. Other representatives from County departments may also be present.

b. This will be an organizational meeting, to review responsibilities of the Contractor and personnel assignments to finalize the locations of the temporary facility for containment. In addition, final coordination will occur as to which building services will be "active" or inactivate, based upon the decisions of the Owner or his maintenance staff.

1.05 PRE-REMEDATION CONDITION INSPECTION:

a. Before commencement of any work activities, the Contractor shall walk-through the area of Work.

The contractor shall develop a list indicating the condition of all items, materials, fixtures and finishes, which are to remain in the Work Area during remediation activities. Other areas may also be included outside the Work Area if it is anticipated that the Contractor's activities could adversely affect these areas. The contractor shall include photographs showing the condition of materials and surfaces and documenting and pre-existing damage. Failure to identify damaged property or conditions will not relieve the contractors' responsibility to restore property to its original condition or replace damaged material.

b. This survey should also cover any areas which are affected by remediation activities and need to be restored at the end of the job. This survey will serve as an important part of the project closeout phase, since it will determine if further repairs, replacements, or adjustments need to be made to the Work Area before final payment is approved for the Contractor. Submit a copy of this survey, signed by the contractor's representative performing the inspection, as part of the pre-job submittal package.

1.06 DAILY LOG:

a. The Contractor shall maintain at the Work site a DAILY LOG documenting the dates and times of, but not limited to, the following items:

1. Meetings: purpose, attendees, brief discussion.
2. Visitations: authorized and unauthorized.
3. Personnel, by name, entering and leaving the Work Area.
4. Special or unusual events, i.e. barrier breaching, equipment failures, accidents, disputes, injuries, etc.
5. Air monitoring tests and results (includes OSHA compliance monitoring).

b. Documentation of Contractor's completion of the following:

1. Inspections (by the County Project Manager) of the Work Area preparation prior to start of removal activities..
2. Removal of any sheet plastic barriers.
3. Contractor's request for (County Project Manager) inspections prior to lock-down, encapsulation, or any other operation that will conceal the condition of mold materials or the substrate from which such materials have been removed.
4. Removal of waste materials from the Work Area.
5. Contractor's request for (County Project Manager) final inspection and final air clearance test.
6. Verification of all additional work by the Contractor and County Project Manager.

c. Submit copies of this daily log for with the final closeout documents in the Specific Post- Job Submittal.

1. The log shall be signed by an authorized representative of the contractor. Final payment for the project will not be authorized until daily log is received by the County.

1.07 SPECIAL REPORTS:

a. General:

Except as otherwise indicated, submit special reports directly to the Owner's Representative within one day of the occurrence requiring special report.

b. Reporting Unusual Events:

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

c. Reporting Accidents:

Prepare and submit reports of any accidents, at the Work area and anywhere else Work is in progress. Record and document date and actions and comply with the requirements of Article 10 of the General Conditions of the Contract.

1.08 CONTINGENCY PLAN:

a. Contingency Plan:

Prepare a contingency plan for emergencies including fire, accident, power failure, Pressure Differential System failure, supplied air system failure, or any other event that may require modification or abridgement of the decontamination unit or the Work Area isolation procedures. Include in the plan specific procedures for decontamination or Work Area isolation. Nothing in this plan should impede safe exiling or provocation of adequate medical attention in the event of an emergency, regardless of other specification sections.

b. Telephone Numbers:

Post on the Personnel Decontamination Unit, telephone numbers and locations of emergency services including, but not limited to fire, ambulance, hospital, policies, and the power company.

1.09 NOTIFICATIONS:

- a. Notify the County in accordance with NESHAP requirements.
- b. Notify other entities at the job site of the nature of the mold abatement activities.

1.10 SUBMITTALS:N/A

1.11 PLAN OF ACTION:

a. At the request of The County the Contractor shall submit an itemized and detailed Plan of Action for the procedures proposed to comply with various removal methods (floor tile, ceiling tile, HVAC mastic, etc.) of this specification. Include in the plan the method and means of supplying water and power to areas of the job, the methods and timing to shut down or shut off the various building systems affecting the work, the sequencing of remediation work, the interface of trades involved in the performance of the work, methods to be used to ensure the safety of building occupants and visitors to the site, a disposal plan including location of approved disposal site and a detailed description of the methods to be used to control contamination.

Expand upon the use of portable, HEPA ventilation system, isolation of the building's electrical and mechanical system, method of removal to prohibit visible emissions in the Work Area and packaging of removed contaminated debris.

b. If any individual work assignment has specific conditions that require deviation from the standard Plan of Action, submit those special procedures in a Plan of Action included with the Pre-Job Submittals for that P.O..

1.12 INSPECTION- EXISTING CONDITIONS:

a. Prior to commencement of the work, an inspection will be made of pre-existing conditions. A list will be made by the Contractor of the condition of all related items and surfaces anticipated to be affected by the work. Photographs showing the condition of existing elements and finishes shall be included by the Contractor with the list. At the completion of work, the list will be used to evaluate the work.

1.13 STOP WORK:

a. If the Owner, the Owner's Representative or the Project Administrator presents a written Stop Work Order, the contractor shall immediately and automatically stop all work. Do not recommence work until authorized in writing by the entity that issued the Stop Work Order.

1.14 P.O. QUANTITIES & COSTS:

a. The P.O. will establish the scope of work and define the location of for each specific work order. If any other materials are found, not noted in the P.O., which are suspected of containing mold, the Contractor shall immediately notify the Owner's Representative in order to determine if the materials contain mold and if a change is to be made to the P.O.

b. Material quantities, sizes, and other factors affecting costs shall be verified by actual field inspection and measurement by the Contractor before starting work on any individual job. Any discrepancies with the P.O. amounts will be reported in writing to County prior to the acceptance and execution of the P.O., by proper completion of the P.O.'s Part II. If accepted, the P.O. will be revised accordingly. Otherwise, County and the Contractor shall review the work to resolve the

discrepancies; Contractor's failure to visit the work site and verify existing conditions and amounts (SF, LF, etc.) shall constitute his acceptance of the issued P.O. quantities and costs.

c. If Unforeseen Conditions are encountered during the course of the work, that will affect quantities or costs, the Contractor shall immediately bring same to the Owner's attention in writing. No work shall commence relative to the unforeseen conditions/materials until verification, quantification and written acceptance by County of any additional costs.

1.15 CONTRACTOR'S USE OF PREMISES:

a. General: During the entire construction period the Contractor shall have the use of the designated work area for construction operations. When applicable, an area will be designated for use outside the building for staging and storage (Container to be provided by the Contractor). Contractor's personnel shall restrict their movements to designated areas. Care will be taken to operate in an unobtrusive and manner in order to minimize the impact of the abatement operation on the functioning of the adjacent facilities.

b. Use of the Site:

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

2. Keep existing driveways and entrances serving the premise clear and available to the Owner and

his employees at all times. Do not use these areas for parking or storage of materials unless specifically instructed by the County Project Manager .

3. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated on the drawings or by County Designers and verified by County Project Manager .

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

c. Contractor's Use of the Existing Facility/Building:

1. The Contractor shall provide photo identification cards for his/her employees to be worn at all times while conducting work for the County. Identification cards shall include the name of the Remediation Contractor, employee's name. T-shirts with company logo or name will not be accepted as substitution for photo identification cards. Personnel without proper photo identification will be required to leave the facility.

2. The Contractor must insure that workers are properly attired at all times. (No muscle shirts, short shorts, cutoffs, or clothes with inappropriate markings). Proper decorum shall be maintained at all times while. Any workers whose attitude in any way, shape or form interferes with, threatens, or in any other manner disrupts the school operations will be removed immediately from the job site upon notice by a County Representative.

3. The Contractor's remediation project supervisor (superintendent) must be present, on-site, throughout the entire remediation operation while workers are utilized. The Contractor's must have a remediation project supervisor inside the work area(s) during the entire removal phase of each project. Environmental projects requiring (Environmental Certified Worker Courses) will require a certified worker outside each decontamination unit or decontamination station to prevent entrance by unauthorized persons. The County Project Manager may stop work if the supervisor is not present at any time noted above.

4. Maintain the existing building in a safe and weather tight condition throughout the construction period. Take all precautions necessary to protect the building and its occupants during the construction period.

5. Keep public areas such as hallways, stairs, elevator lobbies and other facilities free from accumulation of materials, equipment and debris. Any equipment which must be operated outside the work area must be properly protected, monitored, and secured to prevent unauthorized access.

6. The Contractors will not be provided with phone privileges on project site, except for emergencies.

7. Portable heaters shall not be permitted.

8. Smoking and tobacco product use by the Contractors Employees shall be strictly prohibited at all times on County Property. Alcohol, drugs, and mood modifiers shall be strictly prohibited at all times on County Properties. Employees observed to be under the influence of said substances shall be immediately removed from site. Employees observed to possess said substances, while on site, will be referred to the proper authorities.

9. When required, the Contractor shall provide single occupant, self-contained toilet unit(s) of the

chemical type for the employees use. Toilet shall be properly vented and fully enclosed with a glass-fiber reinforced polyester shell or similar non- absorbent material and regularly emptied. Portable toilets shall be placed where indicated by the County Project Manager and the site administrator, and properly secured against tipping and vandalism. Lock portable toilet facilities at night and when leaving the site.

1.16 OWNER OCCUPANCY:

a. The Owner normally will occupy the site and the existing building during the entire period of construction. Full cooperation with the Owner or his Representative is required during construction operations, to minimize conflicts and to facilitate Owner's usage. Perform all Work so as not to interfere with the Owner's operations.

1.17 OWNER'S OBLIGATIONS:

a. Removal of Existing Objects: Prior to the start of work, the Owner will remove computers, telephones copy machines and other movable electronic equipment. The Contractor will be responsible for moving all other movable furnishings, small objects, books, etc. and any other movable objects which are not moved by the Owner, if specified in the P.O.. The Contractor will be compensated for the removal/return of FF&E based on the established unit prices for General Hourly Work.

b. Storage of Removed Items: The owner will provide a secure storage area at each job site to store the Owner's furniture, equipment, and other items.

c. Approval of the Plan of Action: When requested The Owner's Representative, before the start of any abatement activities shall review the Plan of Action. This review shall place special attention on the need to access or shut off any electrical, mechanical, piping, controls or other building systems that may relate to this or other building operations during the abatement period.

Part 2 - PRODUCTS (Not Applicable)

Part 3 - EXECUTION

3.01 SEQUENCE OF WORK: MOLD

a. The following sequence is intended as a general list of the work items and may be adjusted after consulting with the Owner's Representative.

1. The Contractor will remove all equipment, furnishings, etc., as noted in other sections and wet wipe/clean as required by the P.O..
2. Coordinate the shut-down of all building services affected or modified as a result of the abatement activities.
3. Establish separation walls and security access areas as required by the plan of Action or on the plans. Establish and secure the work areas outside of containment.
4. Install critical barriers on all outside walls per Section 01526.
5. Provide for electrical and plumbing connections to the work area. Establish decontamination areas per Section 01563.
6. Coordinate and provide effective engineering controls on the existing H.V.AC. ducts, electrical,

- sprinkler and the fire alarm systems, adjust or modify as necessary. Install mechanical protection on the sprinkler heads and coordinate with the Owner if the system cannot be shut down.
7. Install Primary and Secondary barriers per Section 01513 on walls, ceilings, etc. designated to remain.
 8. Install the pressure differential machines in the Work Area, connect to discharge ducts vented to exterior as designated by the County Project Manager .
 9. Provide any "surgical" procedures at this time to install critical enclosure and/or fireproofing barriers at any space as required to establish proper negative pressures.
 10. Remove mold from all surfaces (flooring, pipe insulation, etc.) within the temporary enclosure.
 11. Erect any permanent enclosures as shown on the drawings.
 12. Dispose of mold removed from the enclosure area.
 13. Decontaminate the enclosure area.
 14. Encapsulate as applicable
 15. Remove primary and critical barriers and the pressure differential system.
 16. Perform final cleaning, etc. as required for project clearance.
 17. Receive approval for work area clearance.
 18. Provide all required final documentation, pay requests, etc. as required and other contract documents.

END OF SECTION

**SECTION 01092
CODES, REGULATIONS, AND STANDARDS**

PART 1 - GENERAL

1.01 SUMMARY:

- a. This Section sets forth governmental regulations and industry standards which are included and incorporated herein by reference and made a part of the specification. This Section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received or which must be given to governmental agencies before start of the Work.
- b. Requirements include adherence to Work practices and procedures set forth in applicable codes, regulations and standards.

1.02 CODES AND REGULATIONS:

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, 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 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 Codes, Work practices, hauling, disposal, protection of workers and visitors to the site including persons occupying areas adjacent to the site. Since the Contractor is responsible for coordinating other trades within this scope of work, the Contractor must comply with Chapter 489, Florida Statutes, concerning requirements for building contractors in addition to being licensed as a Florida Mold Remediator (per Chapter 468.84). 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, Owner's Representatives and the Consultant harmless for his failure to comply with any applicable

Work, Hauling, Disposal, Safety, Health or any other applicable regulations on the part of himself, his employees or his subcontractors. The contractor shall be responsible for any monetary fine incurred by the owner as a result of actions by any employee or representative. In the event of such fine the owner shall have recourse to any and all payments owed to the contractor for individual P.O.s issued under this contract, in order to defray the cost.

c. **Posting and Filing of Regulations:** Maintain two (2) copies of applicable federal, state and local regulations indicated above. Maintain one copy of each at the job site and keep one copy of each in the Contractor's main office. Applicable regulations include, but are not limited to, the following:

d. **Federal, State & Local Requirements:** Regulations and guidelines that govern asbestos and lead abatement Work, hauling and disposal of asbestos or lead waste materials, and mold remediation and duct cleaning guidelines, which are incorporated herein and become a part of these documents, include but are not limited to the following:

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

- 1. **Respiratory Protection**
Title 29, Part 1910, Section 134 of the Code of Federal Regulations

2. Access to Employee Exposure and Medical Records Title 29, Part -1910, Section 2 of the Code of Federal Regulations
3. Hazard Communication
Title 29, Part 1926, Section 59 of the Code of Federal Regulations
4. Specifications for Accident Prevention Signs and Tags Title 29, Part 1910, Section 145 of the Code of Federal Regulations

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

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

State Requirements: Governing abatement Work or hauling and disposal of mold remediation, including, but not limited to the following:

1. Chapter 468.84 of the Florida Statutes (Licensure of Mold Remediators).

National Air Duct Cleaners Association (NADCA) Guidelines: Guidelines which provide procedural safeguards and best practices in the accessing and cleaning of HVAC ductwork and components, including but not limited to:

1. General Specifications for the Cleaning of Commercial HVAC Systems-2005
2. Assessment, Cleaning and Restoration Standard (ACR)-2006

1.03 STANDARDS:

a. Standards which govern abatement Work or hauling and disposal of mold waste materials, as well as mold remediations, include but are not limited to the following:

1. American National Standards Institute (ANSI)
2. Fundamentals Governing the Design and Operation of Local Exhaust Systems, Publication 29.2-79.
3. Practices for Respiratory Protection Publication 288.2-80.

1.04 EPA GUIDANCE DOCUMENTS:

a. EPA Guidance Documents: Listed below for the Contractor's information only. These documents do not describe the Contract Work and are not a part of the Work of this Contract.

1. Guideline: Mold Remediation in Schools and Commercial Buildings; EPA 402-K-01-001.

1.05 LICENSES:

a. Licenses: Maintain current licenses as required by applicable State or legal jurisdictions for the removal, transporting, disposal or other regulated activity relative to the Work of this Contract.

1.06 TAXES AND FEES:

a. Unless otherwise provided in the Contract Documents, the Contractor shall pay sales, consumer,

use and other similar taxes which are legally enacted when bids are received or negotiations concluded whether or not yet effective or merely scheduled to go into effect. The contractor shall secure and pay for the building permit and all other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work. The County will reimburse contractor's direct cost for permits or other governmental fees with proof of payment.

1.07 PATENTS, ROYALTIES AND LICENSES:

a. The Contractor shall pay all patent licenses, royalties and license fees relating to, or involved with, the accomplishment of this work. As a condition of this contract the contractor agrees to hold the Owner and the Consultant harmless against any related claims and he shall defend the Owner and his Consultant from any legal action or monetary claims or related damages for any infringement of any patent rights, methods or license agreements.

1.08 SUBMITTALS: N/A

1.09 NON-COMPLIANCE:

a. CONTRACTOR VIOLATIONS:

1. If the contractor, during the course of the work, fails to comply with applicable codes, regulations, contract specifications, or safety requirements, The County Representative shall issue a verbal warning to the Contractor's on-site supervisor, requesting immediate correction followed by a subsequent Notice of Non-Compliance to the Contractor's on-site supervisor for the violation(s) observed. The site Notice of Non-Compliance will be reported to the County, which in turn may issue a copy of the County Representatives' Notice of Non-Compliance to the Contractor within 24 hours of the occurrence, advising the Contractor of the violations incurred by its field personnel. Upon receipt of a Non-Compliance, the Contractor shall immediately confirm to County in writing, the corrective action taken to remedy the situation.

2. If the Contractor fails to correct the violations cited, the County shall issue a Stop Work Order; work shall not resume until all required corrections have been implemented. If the observed violations are of such nature that a toxic substance release could result, or that the health and safety of persons or property are endangered, the County Representative will order the Contractor to stop work immediately. Any delays in the completion of the work, as a result of stoppage due to non-compliances, shall be borne by the Contractor, and shall not be reason for extension of the project schedule; the Liquidated Damages provisions of the contract shall apply.

3. Non-Compliance: If the violation is such that a Non-Compliance Notification is issued, the citation will be recorded in the contractor's file and will be considered as part of the Contractor's evaluation. Any violation which results in exposure of the occupants to contaminants will be notified to the EPA/Region IV office in Atlanta, the OSHA/South Florida office, and/or the County, as appropriate.

b. CONSEQUENCES OF NON-COMPLIANCE:

1. The Contractor's Non-Compliance record will be kept as part of the firm's performance history. The County shall use the evaluation results to determine acceptance for future bids.

2. Repeated failure by the Contractor to comply with the requirements of the Contract Documents and applicable regulations, evidenced through the issuance of multiple Non-Compliance notices, shall constitute sufficient cause for termination of the Contract and declaring the Contractor "non-responsible."

PART 2 – PRODUCTS (NOT APPLICABLE)
PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION

SECTION 01503 TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.

1.02 SCOPE

- a. This section covers all temporary connections to existing building utilities and all temporary facilities required or necessary to carry out the Work.

1.03 COORDINATION WITH OWNER:

- a. The Contractor shall walk-through the project site with the Owner's representative to verify the exact locations from which temporary utilities can be obtained. No utility connections or use of Owner facilities will be permitted without prior Owner approval.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT:

- a. Provide new or used materials and equipment that are undamaged and in good serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards. Inappropriate or extremely damaged and/or worn equipment may be rejected by the Owner's Representative.

2.02 SCAFFOLDING:

- a. Provide scaffolding, ladders and/or staging necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type, such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions. Scaffolding in excess of 20' high or two levels shall be designed by a qualified structural engineer. Guardrails and toe-County's shall be used in accordance with 29 CFR 1926.451.
- b. Scaffolding shall not be moved or relocated while occupied by any workers.
- c. Equipment rungs off all ladders (aluminum ladders will not permitted in the Work Area) with an abrasive non-slip surface. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.
- d. Scaffolding exceeding more than two (2) 6 X 8 sections high will be compensated utilizing the Term-Bid Additional Equipment Cost For Special Projects line item cost for the: day, week or by the month. Specialized, large, complex scaffolding, requiring structural engineering calculations and specialized erection and bracing, shall be rented/leased from a professional scaffolding company. Costs of said scaffolding will be reimbursed to the contractor upon submittal of valid, paid receipts from the scaffolding company.

2.03 TEMPORARY WATER SERVICE:

- a. Temporary Water Service Connection: Valves and connections shall be compatible and properly rated for operation with the temperatures and pressure encountered. After completion of use, all connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaks from dripping valves and connections will not be allowed; such valves or connections shall be replaced.
- b. Water Hoses: Use heavy-duty, abrasion-resistant hoses with a minimum pressure rating of 125 p.s.i. Provide appropriate and correct 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 filtration equipment.
- c. Hot Water: Provide UL-rated electric water heater to supply hot water for the Decontamination Unit shower. The water heater is required to be in operation while removal is in process. Provide heater with relief valve connecting to PVC or hard copper piping leading to a suitable drain or receptacle. Wiring of the water heater shall be in compliance with local electric codes for wet locations.

2.04 TEMPORARY ELECTRICAL SERVICE:

- a. General: Comply with applicable NEMA, NEC, and UL standards, and local governing codes and regulations, for materials and layout of all temporary electrical service.
- b. Contractor Qualifications: Electrical service shall be installed by an electrical contractor properly licensed by the State of Florida Department of Business and Professional Regulation, under Section 489, Florida Statutes, or hold a Lee County Certificate of Competency. Employees installing electrical services shall possess a personal Certificate of Competency as a Journeyman Wire-man issued by the Lee County Licensing County.
- c. Temporary Power: Provide temporary service to accommodate all electrical equipment required for the completion of the work. The source of the power shall be at a location designated and approved by the owner. Connection to emergency panels is not permitted. Provide calculations to the Owner's Representative showing all anticipated loads and capacity of power source to handle such loads. Source for temporary power should be at a distribution panel to prevent any disruption of power to the occupied classrooms. The temporary panel shall be located in the clean room of the decontamination unit or enclosed separately with hard barriers with locked access (pad lock shall be same key as decontamination unit. (Provide lockable boot/plug lockout, if required for connection of temporary electric service (pig tail connections).
- * If a pig tail connection is not used, the hard-wire SO (electrical cable) must be disconnected upon reaching substantial completion and removed no later than the same day of demobilization. Upon removing the temporary panel, the Electrical subcontractor must restore the electrical panel. Provide knock out plugs and patching of walls where required.
- * For Fuse Type Panels, provide a Disconnect Box with the appropriate size breaker to adequately accommodate and supply the Asbestos Contractors Temporary Electric Service Panel.
- * Contractor must maintain all temporary power equipment, cords, connections, building panels, temporary panels, outlets, outlet covers, breakers and their components in accordance with NEC and OSHA standards.
- d. 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 voltage necessary for work operation.

- e. Electrical Connection: Electrical contractor to furnish properly sized main breaker for connection of the electrical equipment and loads served at its supply point.
- f. Ground Fault Protection: Equip all circuits of Contractor's temporary panel with Ground Fault Circuit Interrupters [GFCI]. On Minor Work, where temporary panel is not required, provide individual GFCI protection to all circuits used for the Work Area or Decontamination Units. GFCI's shall be circuit breaker type, with test and reset buttons.
- g. Electrical Power Cords: Power cord supplying the contractor's electrical panel shall be extra hard usage type and suitable for the environment installed. Power cord connections shall have strain-relief connectors. and be properly supported. Use of tie wire is not permitted. Extension cords for general use in the work area shall be a minimum #14 gauge three conductor with ground, heavy duty outdoor type. Use waterproof connectors to connect separate sections of electrical cords, as per OSHA Standards.
- h. Lamps and Light Fixtures: Provide general service incandescent or fluorescent light fixtures of the wattage indicated or required for adequate illumination as required by the Work in this Section. Protect lamps with guard cages, or "lexan" or similar enclosures where fixtures are exposed to physical damage. Provide vapor tight fixtures at work area and decontamination units. Provide rain-tight fixtures where subject to weather and moisture. All light fixtures shall be UL or FM labeled.

2.05 TEMPORARY HEAT:

- a. Heating Units: If required by the Owner's Representative, 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 resistance units. Under no circumstances shall fuel-burning units or forced air or fan type units be used inside the Work Area.

2.06 FIRST AID:

- a. First Aid Supplies: Comply with OSHA regulations and construction industry standards.

2.07 FIRE EXTINGUISHERS:

- a. Fire Extinguishers: Provide fire extinguishers in accordance with NFPA Standard 10 "Portable Fire Extinguishers", latest edition and Underwriters' Laboratories standards. Extinguishers shall be dry-chemical type, ABC multi-purpose, with fog nozzle attached to the hose and shall have a minimum UL Rating of 2A-10BC.

PART 3 - EXECUTION

3.01 SCAFFOLDING:

- a. During the erection and/or moving of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged. Use plywood or 90 lb. mineral surfaced felt under all legs directly in contact with the polyethylene.
- b. Clean debris as necessary from walking surfaces to maintain safety.
- c. Clean all equipment prior to removal from the Work Area and wrap in two layers of 6 mil thick polyethylene sheeting and seal before removal from the Work Area.

- d. Periodically inspect scaffolding to ensure that connections and components remain structurally sound and safe for continued use.

3.02 INSTALLATION/GENERAL:

- a. Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where indicated by Owner's representative and School Administrator and where they will serve the entire project adequately and result in minimum interference with the performance of the Work and with normal school operations.
- b. Require that tradesmen accomplishing this Work be licensed as required by local authority for the Work performed. Relocate, modify and extend services and facilities as required during the course of the Work so as to accommodate the entire Work of the project.

3.03 WATER SERVICE:

- a. Hot water shall be supplied at a minimum temperature of 100°F. Supply hot and cold water to the Decontamination Unit in accordance with Section 01563.
- b. Maintain hose connections and valves in leak-proof condition. Where the finish below a water connection might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. No hoses shall be permitted inside the work area.

3.04 ELECTRICAL SERVICE:

- a. Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity and power characteristics to accommodate performance of Work during the entire construction period. Install temporary lighting adequate to provide sufficient illumination for safe Work and traffic conditions in each Work Area.
- b. Lockout: All existing power to or through the Work Area as described below. Unless specifically approved otherwise, existing power and lighting circuits to the Work Area are not to be used. Contractor shall coordinate with Owner or his maintenance personnel to establish locations and sources of all power leading into work area. Owner must approve lock-out procedures.
 - 1. Lockout power to Work Area by switching off all breakers serving power or lighting circuits in the Work Area. Tape breakers in the "off" position. Tape notation to front of panel listing which circuits are to remain off, the reason and the date. Note that circuits are not to be energized unless approved by the Contractor.
 - 2. Lockout power to circuits running through Work Area wherever possible by switching off all breakers serving these circuits. Follow the procedure noted above. If circuits cannot be shut down for any reason, the conduits and junction boxes associated with these circuits shall be identified. All junction boxes, outlets or similar terminations shall be made waterproof and properly sealed against use or entry.
- c. Temporary Electrical Panel: Provide a temporary electrical panel, sized and equipped to accommodate all electrical equipment and lighting required by the Work, including Owner's laboratory testing equipment. Connect temporary panel to existing building electrical system where indicated by Owner's Representative. Protect temporary service with circuit breakers or fused disconnects. Locate the temporary panel as approved by the Owner or the Owner's Representative. All branch circuits are to originate from the temporary panel unless approved otherwise.

- d. Power Distribution System: Provide circuits of adequate size and proper characteristics for each use. Run wiring overhead and rise vertically where wiring will be at least exposed to damage from the construction operations. Properly install and test G.F.I. units.
 - e. Temporary Wiring: In the Work Area shall be type THW, non-metallic, sheathed cable located overhead and exposed for surveillance. Temporary lighting shall have waterproof connections. Provide water-tight enclosures or boxes for wiring devices. No aluminum wiring shall be permitted per Contractor's temporary service or branch circuits.
 - f. Number of Branch Circuits: Provide a sufficient number of branch circuits as required by the Work and sized per the National Electric Code. At minimum provide the following:
 - 1. One Circuit for each HEPA filtered fan unit, sized as required.
 - 2. For power tools and task lighting:
 - a. One 20 amp. 120 volt circuit in the Work Area for each 2,500 square feet of Work Area.
 - b. One 20 amp. 120 volt circuit at each decontamination unit, located in the Equipment Room. Each circuit can have up to 4 outlets (four gang box maximum).
 - 3. For the Owner's exclusive use while conducting air sampling:
 - a. One 20 amp. 120 volt circuit each Work Area.
 - b. One 20 amp. 120 volt circuit at the clean side of each Decontamination Unit.
 - c. One 20 amp. 120 volt circuit at each exhaust location of the HEPA filtered fan units.
 - 4. For the Owner's exclusive use for conducting final air sampling as set forth in Section 01714 - "Work Area Clearance" as follows:
 - a. Five outlets (120 volt) inside the Work Area in locations designated by the Owner's Representative.
 - b. Two outlets (120 volt) outside the Work Area in locations designated by the Owner's Representative.
- 3.05 TEMPORARY LIGHTING:
- a. Lockout: All existing power to lighting circuits in the Work Area as previously described. Unless specifically indicated by the Owner's Representative, 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 the temporary electrical panel.
 - b. Number of Lighting Circuits: Provide sufficient lighting circuits as required by the Work. All lighting circuits are to originate at the temporary electrical panel.
 - c. Lighting Levels:
 - 1. Where the work requires interruption of existing building lighting, provide sufficient temporary lighting to maintain required footcandle levels and ensure the safety of building occupants.

2. Where Work is being performed provide sufficient temporary lighting to ensure proper workmanship (60 foot candle minimum light level).
3. During Owner's visual inspection provide sufficient temporary lighting to permit proper viewing of all surfaces in the work area (80 foot candle minimum light level).
4. In the Decontamination Unit provide lighting to maintain a 50 foot candle minimum light level.
5. Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel.

3.06 SANITARY FACILITIES:

- a. Restrooms Assigned to Contractor: Use of the Owner's existing restroom facilities may be allowed at the discretion of the Facility Administrator. If assigned, these facilities are to be properly cleaned and maintained in a condition acceptable to the Administrator and the Owner's Representative. At substantial completion, restore these facilities to the condition prevalent at the time of initial use.
- b. Restrooms/Shared Use: At the discretion of the Facility Administrator, the contractor may be allowed use of restroom facilities also being used by facility staff. Contractor shall ensure its employees use and maintain these facilities in a manner consistent with normal facility use. Contractor's employee shall ensure facilities are clean and orderly after their use, and they must conduct themselves with courtesy and decorum toward facility staff.
- c. Restroom/Portable: When use of existing facilities is not permitted, provide portable restroom facilities at location indicated by Owner's Representative. Portable facilities shall be maintained in a condition acceptable to the Owner.
- d. Restroom facilities, whether shared, assigned, or portable shall not be used for storage of Contractor's materials, tools, or equipment, under any circumstances.

3.07 FIRE EXTINGUISHERS:

- a. Fire Extinguishers: Locate fire extinguishers where required by regulations and where they are most convenient and effective for their intended purpose. Provide not less than one extinguisher in each Work Area, one in the Equipment Room and one outside the Work Area in the Clean Room.

END OF SECTION

**SECTION 01513
TEMPORARY PRESSURE DIFFERENTIAL & AIR CIRCULATION SYSTEM**

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Related Work Specified Elsewhere:
 - 1. Regulated Areas: Section 01526
 - 2. Decontamination Units/Tunnels: Section 01563
 - 3. Remediation of Mold-Contaminated Materials Section 13283
 - 4. Remediation of Other Environmental Contaminants Section 13284

1.02 QUALITY ASSURANCE – MONITORING (MANOMETER REQUIRED):

- a. The Contractor shall continuously monitor and record the pressure differential between the Work Area and the ambient air outside of the Work Area, with a monitoring device (manometer) incorporating a continuous recording device (e.g. strip-chart). The manometer must be set up and operated in the clean room. This device shall be supplied by the Contractor, and shall have both audio and visual alarm systems. (Per OSHA 1926.1101 Recommendations).

PART 2 – PRODUCTS

2.01 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: Shall be constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches to fit through standard-size doorways. Provide units whose cabinets are factory-sealed to prevent contaminants from being released during use, transport or maintenance, which are arranged to provide access to and replacement of all pre- filters from the intake end and are mounted on casters or wheels.
- 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 mm dioctylphthalate (DOP) particles. 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.

e. 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:

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

Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit.

f. Odor Filters: When determined necessary by the Owner, an organic vapor filter shall be placed in the pressure differential machine in order to control odors resulting from mastic removal.

g. Instrumentation: Provide HEPA filtered fan 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 replaced.
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 replaced.

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

1. Electrical (or mechanical) lockout to prevent the fan from operating without a HEPA filter, or with the HEPA filter in backwards.
2. Automatic shutdown system to stop the fan in the event of a rupture in the HEPA filter.
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.

i. 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.

PART 3 - EXECUTION

3.01 PRESSURE DIFFERENTIAL ISOLATION

- a. Physically isolate the Work Area from all adjacent areas or systems of the building with a Pressure Differential System that will cause a movement of air from outside to inside the Work Area at the location of any breach in the isolation of the Work Area.
- b. Relative Pressure in Work Area: For certain Mold Remediation Projects, and/or where specified in the P.O., continuously maintain the Work Area at an air pressure that is lower than that in any surrounding space in the building or at any location in the immediate proximity outside of the building envelope. This pressure differential when measured across any physical or critical barrier must equal or exceed a static pressure of -0.02 inches of water. Accomplish the pressure differential by exhausting a sufficient number of HEPA filtered fan units from the Work Area. The number of units required will depend on machine characteristics (CFM), the volume of the work area, the required number of air changes, and the efficiency of the seal at isolation barriers. 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 isolation by airtight enclosure of the work area from adjacent areas, reinforcing the seals where required. Establish required air circulation and air changes in the Work Area, personnel and equipment decontamination units. Exhaust a sufficient number of units from the work area to develop the required pressure differential.
2. The required number of HEPA filtered fan units is the number determined by the procedures outlined above and detailed in Paragraph 3.02 below. One additional fan unit shall be available on site as a back-up unit. The back-up unit must be located inside the work area prior to the start of removal.
- c. Exhaust the HEPA filtered fan units: To the outside of the building unless authorized otherwise in writing by the Owner's Representative. If authorized to vent inside the building, provide means for odor control. Outside vents shall exhaust a minimum of four feet above the lowest roof section unless authorized otherwise by the Owner's Representative.
 1. Mount units to exhaust directly or through disposable duct-work. Use duct-work and fittings of same diameter or larger than the discharge connection on fan unit. Arrange exhaust as required to inflate duct to a rigidity sufficient to prevent flapping. Contractor shall mount exhaust duct-work independently of existing roofing system (membrane, flashing, soffit, fascia, drip guard, etc.) All ducts shall be disposed upon project completion.
 - d. Isolate elevators, stair towers and return air intakes: For work in buildings greater than 5 stories in height or wherever there is a high speed elevator: 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 and follow the follow procedure:
 1. Fabricate seal by first sealing door with duct tape and 6 mil thick polyethylene. Construct a barrier from ½" gypsum supported by 3- 5/8", 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 thick sheet plastic and duct tape.
 2. Pressurize space with exhaust with 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.
 3. Locate HEPA filtered fan unit outside of the 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 air flow) while still maintaining required air pressure.
 - e. Isolation of chases and enclosed stairs in buildings greater than 5 Floors in height: Pressurize chases and enclosed stairs with HEPA filtered air so that it is at a pressure greater than any adjacent Work Area. 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 return air duct-work: Return air duct work which must be kept operating and is located in or thru the Work Area is to be isolated from the Work Area as follows:
 1. Cover the opening with a hard barrier, such as plywood, and seal with duct tape. Wrap the barrier with two layers of 6 mil thick polyethylene. Seal all polyethylene seams with spray cement and duct tape. Test to see if the system is capable of resisting air pressures and get Owner's Representative approval before proceeding further.

3.02 AIR CIRCULATION IN THE WORK AREA:

- a. Air Circulation: For purposes of this Section air circulation refers to either the introduction of outside air into the Work Area or the circulation and filtering of air within the Work Area. Air circulation in the Work Area is a minimum requirement intended to help maintain airborne fiber counts at a level that does not significantly challenge the Work Area isolation measures. The Contractor may also use this air circulation as part of the engineering controls in his worker protection program.
- b. Determining the Air Circulation Requirements: Provide a fully operational air circulation system supplying a minimum of the following air circulation rate: 4 air changes per hour.
- c. 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.
 2. Determine the total air circulation requirement in cubic feet per minute (CFM) for the Work Area by multiplying this volume by the number of air changes and dividing by 60. Air Circulation Required in Cubic Feet of Air per Minute (CFM) = Volume of work area (cu.ft.) X Number of air changes per hour 60 (minutes per hour)
 3. Divide the air circulation requirement (CFM) above by capacity of HEPA filtered fan unit(s) used. Capacity of a unit for purposes of this section is the capacity in cubic feet per minute with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics.
 Number of Units Needed = $\frac{\text{Air Circulation Requirement (CFM)}}{\text{Capacity of Unit with Loaded Filters (CFM)}}$

3.03 EXHAUST OR RE-CIRCULATION SYSTEM

Use either the Exhaust System or the Re-circulation System as described below:

- a. EXHAUST SYSTEM: Pressure differential isolation and air circulation in the Work Area may 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 the Work Area primarily through the decontamination unit and so that air circulates between all areas of the work area.
 3. Place End of Unit, and intake duct or its exhaust duct through an opening in the plastic barrier or wall covering. Seal the plastic around the unit or duct with tape.
 4. Exhaust HEPA filtered fan units to the outside of the building unless otherwise authorized, in writing by the Owner's Representative. If authorized to exhaust inside the building, provide means for odor control.
 5. Decontamination Unit: Arrange the Work Area and the Decontamination Unit so that the majority of makeup air comes through the Decontamination Unit.
 6. Supplemental Makeup Air Inlets: Provide supplemental air openings if required for proper air flow through the Work Area in a location only as approved by the Owner's Representative. Locate 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 areas.
 7. Make-up air inlets must be covered with a pre-filter and then covered with flaps to reseal automatically if the Pressure Differential System should shut down for any reason.
 8. Prepare overlapping surfaces of plastic with double- sided carpet tape to ensure seal if system shuts down. The

Owner's Representative shall inspect the installation for compliance.

- d. RE-CIRCULATION SYSTEM: If authorized by the Owner's Representative, the pressure differential isolation and air circulation in the Work Area may be accomplished by a re-circulation system as described below:
 - 1. Re-circulate air: In the Work Area through HEPA filtered fan units to accomplish air circulation throughout the entire work area.
 - 2. Location of Fan Units: Locate the HEPA filtered fan units so that air is circulated between all parts of the Work Area and so that required pressure is maintained throughout all parts of the Work Area. Move units as necessary so that in any location where asbestos-containing materials are being disturbed the exhaust from one HEPA filtered fan unit is blowing contamination away from the workers. Direct air flow in these locations so that it is predominantly toward workers' back at the breathing zone elevation.

3.04 AIR CIRCULATION IN DECONTAMINATION UNITS:

- a. Pressure Differential Isolation: Continuously maintain the pressure differential required for the Work Area in the Decontamination Unit across the shower room with the equipment room at a lower pressure than the clean room.
- b. Air Circulation: Continuously maintain air circulation in the Decontamination Units at same level as required for the Work Area.
- c. Air Movement: Arrange air circulation through the Decontamination Unit so that it produces a movement of air from the clean room through the shower room into the equipment room.

3.05 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM:

- a. General: Each HEPA filtered fan unit shall be serviced by a dedicated minimum 115V- 20V 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 the fan units.
- b. Testing the System: Test the pressure differential system before any asbestos- containing material is wetted or removed. After the Work Area has been prepared, the decontamination facility set up and the fan unit(s) installed then start the unit(s) (one at a time).
- c. Demonstrate the operation and testing of the Pressure Differential System to the Owner's Representative.
- d. Demonstrate the condition of equipment: For each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of all lights, proper operation of all alarms, and proper operation and calibration on pressure monitoring equipment
- e. Demonstration of satisfactory operation: Of the Pressure Differential System to the Owner's Representative will include, but not be limited to, the following indicators:
 - 1. Plastic barriers and sheeting move slightly in towards the Work Area, the curtain of the decontamination unit move slightly in towards the Work Area, there is a noticeable movement of air through the Decontamination Unit, the use of smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room., Owner's Representatives' request the contractor will 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.

- f. Maintenance Records: Provide onsite, maintenance records for each HEPA filtered fan unit including but not limited to HEPA filter replacement, replacement of gaskets and seals and visual inspections.
- g. Modify the Pressure Differential System: As necessary to demonstrate successfully the above.
- h. Use of the System During Remediation Operations: Start HEPA filtered fan units before beginning Work (before any asbestos-containing material is disturbed). After remediation Work has begun, run the units continuously to maintain a constant pressure differential until complete decontamination of the Work Area and Final Air Clearance has been obtained and the Owner's Representative has given authorization to remove containment enclosure Do not turn off units at the end of the Work shift or when remediation operations temporarily stop. Do not shut down the Air Pressure Differential System during the encapsulation process. Supply sufficient pre- filters to allow replacement as necessary.

Begin remediation work at a location furthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all remediation Work and notify Owner's Representative. Do not resume until power is restored and fan units are operating again. No air shall be exhausted from the Work Area without HEPA filtration.

If replacement of the HEPA filter is required, this shall be accomplished inside the containment enclosure with adequate differential pressure. Equipment failure shall not be a valid reason for not maintaining a differential ambient air pressure. Any question regarding effectiveness of the air handling units or their capabilities will be decided by the Owner's Representative. No Removal Activities Will Be Allowed Without Proper Differential Air Pressure. At the completion of remediation Work, allow the fan units to run as specified under Section 01711 "Project Decontamination", to remove airborne fibers that may have been generated during remediation 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 remediation Work.

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

END OF SECTION

SECTION 01526 REGULATED AREAS

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Related Work Specified Elsewhere:
 - 1. Pressure Differential/Air Circulation System Section 01513
 - 2. Decontamination Facilities: Section 01563
 - 4. Remediation of Mold Contaminated Materials Section 13283
 - 5. Remediation of Other Contaminants Section 13284

1.02 SUMMARY

- a. Definition: Other definitions common in the industry notwithstanding, a Regulated Area is defined herein as an environmental work area with access restricted to trained, certified personnel, demarcated and isolated from other portions of the building, and which may require usage of personal protection equipment upon entry.
- b. This section outlines the processes and procedures for the demarcation, isolation, and access control of Regulated Areas for various environmental remediation projects.
- c. The requirements for the regulated work areas of different remediation projects will vary according to the toxicity and exposure risk of the different contaminants being remediated. Refer to detailed descriptions in this section, as well as in the "Removal" section for each type of contaminant.

PART 2 - PRODUCTS

2.01 POLYETHYLENE SHEET: Provide the following:

- a. Polyethylene Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil thick as indicated, clear, frosted or black, as indicated for decontamination units, walls, ceilings and temporary enclosures.
- b. Fire-Resistant Polyethylene Sheet: Where there is hot equipment or a potential for fire, provide flame-resistant polyethylene film that conforms to the requirements set forth by the National Fire Protection Association Standard 701, Small-Scale Fire Test for Flame-resistant Textiles and Films. Provide the largest size possible to minimize seams, 6.0 mil thick as indicated, clear, frosted or black, as indicated.
- c. Reinforced Polyethylene sheet: Where the plastic sheet is the only separation between the Work Area and the unabated portions of the building, provide nylon reinforced polyethylene film in the largest size possible to minimize seams, 6.0 mil thick minimum, clear, frosted or black, as indicated.

2.02 DUCT TAPE:

- a. Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to stick to sheet

polyethylene.

2.03 SIGNS AND WARNING TAPE:

- a. Provide warning signs and/or warning tape to designate the work area as off-limits to the general public. Such signs/tapes shall be in compliance with the requirements of OSHA 1926.1101. As part of the General Term Contract Submittals, submit samples of the signs and tape to be used.
- b. Signs shall be of materials that will withstand moisture and the elements, as well as wear and tear. Plastics, plastic or polyethylene film, or other similar materials, factory printed in color, shall be acceptable. No photocopies of signs shall be accepted.

2.04 PRESSURE DIFFERENTIAL SYSTEM

- a. Provide Negative Air Machines (HEPA filtered fan units), as specified in Section 01513, to establish air circulation within the work area, to filter the air through HEPA filters in order to minimize concentrations of airborne contaminants, and to establish a negative pressure differential between the work area and the ambient air outside of the work area.
- b. Negative pressure equipment must be in good condition. Provide evidence of capacity rating based on manufacturer's literature. Provide evidence of maintenance schedule. Owner's representative reserves the right to prohibit use of equipment exhibiting signs of damage, specially where filter seal may be compromised.

2.05 WOOD/PLYWOOD

- a. All materials for wood and polyethylene barriers shall be in good condition, without dangerous splinters, protruding nails, or other safety hazards.
- b. Wood studs and plywood shall meet the requirements of Section 01563 Decontamination Units/Tunnels, of these Specifications. Studs shall be pressure treated and no less than 2 x 4 in dimension. Plywood shall be at least 5/8" thick, exterior grade.

PART 3 - EXECUTION

3.01 SEQUENCE OF WORK:

- a. Carry out the Work of this section sequentially. Complete each activity before proceeding to the next.
- b. Further details regarding the sequence of the work are contained in Division 13.

3.02 GENERAL:

- a. Work Area: The Work Area is defined as the location where remediation work occurs. The extent, configuration, and enclosure requirements of the Work Area may vary depending on the type of contaminants and nature of the Work of the individual project. The Work Area 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. Decontamination of the Work Area must be effected at the completion of the remediation work, prior to re-occupancy of the space(s).

3.03 DEMARCATION OF THE REGULATED AREA:

- a. Clearly demarcate the limits of the regulated area to alert building occupants and the general public of the special restrictions regarding access and of specific protection requirements to be followed by those authorized to enter. Only Authorized Personnel will be allowed within the demarcated Work Area.
- 1. Where the area must be isolated, in accordance with the requirements specified herein below, warning signs shall be provided adjacent to entry points into the work area, in such a way that the signs are clearly visible to persons before they enter the regulated areas. All entrances to the work areas shall require signage appropriate to the type of remediation being performed.
- 2. Where the nature of the work is such that the work area does not need isolation by physical barriers, demarcate the area by barrier tape, maintaining a buffer distance in compliance with applicable regulations. The tape shall be printed with warnings or cautions consistent with the contaminants being remediated.
- b. For Remediation of Mold and other environmental contaminants, provide signs that read:

**DANGER MICROBIAL HAZARD
AUTHORIZED PERSONNEL ONLY**

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

- c. For cleanup of mold, and other environmental contaminant projects that do not require full enclosure of the work area, delineate the work area with 3-inch wide yellow polyethylene warning tape with a pre-printed warning reading "CAUTION" and/or "KEEP OUT". Install this ribbon between 3 and 4 feet above the floor and hang the above-referenced warning signs at periodic intervals around the perimeter (10 ft. o.c./min. to 20 ft. o.c./max.).

3.04 ISOLATION OF THE REGULATED AREA

- a. Completely Isolate the Work Area from other parts of the building so as to prevent asbestos, mold, or other contaminants, as well as water, dust or debris, from passing beyond the isolated area. Should the area beyond the Work Area {s} become contaminated with mold or other contaminants as 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 the Owner.
- b. Coordinate with the Owner's Representative (County Project Manager (County Project Manager) regarding the doors that will be locked and sealed as part of the isolation of the Work Area. After receiving authorization from the Owner's Representative lock all doors into Work Area. Cover any exit signs that direct emergency exiting, either outside or inside of the Work Area, to those locked doors. Seal the doors with 6-mil. polyethylene critical seals prior to covering with the regular Work Area barriers. Place an absorbent barrier, such as a rolled towel in the gap between the bottom of the door and the floor, to prevent escape of any liquids that may bypass the poly barriers should the seals fail. Post warning signs as described above, appropriate for the specific type of remediation being conducted. Unless otherwise noted or directed by the Owner's Representative, work area isolation shall not block emergency exits from occupied portions of the building.
- c. Place all tools, negative air equipment, scaffolding, staging, etc. necessary for the Work, in the area to be isolated, prior to completion of Work Area isolation.
- d. Remove all removable furniture that has been designated uncontaminated by the Contract Documents or the County Project Manager (if specified in P.O.). Also, remove uncontaminated equipment and/or supplies from the Work Area before commencing Work or completely cover with two (2) layers of polyethylene sheeting, at least 6 mil in thickness, securely taped in place with duct tape: Such furniture and equipment shall not be included in the scope of Work unless covering plastic or seal is breached.

- e. Disable Ventilating Systems or any other system bringing air into or out of the Work Area. Disable the system by disconnecting wires, removing circuit breakers, by lock- able switch or other positive means that will prevent accidental premature restarting of equipment. If the system cannot be disabled, seal off in an air-tight manner all ducting (supply and return), terminating or opening at the Work Area or physically divert or cut off all air flow to the Work Area.
- f. Lockout power to the Work Area or running through the work area, as specified in Section 01503, Subsection 3.04, and as coordinated with the Owner. Securely waterproof any electrical outlets, junction boxes, etc. which will remain "hot".
- g. Other Building Systems: Shall be modified as required by the Owner in conjunction with local authorities. Fire sprinkler heads shall be mechanically protected from damage and shall remain operational unless approval is received in writing to shut down the system. Fire, smoke and burglar alarm systems operation shall be coordinated with the Owner to alleviate any operational problems. No systems are to be shut down or made inoperative until written permission is received from the Owner or appropriate party.
- h. Inspection Windows: When specified in the P.O., install inspection windows, as directed by the P.O.. Each inspection window is to have a minimum 24" x 24" viewing area fabricated from 1/4" acrylic or poly-carbonate sheet. Install it in a manner that provides unobstructed vision from the outside to the inside of the Work Area. Protect the window from damage of scratching, dirt or any coatings used during the Work. A sufficient number of windows are to be installed to provide observation for as much of the Work Area as possible. Inspection windows that open into uncontrolled areas are to be covered with a removable plywood hatch secured by lock and key. Keys will be provided to the ERP! for all such locks.
- i. Temporary Barrier Walls: Where the work area is not completely contained within existing building partitions, and as required for safety, control or confidentiality, or as directed by the ERP! and the P.O., provide "physical barrier" walls to secure the work area from the balance of the building (public areas). Temporary barrier walls will be sealed with one or two layers of 6-mil. polyethylene sheeting, as required for Containment Barriers. The public side of containment barriers shall be clean, with a finished look acceptable to the Owner, and shall be free of any splinters, or other sharp edges or points, that could injure passersby.

3.05 ACCESS CONTROL:

- a. Locked Access: Arrange the Work Area so that the only access into the Work Area is through the lockable Decontamination Unit. Provide or install a hinged, lockable door or panel at the opening into the Decontamination Unit. Provide keyed - alike locks at all project sites, under this Term Contract. Provide a minimum of Ten keys for the Decontamination Unit doors to the Owner as part of the General Term Bid Submittals. Combination locks will not be accepted.

All other doors into the work area shall be secured and sealed per 3.04 above.

- b. Visual Barrier: Where the Work Area is immediately adjacent to, or within view of, occupied areas, provide a physical barrier so that the Work procedures are not visible to building occupants.
- c. Warning Signs: Provide appropriate warning signs per 3.03 above, at each access point to the Work Area, whether active or locked/sealed. (All warning signs shall be provided in the appropriate language(s) to ensure comprehension by those affected by this project). Warnings signs must be kept legible throughout the duration of the removal project. The contractor shall affix and maintain the approximate warning signs on all external sides of temporary enclosures.

3.06 EMERGENCY EXITS: Provide emergency exits and emergency lighting as set forth below:

- a. Emergency Exits: At specific locations provide the following means for emergency exiting: Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1" wide. Hang a retractable blade razor knife on a string beside the outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint the words "EMERGENCY EXIT" inside the outline with luminescent paint in letters at least one foot high and 2" thick.
- b. Emergency Lighting: Locate and install battery-pack type emergency lighting as required, if unavailable from building.

3.07 TUNNELS AND BARRIER WALLS:

- a. Tunnels: Where the scope of the Work involves the construction of tunnels, it shall be as described in Section 01563 of these Specifications.
- b. Barrier Walls: Where required by the P.O., by job conditions outlined in 3.04.i. above, or directed by the P.O., construct temporary barrier walls to secure the work area. The walls shall be free-standing and stable, secured to building floor slab and walls. The walls must provide a visual and physical barrier, of good appearance, to the satisfaction of the Owner. Barrier wall construction shall meet the requirements of Section 01563 of these Specifications or the requirements for wall County construction, as specified in U.S. Gypsum Company publications# SA-923 and # SA-924. Exterior applications shall use only 5/8" exterior grade plywood on pressure-treated wood studs. Details shall be as follows:
 - 1. Vertical studs and horizontal plates shall be pressure treated 2 x 4 wood, securely anchored.
 - 2. Wall panels shall be 5/8" minimum thickness, construction grade plywood, with one good side to face the occupied portions of the building.
 - 3. Alternatively, 25 ga., 3 5/8" galvanized metal studs and plates may be used, supporting 1/2" gypsum wall County panels, with seams taped and finished with joint compound.
 - 4. Regardless of the wall construction, the side facing the work area shall be sealed with critical barriers and wall poly as required for the enclosure or permanent building walls.

3.08 CONTAINMENT BARRIERS:

- a. Completely Separate the Work Area from other portions of the building and from the exterior environment using containment barriers, formed of polyethylene sheets, at least 6 mil thick, sealed with duct tape. Based on the nature of the contaminant, containment barriers shall be either one layer (primary) or two individual layers (primary & secondary) of polyethylene sheets. Where not directly applied to building walls, provide wood stud supports for the sheets, at 4'-0" center to center maximum spacing (closer as required). Studs shall be anchored to the building slab through a continuous wood plate and braced laterally as required. Where the barrier separates the work area from the exterior, or as needed for the individual condition, provide plywood panels attached to the studs and sealed from the work area side with the containment barriers (see 3.07 above).
- b. Critical Seals: Individually seal all ventilation openings (supply and exhaust), doorways, windows, and other openings into the work area with at least one layer of 6 mil thick polyethylene sheeting, taped securely in place with duct tape. These critical seals shall be prior to, and in addition to, the critical barriers. Maintain the seal until all Work, including Project Decontamination, is completed. Individual job requirements, as established in the P.O. or indicated by the County Project Manager, may also include the sealing of light fixtures, clocks, and other equipment or appurtenances. Take care when sealing lighting fixtures to prevent melting or burning of sheeting.

- c. Continuously seal the perimeter of all polyethylene containment and critical barriers with duct tape and/or spray cement.
- d. Mechanically support containment barriers independently of duct tape and spray cement seals, so that the seals do not support the weight of the plastic sheet. The following are acceptable methods of supporting the barriers. Alternative support methods may be used, if approved by the County Project Manager .
 - 1. For one layer installations: Install one 3/16" Tapcon or #12 screw into wall at each corner of wall to be covered, 4" below the ceiling. Wrap 2 strands of tie wire around the tapcons and stretch taut. If additional supports are needed for the wire, install tapcons/screws @ +/- 15'-0" o.c. along the wall. Drape 6 mil. polyethylene sheet over wire so that a two foot flap extends down. Staple or glue flap to poly sheet to encase the wire (staples @ 6" oc. max.). Erect the entire assembly so that it hangs vertically without floor "supports" upon which debris could collect. Seal all edges of the poly barrier as indicated inc. above. **DO NOT ATTACH MECHANICAL SUPPORTS (tie-wire) TO CEILING TILE, GRID, FIXTURES OR ELECTRICAL ITEMS.**
 - 2. For two-layer installations: Install a 1x3 wood plate horizontally on the wall at 4" from the ceiling. Attach the plate to the wall with tapcons, screws, or other fasteners appropriate for the wall construction, spaced at 2'-0" o.c. maximum. Staple each layer of polyethylene sheeting to the plate, through a cardboard strip; space staples at 6" o.c. maximum. Allow the sheet to extend above the plate and seal the sheet to the wall with spray glue and/or duct tape, for a continuous seal. Polyethylene sheet layers must be able to be removed as separate layers at the end of the job.
 - 3. Ceiling barrier: Provide 6-mil. polyethylene barrier. Install 1/4" Tapcons or other approved fasteners into walls across the room, 4" below the ceiling. Provide wire suspension system by wrapping 2 strands of tie wire around the tapcons and stretching same taut. Provide intermediate supports for the wire as required, by securing hanging wires through the ceiling grid to the support hangers or to the structure above. Suspension wire system shall be spaced a maximum of 8'-0" o.c.. Ceiling poly shall be draped over the suspension wires and secured with duct tape. Alternately, in lieu of wire supports above the ceiling, install "T" supports below the poly barrier at the locations where the wires would have been located. T-supports shall be constructed from 2x4 wood studs, of sufficient length to fit securely from floor to ceiling grid.
 - 4. Floor Covering: Where the floor is not part of the abatement/remediation, provide two layers of 6-mil. polyethylene sheeting over the floor. Create sharp right angle bends at junctions of the floor and walls, so there is no radius which could be stepped on, causing the wall attachment to be pulled loose or cutting the poly. Spray-cement and duct tape all seams in the floor covering. Locate seams in top layer six feet (6') from, or at right angles to, seams in the bottom layer. Install the sheeting so that the top layer can be removed independently of the bottom layer. Based on toxicity and condition of contaminant being remediated/cleaned, single 6-mil. layer (drop cloth) may be used, at the discretion of the County Project Manager .
 - 5. Any carpet flooring not contaminated and scheduled to remain shall be covered with (3) layers of polyethylene sheeting at least 6 mil thick. Place corrugated cardboard or other absorbent sheets between the top and middle layers of polyethylene. To avoid any movement, securely tape the cardboard to the underlying polyethylene sheeting.
- e. Layers: Containment barriers shall be provided in layers, as follows:
 - 1. Asbestos Floor Tile Removal: Provide one layer of 6 mil poly for all walls and barriers, and one layer of 6 mil. for all ceilings.
 - 2. Friable Asbestos Removal Projects: Provide two layers of 6 mil poly on all walls, ceilings, barriers, floors, and other necessary surfaces, as required, to enclose the Work Area. **FRIABLE CONDITION OF MATERIAL TO BE DETERMINED BY THE COUNTY.**

3. Mold Remediation Projects (involving removal of moldy building materials): At ceilings, walls, barriers and floors, provide one layer of 6 mil. poly.
4. For asbestos cleanups, as well as for mold and other environmental cleanups, no enclosure will generally be required, since all surfaces require cleaning. Based on job conditions, drop cloths at floor may be required, as directed by the P.O..
- f. Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are to be covered with plastic, provide 5/8" exterior grade plywood or similar material, over the plastic and securely hold in place. Do not cover rungs or railings with any type of protective materials, but clean thoroughly at the end of the job.
- g. Repair of Damaged Polyethylene Sheeting: Provide additional layer of 6 mil polyethylene sheeting over containment barriers which have been damaged by removal operations, or where seal has allowed water to seep between layers. If a second layer remains sealed from the exterior of the work area, remove the affected sheeting and wipe down entire area. Install new sheet plastic only when area is completely dry. If work area seal has been breached (mold & other environmental projects), add the new layer over existing and reseal the work area immediately. If accessible, approach the breach from outside the work area and decontaminate the area. If a breach occurs in an asbestos project, annex the contaminated area to the work area as per I. below.
- h. Ceiling Protection: Where required to protect the existing ceiling surfaces, the contractor shall use 6 mil polyethylene sheeting. Such sheeting shall not be hung from acoustical ceiling grid.
- d. Extension of Work Area: If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers out of the Work Area, then the affected area should be added to the Work Area, and enclosed as required by this Section of the specifications, and decontaminated as described in Section 01711- "Project Decontamination".

3.09 DROP CLOTH:

- a. Shall be used, to protect the floor layer(s) from debris generated by the remediation Work, as specified in the appropriate Work Sections. (Not required for floor tile work). On cleanup projects, provide drop cloths under walls to be cleaned, from the bottom of the wall to 6'-0" out, to contain any debris.

END OF SECTION

SECTION 01561 WORKER PROTECTION

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Related Work Specified Elsewhere:
 1. Respiratory Protection: Section 01562
 2. Decontamination Units/Tunnels: Section 01563

1.02 DESCRIPTION OF WORK:

- a. This Section describes the equipment and procedures required to protect workers against exposure to, mold, or other environmental contaminants, as well as other workplace hazards. For equipment and procedures for respiratory protection, refer to Section 01562 of these Specifications.

1.03 WORKER TRAINING:

- a. Mold: Although there are no federal regulations governing mold remediation, the Environmental Protection Agency has issued guidelines regarding the work. The industry standards, based on such guidelines and on certification requirements from the American Council for Accredited Certification, provide that an individual must complete a course in microbial remediation and receive an ACAC certificate. Florida Statutes 468.8413 establishes the minimum requirements to obtain license as a mold remediator, including 14 hours of continuing education every two-year period prior to license renewal. Firms and workers must meet all state requirements under 468.84.
- b. HVAC Duct Cleaning: The National Air Duct Cleaning Association (NADCA) specifications prescribe education and licensing requirements for firms and workers performing such work. Such requirements are hereby adopted into these specifications.
- c. Other Environmental Contaminants: Workers and firms performing remediation/cleanups of other environmental contaminants must have a minimum of two years' experience on similar projects and must meet all licensing requirements for the particular activity.

PART 2 - EQUIPMENT

2.01 PROTECTIVE CLOTHING:

- a. Coveralls: Provide disposable full-body coveralls and require that they be worn at all times by all workers in the Work Area. Provide a sufficient number and sizes of coveralls for all required changes of all workers and for inspectors, air monitoring personnel, etc. to be in the Work Area each day.
- b. Boots: Provide work boots with non-skid soles where required by OSHA for all workers. Provide boots at no cost to workers. For asbestos projects, dispose of boots as asbestos-contaminated waste at the end of the work task or seal in 6 mil thick plastic bags for transportation to the next job site.
- c. Hard Hats: On projects conducted on active construction sites, provide hard hats as required by OSHA for all workers and provide spares for use by authorized visitors. Require hard hats to be worn at all times that Work

is in progress which may potentially cause head injury. Require hats to remain in the Work Area throughout the Work. Thoroughly clean, decontaminate and bag hats before removing them from the Work Area.

- d. Goggles: Provide eye goggles as required by OSHA for all workers during mold remediation or cleanup projects, as well as those involved in scraping, spraying, applying amended water or encapsulant, or any other activity which may potentially cause eye injury. Full-face piece respirators may satisfy this requirement.
- e. Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area. Dispose of used gloves as contaminated waste at the end of the Work.

2.02 RESPIRATORY EQUIPMENT:

- a. Provide each worker with appropriate respirator as outlined in Section 01562/RESPIRATORY PROTECTION.

PART 3 - EXECUTION

3.01 GENERAL:

- a. Provide worker protection as required by the latest OSHA and EPA standards and guidelines for the specific contaminant involved in the work, unless more stringent requirements are written into these specifications. The procedures outlined herein are minimums that must be adhered to regardless of contaminant concentration in the Work Area.

3.02 DECONTAMINATION PROCEDURES:

- a. Require all workers and authorized visitors to adhere to the following personal decontamination procedures whenever they leave the Work Area:
- b. Dry Decontamination: For projects not requiring a shower, but having a dry decontamination station, the following procedures will be followed.
 1. Personnel entering the work area must don two sets of disposable coveralls (with head & foot covers) over their street clothes before entering the Work Area. Personnel must also wear the appropriate respirator as described in Section O1562/Respiratory Protection. Respirator must be worn at all times in or outside the Work Area while handling Asbestos Containing Materials, mold or other contaminants. For friable asbestos projects, workers must don two sets of coveralls. For other projects involving non-friable asbestos, or other contaminants, two sets of coveralls will also be required. Integrity of suits must be maintained throughout the abatement of all asbestos projects.
 2. For Mold cleaning or Remediation projects worker must don one (1) set of coveralls, Eye and Hand protection. Integrity of coveralls/protective suits must be maintained throughout the cleaning or remediation process.
 3. After leaving the Work Area, and within the Equipment Room, personnel should carefully HEPA vacuum all debris from the exterior set of protective coveralls. After vacuuming debris from the outer suit, workers shall mist the suit using an airless sprayer. They should then carefully remove the exterior suit, being careful to roll the clothing inside out so that the clean interior of the clothing is exposed. Removed coveralls must be disposed of as asbestos containing waste, in the waste bag located in the Equipment Room. Then, remove the interior suit, by similar roll-out process and properly dispose of suit while leaving on the respiratory protection.
 4. Proceed to the central Airlock to continue decontamination. Personnel should then, while still wearing the respirator, wet wipe the exterior of the respirator, using clean water from the container located in the Airlock. The respirator must not be removed until wipe down is completed and personnel has exited to the Clean Room.

5. Applicability: Dry decontamination techniques may be used for Class II asbestos abatement work and for minor (<10 sf/25 lf) Class I (TSI or surfacing ACM/PACM) abatement work, as well as for mold remediation/cleanup and other environmental projects, as specified herein or outlined in the P.O..

3.03 PROCEDURE WITHIN WORK AREA:

- a. Workers shall NOT eat, drink, smoke, chew gum or tobacco in the Work Area, regardless of the contaminant involved. To perform any of these tasks, workers shall exit the work area, after proper decontamination, as noted in the procedure described above and exit the decontamination facilities.

3.04 DECONTAMINATION PROCEDURES/MINOR WORK:

- a. The following procedures will be followed for minor work on projects using a Mini Decontamination Unit or a Floor Poly Decon Area. Perform the following at completion of the Work or at end of the work shift:
 1. Each person HEPA vacuums thoroughly the other person.
 2. While still wearing respirator each person removes their coveralls, turning it inside out while removing it.
 3. Place suits in a disposal bag located in the decontamination area.
 4. Each person HEPA vacuums hands, hair, face and respirator and wipes said items with damp towels.
 5. Each person HEPA vacuums area of respirator seal to face on the other person.
 6. 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 vacuum and wipe the blower unit and hoses. Carefully wipe the battery pack.
 7. Remove respirator and HEPA vacuum face at respirator seal, as well as all surfaces of the respirator. HEPA vacuum any parts of head or hair previously covered by respirator straps.
 8. Wash respirator face-piece inside and outside.
- a. Upon completion of above procedures, thoroughly wash face and hands with soap and water.

END OF SECTION

SECTION 01562 RESPIRATORY PROTECTION

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Related Work Specified Elsewhere:
 1. Air Monitoring Section 01410
 2. Regulated Areas Section 01526
 3. Worker Protection Section 01561

1.02 SUMMARY:

- a. This section outlines the procedures the Contractor must follow in order to comply with regulatory requirements relative to Respiratory Protection for workers. These procedures are intended to prevent worker exposure to airborne contaminants (asbestos, mold, and other environmental toxins) during the execution of the work.

1.03 STANDARDS:

- a. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.
 1. OSHA - U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910.134, and, 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. ANSI - American National Standard Institute - Practices for Respiratory Protection, ANSI Z88.2.
 4. NIOSH - National Institute for Occupational Safety and Health.
 5. MSHA - Mine Safety and Health Administration.
 6. EPA - Guidelines for Mold Remediation in Schools and Commercial Buildings, EPA 402-K-01-001.

1.04 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS:

- a. Provide air used for breathing in Type C supplied air respiratory systems that meets or exceeds standard set for CGA type 1 (Gaseous Air) Grade D.

1.05 MAXIMUM ALLOWABLE CONTAMINANT LEVELS (TYPE-C SYSTEMS):

- a. The following table sets forth the quantity of any given contaminant allowed according to the referenced standard:

CONTAMINANT	GRADE "D" max, concentration
Carbon Monoxide	20 PPM/v
Carbon Dioxide	1000 PPM/v
Condensed Hydrocarbons	5 mg./cu. meter
Objectionable Odors	None
Asbestos Fibers	0.01f/cc

1.06 DELIVERY:

- a. Deliver replacement parts, etc., not otherwise labeled by NIOSH or MSHA to job site in manufacturer's containers.

PART 2 - EQUIPMENT

2.01 AIR PURIFYING RESPIRATORS:

- a. Respirator Bodies: Provide half-face or full-face type respirators. Full-face respirators shall be equipped with a nose cup or other anti-fogging device.
- b. Filter Cartridges: Provide high efficiency particulate air (HEPA) filters that are at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter (NIOSH 42 CFR 84-P100 Filter) properly labeled with NIOSH designation and color coding. In addition, a chemical cartridge section may be added, if required, for solvents, spray poly and other contaminants that may be present in the work area.

2.02 SUPPLIED-AIR RESPIRATOR SYSTEMS:

- a. Provide equipment capable of producing air of the quality and volume required by the above referenced standards as applied to the job site conditions and crew size. Comply with provisions of this specification if more stringent than the governing standard.
- b. Face piece and Hose: Provide respirator face piece and air delivery hose provided by the same manufacturer that has been approved by NIOSH/MSHA as an approved Type C respirator assembly operating in Pressure Demand mode with a positive- pressure face-piece.
- c. Auxiliary backup system: In atmospheres which contain sufficient oxygen (greater than or equal to 19.5% oxygen) provide a Pressure-Demand full face piece supplied- air respirator equipped with an emergency backup HEPA filter.
- d. Escape air supply: In atmospheres which are oxygen deficient (less than 19.5% oxygen) provide a Pressure-Demand full face piece 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 Grade D Breathing Air located outside the Work Area which will automatically supply a continuous, un- interruptible source of air to each connected face piece and

hose assembly in the event of compressor shut-down, contamination of air delivered by compressor, power loss or other failure. Provide sufficient capacity in the back-up air supply to allow a minimum escape time of one-half hour times the number of connections available to the Work Area. Air requirement at each connection is the air requirement of the respirators in use plus the air requirement of an average sized adult male engaged in moderately strenuous activity. Contractor may submit to the Owner other escape respirator protection means.

- f. Warning Device: Provide a warning device. Locate so that the 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. No remediation procedure will commence until warning devices are fully operational . Connect alarm to warn of:
 - 1. Compressor shut down or other fault requiring use of backup air supply.
 - 2. Carbon Monoxide (CO) concentrations in excess of 5 PPM/v.
- g. Carbon Monoxide (CO) Monitor: Place the CO monitors in the air line between the compressor and back-up air supply and between the backup air supply and workers. Connect the 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 sounds 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 the compressor in a 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. Location of the compressor must be approved by the site administrator as well as the County.
- j. Air Intake: Locate air intake remotely from any source of vehicle exhaust or any exhaust from buildings.
- k. After Cooler: Provide an after-cooler at the entry to filter system which is capable of reducing temperatures to outside ambient air temperatures.

PART 3 - EXECUTION

3.01 GENERAL:

- a. Respiratory Protection Program: Comply with OSHA 29 CFR 1910.134, and 29 CFR 1926.1101, and other applicable regulations and guidelines.
- b. Require that respiratory protection shall be used at all times that there is any possibility of disturbance of asbestos-containing materials, mold-contaminated materials, or other contaminant exposures, whether intentional or accidental.
- c. Require that a respirator shall be worn by anyone in the Work Area at all times, regardless of activity, during the period starting with any operation which could disturb contaminants until the area has been cleared for re-occupancy.
- d. Regardless of airborne fiber concentrations on asbestos removal projects, the minimum level of respiratory protection used within the work area during gross removal shall be Powered Air Purifying Respirators unless prior approval is obtained from the Owner's Representative. Half-face air purifying respirators can be worn

during prepping, pre- cleaning, mastic removal, final clean-up, glovebag operations and the handling and loading out of bags or drums into dumpster, truck or trailers if approved by the County.

- a. For mold remediation projects and other contaminant removal projects, the minimum level of respiratory protection shall be half-face air purifying respirators with HEPA filters. As required by the specific contaminants involved, combination cartridge filters may need to include organic vapor filters, acid gas, or other specialty filters.
- b. All persons wearing respirators shall have been cleared to wear the respirator by a qualified physician, been properly fit tested on the specific respirator, and received respiratory protection training from a qualified person. Training must provide information on the need for respiratory protection, types of respirators and their protection factors, and the proper procedures for use and maintenance of respirators.
- c. IDLH Atmospheres will require use of pressure demand supplied air respirator (Type C) with auxiliary self-contained air supply or full face piece pressure demand SCBA certified by NIOSH with a minimum service life of thirty (30) minutes.

3.02 FIT TESTING:

- a. Provide fit testing of respirators for all personnel at least annually, in accordance with OSHA Standards 29 CFR 1910.134. Refit respirators for any individuals that undergo physical changes such as significant weight loss or gain, or other conditions that may affect respirator fit. Fit test upon issuance of a new respirator.
- b. Employees shall wear only respirators for which they have been properly fit tested. Maintain on site current fit test documents for all employees present, for the respirators actually being used.
- c. Fit Testing for negative pressure respirators (PF-10) shall be qualitative type. Fit testing for all other respirators with a protection factor of 50 or above shall be quantitative type tests.
- d. 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 check in accordance with the manufacturer's instructions and applicable regulations.

3.03 TYPE OF RESPIRATORY PROTECTION REQUIRED:

- a. Fibers: For purposes of this Section fibers are defined as all fibers regardless of composition as counted using the OSHA Reference Method (ORM) or NIOSH 7400 procedures or asbestos fibers of any size as counted using a Transmission Electron Microscope.
- b. Mold and Other Contaminants: No regulatory requirements currently govern exposure to airborne mold and its spores. However, EPA Guidelines recommend the use of a half-face, HEPA filtered respirator as a minimum, which is hereby made a requirement by these Specifications, together with appropriate eye protection. In lieu of half-face respirator and goggles, a full-face HEPA filtered respirator may be substituted.

3.04 AIR PURIFYING RESPIRATORS:

1. Negative pressure - half or full face mask: Supply a sufficient quantity of respirator filters approved for asbestos, so that workers can change filters during the work day.
2. Powered air purifying (PAPR) - half- or full-face piece mask: Supply a sufficient quantity of high efficiency (HEPA) respirator filters approved for asbestos so that workers can change filters at any time that flow through

the face piece decreases to the level at which the manufacturer recommends filter replacement. Provide an appropriate flow verification device on-site for use by employees. Require that the 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 to be decontaminated each time a worker leaves the Work Area.

3.05 TYPE C RESPIRATOR SYSTEM:

1. Air Systems Monitor: Continuously monitor the air system operation including the 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 in the use of the supplied air system, to monitor the system at all times it is in use. Assign no other duties to this individual which will take him away from monitoring the system.

3.06 VISITOR PROTECTION:

1. Contractor shall make available at least two PAPR respirators (in excellent condition) for any authorized visitors, inspectors or emergency personnel and provide all protective gear necessary for their exclusive use at any time. Whenever the respiratory protection factor is higher than PAPR, the Contractor shall also make available to authorized visitors, at least two (2) sets of respiratory equipment equivalent to that being utilized for the work.

END OF SECTION

DECONTAMINATION UNITS/TUNNELS

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Refer to Section 01503 "Temporary Facilities" for requirements concerning connection of the decontamination unit to existing building systems such as water, sewer and electrical.
- c. Refer to Section 01526 "Regulated Areas" for containment barrier requirements.

1.02 DESCRIPTION OF WORK:

- a. Provide Decontamination Units for projects as specified in the P.O.. Require that the Decontamination Unit be the only means of entry to and exit from the Work Area, except for any required emergency exits as described in Section 01526.
 1. Provide master keyed-alike locks at all project sites under this term contract. Combination locks will not be accepted.
 2. Provide ten master keys for the Decontamination unit locks to the Owner's Representative as required or when the initial locks are changed.
- b. Provide Tunnels for access between work areas, when needed or specified in the P.O..
- c. Provide Portable Building Enclosure Barriers when needed for abatement of portable exterior wall materials.

1.03 SUBMITTALS:

- a. As part of the General Term Bid Submittals, submit product data and/or shop drawings of the typical decontamination unit and tunnel to the Owner for review. Do not begin work until these submittals are approved by the Owner's.
- b. As part of specific project Pre-job Submittals, submit any additional details required to accommodate special site conditions encountered.

PART 2 – PRODUCTS

2.01 POLYETHYLENE SHEETING:

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

2.02 DUCT TAPE

- a. Provide duct tape in 2" or 3" widths as indicated, with an adhesive which is formulated to adhere to sheet polyethylene.

2.03 SPRAY CEMENT:

- a. Provide spray cement which is specifically formulated to adhere to sheet polyethylene.

2.04 SHOWER:

- a. Where required, provide a one-piece, leak-proof, prefabricated shower pan, approximately 3'-0" x 3'-0", a minimum of 6" high on all sides. Shower pan shall be at least 1/8" thick fiberglass, 18 gauge stainless steel with welded seams, 1/4" rigid PVC., or approved equal. Shower edges shall be smooth, without sharp elements. Shower bottom shall be slip-resistant or provided with a well-fitted impervious drain grate.
- b. Shower assembly shall provide soap holder and safety grab bar.

2.05 SHOWER HEAD AND CONTROLS:

- a. Provide a factory-made shower head that delivers a spray of water which can be adjusted for spray size and intensity. Feed shower with water mixed from hot and cold- water supply lines. Arrange the controls so that water temperature, flow rate and shut off is from inside the shower. Provide sump pump if required for proper operation.

2.06 FILTERS:

- a. Provide a filtration system on drain lines from showers or any other water source carrying asbestos-contaminated or lead-contaminated water from the Work Area and Decontamination Units. Provide units with disposable filter elements capable of filtering asbestos fibers to 5 microns, as indicated below. Connect so that discharged water passes primary filter and output from primary filter passes through secondary filter.
 - 1. Primary Filter - Passes particles sized 20 microns and smaller.
 - 2. Secondary Filter - Passes particles sized 5 microns and smaller.
- b. Provide any sump or booster pumps required for proper operation of the filtration system.

2.07 SHOWER WALLS:

- a. Shall be rigid, waterproof, continuous and cleanable with no visible cracks joints, or crevices to allow accumulation of waste or similar matter. The walls shall be substantial, sturdy, and capable of resisting any outward pressures occurring in the normal course of work. Structurally support shower walls as necessary for stability.
- b. Provide a soap holder and safety grab bars at each shower.

2.08 WATER HEATER:

- a. See Section 01503, Paragraph 2.03, of these Specifications.

2.09 PLYWOOD:

- a. 4' 0" x 8' 0" x 5/8" plywood panels conforming to PS-1 Standard, exterior grade, "CDX", in good condition.

2.10 LUMBER:

- a. 2 x 4 or 2 x 6 pressure-treated framing lumber, conforming to PS-20 Standard, stud grade or better, as required for the application.

2.11 MISCELLANEOUS:

- a. Provide nails, screws, sealants, and other items as required.

PART 3 - EXECUTION

3.01 GENERAL CONSTRUCTION CRITERIA:

- a. Decontamination Units and Tunnels shall be freestanding, self-supporting structures, constructed of plywood paneling on 2 x 4 wood framing, capable of supporting their own dead loads and of withstanding lateral dynamic loads (including winds to 35 mph) that can be expected during the Work. At exterior locations, secure units to building or provide wind bracing and make units waterproof from the exterior side (in addition to internal airtight containment barriers/seals).

The height and width of all decontamination units, tunnels, and portable building enclosures shall conform to these specifications and to the drawings included in Appendix B. Tunnels must have a height of 8'-0" to 10'-0", and a width of 4'-0" clear inside.

- b. Decontamination Units and Tunnels shall be sealed airtight using polyethylene sheeting and duct tape, applied to floors and to the interior surface of wall and ceiling panels. Use 2 layers (minimum) of 6 mil thick polyethylene sheeting to cover floors, walls and ceilings. At contractor's option, a polyethylene drop cloth may be added on top of the floor sheets, to protect the sheets from debris and damage.
- c. Subdivide decontamination units into multiple chambers and separate units and tunnels from work areas using doors/flaps made of polyethylene sheeting. Fabricate from two 6 mil polyethylene sheets, arranged so that each sheet fully overlaps the other and opens at opposite side of the adjacent sheet. Put arrows on the sheets to indicate direction of overlap and/or travel.
- d. Where the area adjacent to the decontamination unit is accessible to students, staff, or the public, ensure that the exterior side of walls are free from nails, splinters, and other elements that could cause damage and injury.
- e. Entrance/Exit Doors:
 - 1. Entrance doors to decontamination units shall be substantial, solid, and fully operational units, simultaneously providing adequate access and security. Doors shall be solid core, or at a minimum, made from 5/8" plywood panels and shall be secured using standard builder's hardware, of quantity, type and quality as required by the application. Nailing door to decontamination unit is unacceptable.
 - 2. Provide a minimum of 2 hinges at each door; provide heavy-duty latch and hasp sets with vandal resistant heavy duty locks. All locks for this contract shall be master-keyed alike; provide 10 master keys to Owner with the General Term Bid Submittals. Reinforce plywood door as necessary for installation of hardware and for proper operation.
 - 3. Post required asbestos warning sign, Ten-Day Notification (stamped by DERM), and all emergency phone numbers and procedures, on the outside of the Decontamination Unit door. Post the decontamination procedures and personnel monitoring results in the Clean Room.
 - 4. Provide a standard, overlapping polyethylene flap immediately behind the door, to serve as back-up airflow and sight control closure. Post an asbestos warning sign on the outer side of this flap.
- f. Alternate methods of providing decontamination facilities and tunnels may be substituted if approved by the County. Submit manufacturer's product data and shop drawings to the department for review. Do not proceed with such method(s) without prior authorization of the Owner's Representative. Portable decontamination units

must meet the minimum standards specified herein.

3.02 DECONTAMINATION UNITS (PERSONNEL):

- a. Decontamination units shall be subdivided in a serial arrangement of spaces separated by polyethylene sheet bulkheads and access flaps.
 1. Units for projects involving remediation of friable asbestos materials shall be "Five-Stage Decontamination Units", containing a Clean Room, Shower, and Equipment Room separated by Air Locks (See Appendix B for drawing details).
 2. Units for projects involving remediation of non-friable asbestos materials, and on specific mold other environmental contaminant remediations (when called for in the P.O.) shall be "Three-Stage DRY or WET Decontamination Units", (See Appendix B for drawing details for Three-Stage Decon Unit).
 3. On projects involving standard mold remediations or various cleanup activities, a Two-Stage "Mini Decontamination Unit", containing a Clean Room and an Equipment Room, may be used. (See Appendix B for drawing details).
 4. On minor projects, when specified in the P.O., a wash pad 6' x 6' or a One- Stage "Mini Decontamination Unit" may be used. Both include wash bucket and towels for personal decontamination.
- b. All decontamination units shall be a minimum of 4'-0" wide and 8'-0" high, and each individual subdivided space shall be 4'-0" minimum in length. Therefore, 5-stage units will be a minimum of 20 feet in length and 3-stage units will be a minimum of 12 feet in length, 2-stage Mini-Decon units will be a minimum of 8 feet in length. Material Decontamination Units to be a minimum of 12 feet in length.
- c. Clean Room:
 1. The Clean Room is the first chamber of the decontamination unit, serving as the entrance/exit access and as a changing area to put on protective clothing. This room must be physically and visually separated from the rest of the building.
 2. On jobs requiring a shower, provide individual secure storage in the Clean Room for workers' and authorized visitors' valuables and street clothes. Provide a storage locker for employee and two visitor lockers.
 3. Locate the temporary power panel and the manometer in the Clean Room, to prevent tampering and to protect them from the elements.
 4. Maintain in the Clean Room an adequate supply of protective disposable suits and disposable towels. Provide a full-length, plastic mirror in the Clean Room. Require all persons to visually check their protective equipment in mirror before entering the Work Area.
- d. Shower Room:
 1. The Shower Room must be located in such manner that all persons leaving the work area are forced to travel through the shower. Workers headed out of the Work Area must remove contaminated clothing in the Equipment Room, shower and remove the respirator in the Shower Room, and dress in street clothes in the Clean Room. Separate the Shower Room from both the Clean Room and the Equipment Room by Air Locks, with standard overlapping polyethylene flaps.
 2. Construct the Shower Room by providing a shower pan and shower walls in a configuration that will cause

water running down walls to drain only into the pan. At the two access openings, provide heavy-duty, opaque rubber curtains that overlap the shower curb and channel water into the pan; curtains must have enough weight to hang vertically against the pull of the negative pressure and ensure that water from showering does not splash into the Clean or Equipment Rooms or the Air Locks.

3. Install a free flowing floor drain in the shower pan with an integral grating cover. Provide flexible shower head with independent hot and cold water controls. Shower must be fully operable at all times during removal phase of the Work.
 4. Unit must have controllable, hot and cold running water as well as drainage, as necessary for a complete and operable shower; temporarily extend building water service and provide water heating equipment as required for site conditions. As part of the specific General Term Contract Submittals, indicate proposed method and equipment for water supply, heating, and disposal, and obtain Owner's approval. Coordinate with Asbestos Project Inspector, prior to start of work, for acceptable service connections and locations for equipment.
 5. Pump waste water from shower drain through 20 micron and 5 micron waste water filters prior to discharge into building's sanitary system. Replace filters as necessary. Alternately, pump wastewater into drums lined with disposal bags, adding water absorbing/solidifying granules to the bags. Dispose of drummed/bagged wastewater as asbestos waste.
 6. Provide a continuously adequate supply of soap and maintain in a sanitary condition. Provide a continuously adequate supply of disposable towels. Locate towels immediately adjacent to the shower in the "clean" air lock, hung on towel bars or other suitable holders to keep supply dry and orderly.
- e. Equipment Room:
1. The Equipment Room is the chamber used to access the Work Area; it is a transition space that is considered part of the contaminated area. The Equipment Room shall contain a receptacle lined with a disposal bag for discarding of contaminated protective clothing prior to entering the Shower Room. All disposal items including disposal suits used in the Work Area shall be placed in the disposal bag located in the Equipment Room prior to proceeding to the shower. All equipment removed shall be washed in the shower or load out before removing from the decon.
 2. The Equipment Room is the portion of the Decontamination Unit that abuts the existing building (Work Area). Provide non-destructive attachment to the building as required for stability. Seal airtight, with polyethylene and duct tape, the joint between the unit and the existing building. Provide a standard triple flap access door at the opening to the Work Area.

3.03 MATERIAL DECONTAMINATION UNITS:

- a. When indicated in the P.O. or requested by the Owner's Representative, the contractor will provide a separate Material and Equipment Decontamination Unit (Load-out Unit), for decontamination and removal of equipment, materials, and bagged waste from the Work Area.
- b. The Material Decontamination Unit shall be a three-stage unit of same construction and details as the Personnel Decontamination Unit, and shall be subdivided in a serial arrangement of spaces separated by polyethylene sheet bulkheads and access flaps. It shall contain a Clean Room, Holding Room, and a Wash Room . (See Appendix B for drawing details).
- c. The Material Decontamination Unit shall be a minimum of 4'-0" wide and 8'- 0" high, and each individual subdivided space shall be 4• 0• minimum in length.

- d. When site conditions permit, locate the Material Decontamination Unit at opposite side of Work Area from the Personnel Decontamination Unit. When that arrangement is not possible, the Material Decontamination Unit may be located adjacent to the Personnel unit and accessed from the Equipment Room (See Appendix B for drawing details).
- e. When site conditions are very limited, preventing construction of a separate Material Decontamination Unit, decontamination and load out of waste may be made through the Personnel Decontamination Unit, upon prior approval by the Owner's Representative. In such cases, the Shower will act as a Wash Room, except that for Three Stage Units, a wash pan must be placed in the Equipment Room, both for the decontamination of materials and to permit decontamination of suits and respirators using an airless sprayer.
- f. Do not allow personnel to enter or exit work area through the Material Decontamination Unit.
- g. Wash Room:
 - 1. Provide Wash Room for cleaning outside of single-bagged or wrapped asbestos-containing waste materials passed from the work area. Separate this room from the Work Area or Equipment Room, as well as from Holding Room, by standard polyethylene overlapping flaps.
 - 2. Provide a one-piece, leak-proof wash pan with 6" high curbs/sides inside the Wash Room to hold waste water from material decontamination by airless sprayer. Wash pan size should be an adequate size to perform loadout.
 - 3. Provide sufficient space to permit workers to handle and wash each bag and insert same in a clean second bag after washing.
- h. Holding Room:
 - 1. Provide a Holding Room as a buffer and storage location for decontaminated, double bagged asbestos waste being passed from the Wash Room.
 - 2. Separate the Holding Room from adjacent rooms by standard polyethylene overlapping flaps, to prevent waste from being carried directly to Clean Room.
- i. Clean Room:
 - 1. Provide a Clean Room to serve as an air lock, to separate the Holding Room from the building exterior.
 - 2. Control Clean Room entrance/exit with a lock-able, solid door and polyethylene single flap as specified for standard Decontamination Unit entrances above.

3.04 TUNNELS:

- a. When the project involves remediation of multiple adjacent rooms that are not directly interconnected, a Tunnel may be erected to consolidate all spaces into a single Work Area, as designed by the County and requested by the P.O..
- b. Tunnels shall be a minimum of 4'-0" wide and 8'-0" high, and shall be self-supporting, constructed of plywood on wood framing and sealed airtight with polyethylene sheeting as specified herein above. Tunnels shall be separated from each connecting Work Area by standard overlapping flaps.
- c. The Owner's Representative will review site conditions at each project location. When directed by the Owner's

Representative, or if tunnel length exceeds 100', provide an emergency exit door from the tunnel to outside of containment. The door shall be operable only from the inside, without the use of special tools, except for cutting of the polyethylene barrier as outlined for "Emergency Exits" in Section 01526 of these Specifications.

3.05 APPROVAL OF LAYOUT:

- a. If the Contractor wishes to employ prefabricated units or to modify the unit layout in any way, then he/she must submit a proposal with backup information as part of the Plan of Action, in the Term Bid Submittal or in the specific project's Pre-Job Submittals. Provide data and details as outlined in Section 01301 and the General Conditions. Submittal of data does not guarantee department approval; only approved units may be used.

3.06 CLEANING OF DECONTAMINATION UNITS:

- a. Clean debris and residue from inside all rooms of the Decontamination Units daily. Wash and clean debris from the shower pan and drain daily. Wipe all surfaces of the Shower Room and the Clean Room with a disinfectant on a daily basis.
- b. If the Clean Room portion of the Decontamination Unit becomes contaminated with asbestos-containing debris, or if air monitoring reveals that airborne fiber levels reach the PEL, all work shall cease immediately until cleanup procedures are completed. The contractor shall erect a temporary mini-decontamination unit, as outlined in Section 13283 of these Specifications, immediately outside of the Clean Room, to provide a buffer between the contaminated space and the rest of the building. After cleanup is complete and air clearance successfully passed, tear down the temporary unit and resume work.

3.07 SIGNS:

- a. Post a commercially manufactured warning sign at each entrance to the Work Area, on both the solid outer door and the inner polyethylene flap. Sign shall conform to Paragraph 3.03 of Section 01526 of these Specifications.
- b. Signs shall be provided in all languages regularly spoken in the community where the project is located. The contractor shall post and maintain warning signs on all accessible sides of the decontamination unit, material decontamination unit and tunnels, as well as any hard barriers separating the work area from occupied portions of the building.

END OF SECTION

**SECTION 01712
PROJECT DECONTAMINATION/OTHER CONTAMINANTS**

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Negative Pressure System Section 01513
- c. Regulated Areas Section 01526
- d. Worker Protection Section 01561
- e. Respiratory Protection Section 01562
- f. Remediation of Mold-Contaminated Materials Section 13283
- g. Remediation of Other Environmental Contaminants Section 13281

1.02 DESCRIPTION OF THE WORK:

- a. This Section outlines procedures for decontamination of surfaces and/or spaces, visibly or potentially contaminated by mold or other contaminants, as follows:
 - 1. Decontamination/cleaning of contaminated surfaces where it has been determined by County that the surface to be cleaned is not structurally damaged and the contamination has not penetrated the material.
 - 2. Fine cleaning/decontamination of materials/surfaces in work area after removal of visible gross contamination.
 - 3. Cleaning of existing surfaces/spaces with no visible contamination, but potentially exposed to mold spores or other microscopic contaminants.
 - 4. Encapsulation/protection of clean surfaces with approved biocide or anti- microbial paint.
- b. The decontamination effort involves the cleanup of all surfaces, equipment and objects and the filtering of the air, in the subject spaces, to remove potential microscopic mold spores and other contamination.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- a. Amended Water: Provide water to which a surfactant has been added. Use a mixture of one ounce of a surfactant as specified above, mixed with five gallons of water.
- b. Airless Sprayer: An airless sprayer, suitable for misting the air with water, and for application of anti-microbial paint. Sprayer shall be electric or manual, equipped with a wand at the end of a hose, capable of delivering a stream, a spray, or a mist of liquid.

- c. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems which are rated 99.97% efficient to 0.3 microns particulate size.
- d. Disposal Bags: Provide 6-mil thick minimum, leak-tight polyethylene bags.
- e. Anti-Microbial Paint:
 - 1. Latex-based paint coating that contains a manufacturer-mixed fungistat that inhibits fungal growth, such as Portersept 3830, Fosters 4020, or approved equal.
 - 2. Organosilane Quaternary Amine based biostat coating that disrupts mold cell membranes (Aegis Microbe Shield or approved equal).
- f. Biocide:
 - 1. Chemical solution formulated to neutralize and eliminate viral, bacterial, and/or fungal contamination from surfaces. Specific product shall be appropriate for the type of contamination encountered. Products must be safe for human exposure after drying.
 - 2. Submit MSDS information for each product to be used in this contract as part of the General Term Contract Submittals.
- g. Contaminated Equipment: It is the Contractor's responsibility to arrive on site at the start of the job with equipment that is either "contaminant free", or with contamination "secured", e.g., sealed in an airtight plastic bag. The contractor's equipment surfaces will be inspected for surface mold contamination at the start of the job, periodically throughout, and at the end of the job. Inspection may also include the collection of surfaces (strip tape) samples by the Owner on any equipment that appears to be contaminated.
 - 1. Typical equipment to be inspected can include respirators, hoses, vacuums, shower units, ladders and scaffolding, shovels and scrapers, negative air machines, and vehicles (truck bed). Equipment that is difficult to decontaminate properly should be sealed in bags and not opened until the bags are placed within a work area.
 - 2. If equipment appears to be contaminated with asbestos or other toxins at the time of arrival of the contractor on the job site, the Owner may deem it unacceptable for use (refuse its entry to the job site). Contractor will be responsible for any additional costs incurred due to delays or schedule changes.

PART 3 - EXECUTION

3.01 GENERAL:

- a. These work guidelines apply to remediation of microbial, fungal, or other contamination, throughout Lee County buildings and include the cleanup and decontamination of all contaminated materials. The provisions detailed in these guidelines are intended to prevent fungi and other contaminants from migrating to areas outside of the work area during remediation/cleanup activities.
- b. Clean non-porous (e.g., metals, glass, and hard plastics) and semi-porous (e.g., wood and concrete) materials that are structurally sound using a detergent solution or a biocide product and amended water. All materials to be reused should be dry and visibly free from mold. Owner will conduct inspections to confirm the completion and effectiveness of the cleanup/decontamination.
- c. The use of gaseous ozone or chlorine dioxide is prohibited.

3.02 CLEANING AND DECONTAMINATION PROCEDURES

a. General/Mold and Other Contaminants:

1. Areas/rooms to be cleaned and decontaminated shall be unoccupied. Prior to start of cleanup activities, protect the work area and adjacent spaces in accordance with the criteria outlined in Sections 13283 and 13281 of these Specifications, based on the size/area of the contamination. Provide containment barriers, critical seals, drop cloths, decontamination units, warning signs, barricade tape and other items to properly demarcate and/or isolate the work area as outlined therein.
2. Provide adequate personal and respiratory protection to all personnel performing or supervising the work, in compliance with OSHA regulations, EPA Mold Remediation Guidelines, all other applicable regulations, and the prevalent industry standards.
3. Provide air filtration devices as described in Section 01513. When required by the extent of the contamination, place the work area under negative pressure as described therein.
4. Cleaning/decontamination shall always proceed from top to bottom of spaces/surfaces. Areas of highest concentration shall be cleaned of gross contamination prior to the fine cleaning of all surfaces.
5. To prevent cross-contamination of surfaces and ensure removal of the micro-organisms, cleaning rags and water shall be changed often. Rags shall be wet with the cleaning solution and used for one pass and then folded with dirty side inward. The folded rag shall be used for a second pass and folded again for a final pass. The rag shall then be discarded in a disposal bag and replaced with a new clean rag.
6. HEPA-filtered vacuum equipment shall be free of mold-contamination. The Project Inspector will reject equipment that appears contaminated. HEPA vacuums shall be equipped with head attachments lined with rubber guards to prevent scarring or scratching of surfaces being cleaned.
7. Contaminated materials, such as rags, mops, and HEPA vacuum filters and collected debris, shall be placed in sealed plastic disposal bags. There are no special requirements for the disposal of moldy materials; debris and cleaning discards shall be disposed of as construction debris in an approved landfill. No on-site disposal shall be permitted.
8. All cleaned areas shall be left dry and visibly free from contamination and debris. At completion of Cleaning/Decontamination, the contractor shall notify the County Project Manager (County Project Manager), who will conduct an inspection of the area to determine if acceptable. Upon on County's assessment that the area is acceptable, the County Project Manager will give the contractor the clearance to tear down containment. At the Owner's discretion, based on specific circumstances of individual projects, applicable clearance testing may be performed. If such test fails, the contractor shall re-clean the area.

b. Decontamination/Cleaning of Mold-Contaminated Surfaces:

1. Before start of cleaning operations, mist all work area surfaces with an approved biocide disinfectant. Wait sufficient time to allow product to neutralize contaminants based on manufacturer's bridging time recommendations.
2. Provide a 6 mil. polyethylene drop cloth immediately below the work surfaces, to 6 feet out from the walls, in order to contain and collect gross contamination.
3. Surfaces exhibiting visible mold growth shall be cleaned using a detergent solution or an approved biocide product. The gross contamination shall be removed by wiping of the surface using rags dampened with a

detergent solution, cleaning from top to bottom as described above.

4. After gross contamination is removed and the surfaces have dried, carefully and thoroughly HEPA vacuum horizontal surfaces and re-wipe the vertical surfaces.
5. The Project Inspector will conduct a visual inspection of the disinfected surfaces, to determine if the area is acceptable; if debris or contamination is found, the surfaces shall be re-vacuumed or fine cleaned using rags and the detergent solution.
6. Upon completion and acceptance of cleaning by the ERP!, fully decontaminate floor surfaces by mopping with a detergent or approved biocide solution.

c. Decontamination of Animal Waste and Other Contaminants:

1. Before start of cleaning operations, mist all work area surfaces with an approved biocide disinfectant. Wait sufficient time to allow product to neutralize contaminants based on manufacturer's bridging time recommendations.
2. Provide a 6 mil. polyethylene drop cloth immediately below the work surfaces, to 6 feet out from the walls, in order to contain and collect gross contamination.
3. Remove gross debris from surfaces with shovels, squeegees, and/or other tools, collecting debris in 6-mil waste bags for disposal.
4. Clean contaminated surfaces using a strong detergent solution and/or an approved biocide product.
5. After gross contamination is removed and the cleaned/disinfected surfaces have dried, carefully and thoroughly HEPA vacuum the horizontal surfaces.
6. The Project Inspector will conduct a visual inspection of the disinfected surfaces, to determine if the area is acceptable; if debris or contamination is found, the surfaces shall be re-vacuumed or fine cleaned using rags and the detergent solution.
7. Upon completion and acceptance of cleaning, fully decontaminate floor surfaces by mopping with a detergent or approved biocide solution.

c. Fine Cleaning/Decontamination of Surfaces:

1. Fine cleaning of surfaces where no visible mold or other contamination is observed, but only suspected, shall follow the procedures outlined herein.
2. Carefully HEPA vacuum all horizontal surfaces and wipe with detergent or approved biocide the vertical surfaces, as directed. Work shall proceed from the top to bottom, from the top of walls to the floor. Where ceiling tiles have been removed due to mold or other contamination, the remaining metal grid shall be HEPA vacuumed and wet wiped as outlined herein above. Carpets shall be removed and discarded, unless otherwise directed by the Owner. If indicated to remain, carpets shall be shampooed and vacuumed using water extractors equipped with HEPA filtration systems.
3. Perform fine cleaning of surfaces using damp rags and detergent or approved biocide solution as specified herein above.

4. Upon completion and acceptance of cleaning, fully decontaminate floor surfaces by mopping with a detergent or approved biocide solution.
- d. Encapsulation of Surfaces With Antimicrobial Coating or Sanitizing Agent:
 1. After cleaning of surfaces, and where directed by the P.O., encapsulate designated surfaces with an approved antimicrobial coating or anti-bacterial sanitizing agent.
 2. Apply coating using an airless sprayer. Sprayer shall be completely dry prior to application of coating to prevent dilution of the product. Product shall be applied full-strength, or as recommended by the manufacturer for the specific application, and shall not be diluted further.
 3. Spray the surfaces with smooth even passes, applying a thin, even layer of the material. Continue the application until manufacturer's recommended film thickness is achieved. Application shall be uniform throughout the surface, including any surface irregularities, joints, nooks and other hard to reach areas, to ensure complete coverage/protection of the surface/material. If a second coat is required for proper coverage, wait sufficient time to allow product to dry, based on manufacturer's bridging time recommendations.

END OF SECTION

SECTION 01714 WORK AREA CLEARANCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- b. Visual Inspection: Prerequisite to air testing: Sections 01711, 01712
- c. Air Monitoring: By Independent Test Laboratory: Section 01410

1.02 SUMMARY:

- a. This Section sets forth clearance criteria to establish the completion of the remediation work and to determine that the work area is safe for re-occupancy. The Contractor must comply with the requirements and limits of this Section.
- b. For Mold and Other Contaminant remediations, clearance shall be based on the visual inspection and assessment conducted by the County Project Manager. On specific projects, based on the type of contaminant, the Owner may require a clearance test applicable to the particular contaminant and project conditions.
- c. The Work is Complete when each Work Area is visually clean and accepted by the County Project Manager.

1.03 FINAL VISUAL INSPECTION:

- a. A Final Visual Inspection, described herein below shall be performed by the County Project Manager to determine whether the work area is safe for re-occupancy (on Asbestos projects, the inspection will determine whether the work area is ready for AHERA final air testing).

PART 2 - PRODUCTS (NOT APPLICABLE)

3.01 FINAL VISUAL INSPECTION:

- a. When the final cleaning is complete, the Environmental Contractor's on-site Supervisor will perform a visual inspection of the work area to verify completion prior to requesting the Final Visual Inspection from the County Project Manager. The contractor's on-site supervisor shall then notify the County Project Manager at least twenty-four (24) hours in advance that the area is ready for Final Visual Inspection and/or Final Clearance Testing. On Asbestos Abatement Projects, the "Request for Final Air Clearance Testing" form must be received on-site by the County Project Manager prior to conducting the Final Visual Inspection. The Final Visual Inspection will be performed by both the Contractor's Supervisor and the County Project Manager. Upon County Project Manager approval, the work area will be encapsulated as directed. On Asbestos projects, the required AHERA final testing will then be scheduled by the County Project Manager. If the work area is found to be "unacceptable," the contractor's supervisor shall reclean/decontaminate work area and reschedule the Final Visual Inspection and Final Air Clearance Testing. The contractor will be responsible for any expenses incurred by the Owner as a result of failed inspections and/or final air testing. The contractor on-site supervisor shall notify the Owner's Representative at least twenty- four (24) hours in advance of the time the area will be ready for Re-inspection of work area(s), Final Visual Inspection and/or Final Clearance Testing.

3.02 WORK AREA CLEARANCE:

- a. Work Area Clearance Authorization/All Projects: After satisfactory completion of the Visual Inspection, , the County Project Manager will authorize the Contractor to complete the remediation and remove the identified containment enclosure(s) from the work area.
- b. The date of Substantial Completion shall be the date that the County Project Manager determines the completion of the work based on the successful Visual Inspection (Mold and Other Contaminants).

3.03 REMOVAL OF WORK AREA ISOLATION (TEAR-DOWN):

- a. After all requirements of Sections 01711, 01712, and this Section have been met:
 - 1. Shut down and remove the Pressure Differential System. Seal the HEPA filtered fan units (Inlet and Supply), HEPA vacuums and similar equipment with 6 mil thick polyethylene sheet and duct tape to form a tight seal at intakes end before being moved from the Work Area.
 - 2. Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any quantities of residual material found upon removal of the plastic sheeting by wet wiping or HEPA filtered vacuum cleaners. Dispose any residual materials in accordance with Sections 13282,13283, and all applicable regulations.
 - 3. Remove the Decontamination unit.
 - 4. Remove all equipment, materials, debris from the work site.
 - 5. Contractor must tear-down work area containment and return work area to the Owner within (24) Twenty-Four hours of notification of completion by the Project Manager

END OF SECTION

**SECTION 13283
REMEDATION OF MOLD-CONTAMINATED MATERIALS**

PART 1 - GENERAL

1.01 RELATED WORK:

- a. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.

1.02 RELATED WORK SPECIFIED ELSEWHERE:

- a. Temporary Pressure Differential System Section 01513.
- b. Regulated Areas Section 01526.
- c. Worker Protection Section 01561.
- d. Decontamination Units/Tunnels Section 01563.
- e. Project Decontamination/Other Contaminants Section 01712.

1.03 SUBMITTAL:

- a. Refer to Section 01301 for Submittal Requirements.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- a. Surfactant: 50/50 mix of polyoxyethylene ester and polyoxyethylene ether, or equal.
- b. Amended Water: Provide water to which a surfactant has been added. Use a mixture of one ounce of a surfactant as specified above, mixed with five gallons of water.
- c. Anti-Microbial Paint: provide a fungicidal anti-microbial coating designed specifically for treatment of surfaces to retard and/or inhibit growth of mold. White- Foster 40-20 or equal. Clear-Foster 40-51 or equal.
- d. Biocide: Chemical solution capable of killing mold, bacteria, and viruses, while remaining safe to human health. Bio-Cide 100 or equal.
- e. Polyethylene Sheet: Provide polyethylene sheet as specified in Section 01526.
- f. Duct Tape: Provide duct tape as specified in Section 01526.
- g. Spray Cement: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- h. Caulking: Provide silicone caulking for sealing edges.
- i. Disposal Bags: Provide 6-mil thick minimum, leak-tight polyethylene bags.
- j. Disposable Clothing: Clothing shall consist of coverall, head cover and foot cover. Enough personal protective equipment for workers and all Authorized Visitors.
- k. Airless Sprayer: An airless sprayer, suitable for misting the air with water, and for application of anti-microbial

paint. Sprayer shall be electric or manual, equipped with a wand at the end of a hose, capable of delivering a stream, a spray, or a mist of liquid.

- I. Negative Air Filtration Units: Air filtration devices shall utilize High Efficiency Particulate Absolute (HEPA) filtration systems, 99.97% efficient to 0.3 microns particulate size. The negative air filtration unit shall be equipped with the following:
 1. Magnehelic gauge to monitor the unit's air pressure difference across the filters and be able to interpret magnehelic readings to cfm.
 2. Automatic shut off for filter failure or filter absence.
 3. Audible alarm with flashing red light for unit shutdown.
 4. Amber flashing warning light for filter loading.
 5. Must have safety system that prevents unit from being operated with the HEPA filter in backwards.
- m. Scaffolding: Scaffolding, as required to accomplish the specified Work, shall meet all applicable safety regulations.
- n. Vacuum Equipment: All vacuum equipment utilized in the Work Area shall utilize HEPA filtration systems which are rated 99.97% efficient to 0.3 microns particulate size.
- o. HEPA-filtered water extractor: All HEPA-vacuuming of carpeting or other fabric shall be performed using a HEPA-filtered water extractor.
- p. Other Tools and Equipment: The Contractor shall provide other suitable tools for the stripping, removal, and disposal activities including but not limited to hand-held scrapers, squeegees, sponges, rounded edge shovels, wire brushes and carts. No brooms shall be allowable in any containment area.
- q. Contaminated Equipment: It is the Contractor's responsibility to arrive on site at the start of the job with equipment that is "contaminate free" or with contamination "secured", e.g., sealed in an airtight plastic bag. The contractor's equipment surfaces will be inspected for surface mold contamination at the start of the job, periodically throughout, and at the end of the job. Inspection may also include the collection of surfaces (strip tape) samples by the Owner on any equipment that appears to be contaminated.
 1. Typical equipment to be inspected can include respirators, hoses, vacuums, shower units, ladders and scaffolding, shovels and scrapers, negative air machines, and vehicles (truck bed). Equipment that is difficult to decontaminate properly should be sealed in bags and not opened until the bags are placed within a work area (controlled environment).
 2. If equipment appears to be contaminated with asbestos/mold at the time of arrival of the contractor on the job site, the Owner may deem it unacceptable for use (refuse it entry to the job site). Contractor will be responsible for any additional costs incurred due to delays or schedule changes.

PART 3 - EXECUTION

3.01 GENERAL:

- a. These work guidelines apply to microbial remediation projects throughout the County and include the removal and disposal, or the cleanup and decontamination, of microbially contaminated materials. The provisions

detailed in these guidelines are intended to prevent fungi from migrating to areas outside of the work area during remediation activities.

- b. Non-porous (e.g., plaster, metals, glass, and hard plastics) and semi-porous (e.g., wood and concrete) materials that are structurally sound and are visibly moldy shall be cleaned and reused. Cleaning shall be done using a detergent solution. Porous materials such as ceiling tiles and insulation, and walkouts with more than a small area of contamination shall be removed and discarded. Porous materials with limited contamination will be reviewed by the Owner and their disposition or cleaning will be specified in the P.O.. All materials identified to be reused should be dry and visibly free from mold. Owner will conduct inspections to confirm the effectiveness of remediation work.
- c. The use of gaseous ozone or chlorine dioxide for cleaning purposes is prohibited. The Contractor shall submit Material Safety Data Sheets to the Owner for the biocide and/or detergent products to be used for mold decontamination. No product will be used until Owner acceptance is obtained.
- d. Establish work area-controlled access to prevent unauthorized entry into the Work space. The Contractor shall maintain a written log of all persons entering and exiting the Work Area, including personal protection. As required, provide additional construction barriers (fences) as needed to keep foot traffic away from work area.
- e. Erect pre-printed warning signs and warning tape around the workspace and at every point of potential entry from the outside. The warning signs shall be a bright color (NO BLACK COLOR COPIES) so that they will be easily noticeable and shall comply with requirements of Section 01526 of these Specifications.

3.02 WORKER PROTECTION:

- a. Before beginning Work with any material for which a Material Safety Data Sheet has been submitted, provide workers with the required training and protective equipment. Require that appropriate protective equipment be used at all times.
- b. Respiratory protection shall be in accordance with EPA's "Mold Remediation In Schools & Commercial Buildings" and the OSHA Respiratory Protection Standard (29 CFR 1910.134).
- c. Personnel must be trained in the handling of hazardous materials and equipped with required respirators with HEPA filter cartridges. Workers shall wear a single protective suit, gloves, eye and respiratory protection. The minimum respiratory protection shall be a ½ face respirator, N95 face mask are not acceptable.
- d. For Worker protection – Training / Medical Examinations / Fit Testing / Workers Acknowledgment requirements, reference Section 01561.

3.03 GENERAL CLEANING PROCEDURES/SURFACE CLEANING:

- a. Surface Cleaning Work – The Environmental Contractor will be required to perform Mold Surface Cleaning Activities on Horizontal and Vertical Surfaces..
- b. When performing cleaning, begin with any loose objects and furniture, if applicable, that are to be decontaminated or removed from the area.
 - 1. The work area shall be unoccupied.
 - 2. The County Project Manager will monitor the remediation activities. No work shall proceed until the Inspector

has reviewed the preparation of the work area and has given visual to start.

3. Provide controlled access with zipper or double flap entrance, demarcation with warning signs and tape. Provide a 6-mil polyethylene sheet to be used as a drop- cloth on the floor at the area of work. The drop cloth shall be of sufficient size to prevent debris and overspray to contaminate the floor. Adequate Negative Air Filtration Unit(s) shall be activated immediately adjacent to the work area and maintained in operation during execution of the work. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are required.
4. HEPA vacuum all surfaces (horizontal and vertical) before wet-wiping all solid, impervious surfaces with a biocide for said objects as required by P.O..
5. Objects that are fabric covered shall be thoroughly HEPA vacuumed, or discarded as un-cleanable if so designated by P.O.
6. Items designated by the Owner's Representative as "un-cleanable" shall be single bagged or wrapped in polyethylene and duct tape and disposed of as general construction debris.
- c. After removal of loose objects, always work from the top down, starting at ceilings, proceeding to walls and fixed objects and finishing at floor surfaces.
- d. HEPA vacuum all surfaces prior to wiping of surfaces with a biocide solution. Start by overlapping passes across the surface until complete. Then, turn at 90° and repeat the operation. Wet mop floors using a similar procedure. Clean surfaces by wet-wiping, and using an approved biocide with clean cloth rags. Use each surface of a rag only once and then dispose of as contaminated waste. Do not perform dry dusting or dry sweeping.
- e. When required in the job specific details, provide a fungicidal anti-microbial coating designed specifically for treatment of surfaces to retard and/or inhibit growth of mold. White- Foster 40-20 or equal. Clear-Foster 40-51 or equal.
- f. Final Inspection Acceptance/Surface Cleaning
 1. After the work area decontamination is complete, request the final acceptance inspection from the County Project Manager. When specified in the P.O., fog the entire work area with a biocide solution and continue negative air in work area for 24 hours. Seal all exterior doors to work areas with 6 mil poly.
 2. At the Owner's option, Final Air Testing maybe required to establish owner acceptance and project demobilization.

3.04 REMOVAL (MINOR):

- a. Minor Work - The Environmental Contractor will be required to perform Mold Remediation Activities on small Isolated surface removal areas of various building components, not limited to ceiling tiles, small spot areas on walls, bulletin boards, FF&E etc.
 1. The work area shall be unoccupied.
 2. The County Project Manager will monitor the remediation activities. No work shall proceed until the Inspector has reviewed the preparation of the work area and has given visual to start.
 3. Provide controlled access with zipper or double flap entrance, demarcation with warning signs and tape. Provide a 6-mil polyethylene sheet to be used as a drop- cloth on the floor at the area of work. The drop cloth shall be of sufficient size to prevent debris and overspray to contaminate the floor. Adequate Negative Air Filtration

Unit(s) shall be activated immediately adjacent to the work area and maintained in operation during execution of the work. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are required.

4. Removal of small sections of contaminated surfaces - Workers shall seal the contamination by placing a single layer of polyethylene sheeting over an area slightly larger than the contamination and secure it with duct tape. One worker will then cut out or remove the contaminated material beyond the duct tape while a second worker uses the nozzle of a HEPA vacuum next to the cut. The contaminated piece will be placed in a 6 mil plastic or 6 mil disposal bags for disposal.
5. If additional scope of work is discovered by concealment, workers shall immediately stop and notify County Project Manager of additional discovered work. The County representative will perform an assessment and advise the Environmental Contractor on how to proceed.
6. Contaminated materials that cannot be cleaned should be removed from the building in sealed 6 mil plastic or 6 mil disposal bags. There are no special requirements for the disposal of moldy materials, but all contaminated materials shall be disposed of as construction debris by the Environmental Contractor in an approved landfill. "Do not dispose remediation waste at facility on site".
7. The work area and areas used by remediation workers for egress should be cleaned with a damp cloth and/or mop and a detergent solution as required.
8. All areas should be left dry and visibly free from contamination and debris
9. Before exiting the containment, workers shall thoroughly HEPA-vacuum their protective suits, gloves, and respirators. The suits and gloves shall be removed at the decontamination wash station, while another worker holds the HEPA- vacuum nozzle near the worker removing the suit. Used suits and gloves will be immediately placed in bags for disposal. Respirators are to remain until suits and gloves are sealed within the disposal bags.
10. When required in the job specific details, provide a fungicidal anti-microbial coating designed specifically for treatment of surfaces to retard and/or inhibit growth of mold. White-Foster 40-20 or equal. Clear-Foster 40-51 or equal.

b. Final Inspection Acceptance/Minor Work

- (1) After the work area decontamination is complete, request the final acceptance inspection from the County Project Manager. When specified, fog the entire work area with a biocide solution and continue negative air in work area for 24 hours. Seal all exterior doors to work areas with 6 mil poly.
- (2) At the Owner's option, Final Air Testing maybe required to establish owner acceptance and project demobilization.

3.05 REMOVAL (MAJOR):

- a. Major Work - The Environmental Contractor will be required to perform Mold Remediation Activities on Large areas or isolated surface removal areas of various building components.
 1. The work area shall be unoccupied.
 2. The County Project Manager will monitor the remediation activities. No work shall proceed until the Inspector has reviewed the preparation of the work area and has given visual to start.

3. Provide controlled access with a minimum one or two stage decontamination unit as specified in the P.O.. Provide a zipper or double flap entrance, demarcation with warning signs and tape. Provide a 6-mil polyethylene sheet to be used as a drop-cloth on the floor at the area of work as required. The drop cloth shall be of sufficient size to prevent debris and overspray to contaminate the floor. A Negative Air Filtration Unit shall be activated immediately adjacent to the work area and maintained in operation during execution of the work. Dust suppression methods, such as misting (not soaking) surfaces prior to remediation, are required.

(a) Construction of Barriers

(1) Care must be taken not to disturb gypsum County or vinyl wall covering of exterior or interior microbially-contaminated walls while isolating work areas, to prevent the release of fungal spores.

(2) Ventilation ductwork and AHU's undergoing insulation removal

work must be isolated from other sections of ventilation ductwork by the use of airtight barriers within the interior cross-sectional area of the ductwork. Isolation barriers shall be a minimum of one layer of 6-mil polyethylene sheeting or equivalent barrier system.

(3) Workers shall wear PPE with respirators when installing isolation barriers if microbially contaminated surfaces (microbially contaminated perimeter walls, water-damaged ceiling tiles, any surface with visible settled dusts) are likely to be disturbed. Full exhaust shall be in operation if disturbance is likely.

(b) Gypsum Wall Board

(1) Gypsum Board with attached vinyl wall coverings should be taken down intact, leaving the vinyl wall covering attached to the gypsum board, and cutting out both materials as one piece to reduce the amount of spores released during demolition. All gypsum board and drywall screws shall be removed with care without damaging metal studs or metal furring. Note that one entire side of all contaminated partitions may require removal (even if contamination does not extend the full height of the partition) to allow adequate cleaning of wall cavity surfaces.

(2) Workers shall wrap manageable sections of contaminated gypsum in one layer of 6-mil polyethylene sheeting securely taped to form an airtight seal. Debris and small pieces shall be placed in single 6-mil polyethylene bags.

(3) Painted gypsum board shall be removed according to these procedures. When wall board contamination extends through to both surfaces, seal the exterior surface with approved removal encapsulant or with polyethylene sheeting, prior to removal.

(4) Remove and bag all porous insulation found in the contaminated wall cavities, such as fiberglass batt insulation or polystyrene bead County, prior to cleanup of the wall cavity.

(c) Wood: All fungal-contaminated wood, if discovered during demolition, shall be removed and double-wrapped in 6-mil polyethylene at the direction of the Owner.

(d) Carpeting: Carpeting shall be removed, cut, and rolled in manageable sections and wrapped in one layer of 6-mil polyethylene sheeting. The wrapping shall be securely taped and HEPA-vacuumed before it is removed from the containment area.

(e) Contaminated materials that cannot be cleaned should be removed from the building in sealed plastic bags or wrapped poly. The outside of the bags should be cleaned with a damp cloth and a detergent solution or HEPA vacuumed in the decontamination chamber prior to their transport to uncontaminated areas of the building. There are no special requirements for the disposal of moldy materials, but all remediation debris shall be disposed as construction debris in an approved landfill.

- (f) The contaminated area and decontamination room should be HEPA vacuumed and cleaned with a damp cloth and/or mop with a detergent solution and be visibly clean prior to air clearance and the removal of isolation barriers.
- (g) Ceiling Panels regardless of extent of area of contamination, removal of moldy, lay-in ceiling panels shall be performed in accordance with the following procedures: Provide a drop cloth below the area of ceiling tiles to be removed. Drop cloth shall be of sufficient size to contain debris dropping from the ceiling removal area.
- (1) Provide a negative air filtration unit immediately adjacent to the removal area.
 - (2) Visually contaminated or water-stained ceiling panels (tiles) shall be taken down intact and placed immediately in 6-mil polyethylene bags.
 - (3) HEPA vacuum and wet wipe the remaining ceiling suspension grid components from which the panels were removed. Use a detergent solution or approved biocide.
 - (4) Upon completion of removal in one area, pick up drop cloth and dispose in 6-mil. poly bag. HEPA vacuum floor below the drop cloth and mop with detergent solution.
 - (5) Repeat procedures at each ceiling removal area.
 - (6) Wet wipe impervious surfaces with visible mold growth using a detergent solution or approved biocide/fungicide. Work from top to bottom, using each side of rag only once. Discard rag after using both sides.
 - (7) After cleaning, there shall be no visible mold growth on the surfaces.
- (h) When required in the P.O., provide a fungicidal anti-microbial coating designed specifically for treatment of surfaces to retard and/or inhibit growth of mold. White-Foster 40-20 or equal. Clear-Foster 40-51 or equal.

4. Final Inspection Acceptance/Major Work

- (1) After the work area decontamination is complete, request the final acceptance inspection from the County Project Manager . When specified in the P.O., fog the entire work area with a biocide solution and continue negative air in work area for 24 hours. Seal all exterior doors to work areas with 6 mil poly.
- (2) At the Owner's option, Final Air Testing maybe required to establish owner acceptance and project demobilization

END OF SECTION

**SECTION 15890
DUCT WORK**

PART 1 - GENERAL

1.01 RELATED WORK:

- A. The General Provisions of the Contract, including the General and Supplementary Conditions, and all forms and documents of Division O and the Appendices, apply to the work of this section.
- B. Related Work Specified Elsewhere:

1.02 SUMMARY

- A. This section specifies criteria for HVAC Ductwork,. The cutting of access openings in existing ductwork, the installation of new access doors to re-seal said openings, and the installation of flexible insulated ducts to replace existing contaminated flexible ducts shall all comply with the provisions of this section.

1.03 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), latest edition:
 - 1. HVAC Duct Construction Standards (Metal and Flexible).
 - 2. High Velocity Duct Construction Standards.
- B. National Fire Protection Association (NFPA):
 - 1. NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals.
 - 2. NFPA 90A Standard for the Installation of Air-conditioning and Ventilating Systems of Other than Residence Type.
- C. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

1.04 SYSTEM DESCRIPTION

- A. Provide double walled ducts with interior insulation for the first 15 feet from an AHU to provide for sound attenuation.
- B. All ductwork shall be sealed to comply with SMACNA:
 - 1. Seal Class A.
 - 2. Leakage Class 6 for rectangular ducts.
 - 3. Leakage Class 3 for round and oval ducts.
- C. Use of fiberglass or components containing coated or exposed fiberglass within airstreams is prohibited.

PRODUCTS

2.01 MANUFACTURERS

- A. Flexible: Genflex or Flexible Technologies
- B. Ductwork and Fittings:
 - 1. Metalaire.
 - 2. Semco.
 - 3. Spiramatic.
 - 4. United Sheet Metal
- C. Medium Pressure Ductwork Adhesive Sealing Compound:
 - 1. Benjamin Foster #30-02.
 - 2. 3M Hardcast

2.02 MATERIALS

- A. Ductwork and patches shall be fabricated and installed according to the SMACNA Standards, except as shown on drawings or specified.
- B. Ductwork shall have manufacturer's gage stamp intact.

2.03 LOW PRESSURE DUCTWORK

- A. Includes ductwork from low pressure air handlers, exhaust, and outside and return air ductwork. Velocities shall not exceed 1,300 fpm and static pressures not to exceed 2 inches WG.
- B. Provide galvanized steel ductwork and/or duct patches, designed, constructed, installed and tested according SMACNA - "HVAC Duct Construction Standards" and as shown on drawings. Ductwork to have manufacturer's gage stamp. Provide cross-breaking or beading to prevent flexing, but do not reduce gage of metal below that required for flat ductwork sheets.
- C. Provide galvanized steel saddles at points of support.
- D. The following ductwork and plenums shall be insulated, unless noted otherwise.
 - 1. Return air ductwork in non-conditioned spaces, including mechanical rooms and space above ceilings.
 - 2. Return air transfer boots.
 - 3. Return/outside air plenums at air handlers.
- E. Plenums:
 - 1. Galvanized steel with the largest dimension of 30 inches and larger shall be 18 gauge.
 - 2. Plenums shall be constructed, designed, installed, and tested according to SMACNA as specified. Joints shall be angle reinforced pocket type. Provide fully gasketed joints between plenums and filter sections.
 - 3. Provide plenum access doors where indicated on drawings. Doors shall be constructed according to Figure 6-12 of SMACNA - HVAC Duct Construction Standards.

F. Flexible Insulated Ductwork:

1. Lightweight duct, core of corrosion resistant reinforcing wire helix permanently bonded within fabric, insulated with 1-1/2" thick, 3/4 lb. density fiberglass flexible insulation and covered with a vapor barrier of aluminum metalized polyester film laminated to glass mesh, elastomer back coated. Duct shall meet NFPA 90A requirements and be listed as Class 1 Air Duct Material, UL 181.
2. Manufacturers:
 - a. Atco Rubber Products.
 - b. Genflex.
 - c. Thermaflex II.
 - d. Venture Type VTKC.
 - e. Wiremold Co.

G. Ductwork and splitter dampers within the ductwork shall be made of the same material.

H. Turning vanes shall be provided in square elbows and shall be of same material as the ductwork. Turning vanes shall be of airfoil type, double thickness factory fabricated.

I. Filter Sections (Air Handlers): Filter section casing shall be constructed of mill galvanized steel of 18 gauge. Casing shall be sized to house filters indicated on drawings.

2.04 MEDIUM PRESSURE DUCTWORK

A. Includes ductwork from discharge of medium pressure air handlers up to and including flexible ductwork connection to medium pressure variable air volume boxes. Velocities above 2000 fpm and static pressures above 2 inches WG.

B. Provide galvanized steel ductwork, designed, constructed, installed and tested according to latest edition of SMACNA "HVAC Duct Construction Standards" and as shown on drawings. Ductwork shall have manufacturer's gage stamp.

C. Ductwork and Fittings:

1. Round and oval ductwork shall be factory fabricated spiral type. Take offs shall be conical, 90 degrees except where 45 degree conicals are indicated on plans. Ninety degree elbows shall be constructed of not less than 5 sections. Laterals also to be conical. Oval duct reinforcing shall be by exterior stiffener angles on flat surface restrained by rods or angle sections; stiffener spacing to be based on 6 inches WG. Ductwork and fittings shall be the product of 1 manufacturer.

2. Rectangular medium pressure ductwork shall be fabricated and installed per SMACNA "High Velocity Duct Construction Standards." Joints shall be sealed and reinforced, and seams and corners shall be sealed with sealant and angles as required for airtightness. Welded construction shall be as required for pressure classification of each system. Turning vanes shall be factory fabricated double thickness airfoil type.

D. Flexible ducts at variable air volume boxes shall be of high pressure type, 4 feet long (maximum). Core and insulation shall be as specified.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install low and medium velocity ductwork. 90 degree bends shall not be made in medium pressure flexible ducts.
- B. Before systems are tested and balanced, ducts shall be thoroughly cleaned and blown out.
- C. Where interferences arise during construction, make transition or division of ductwork on basis of pressure drop equivalent to original size. Obtain approval from A/E before fabrication.

3.02 INSTALLATION

- A. Install ductwork materials and accessories according to the latest edition of SMACNA Low Velocity Duct Construction Standards as specified. These written specifications shall take precedence in case of conflict.

3.03 LOW PRESSURE DUCTWORK

- A. Seams and joints in ductwork shall be made airtight. Seal duct joints with sealer as specified for field sealing of high pressure ductwork. Make exhaust ducts passing through return air chases airtight.
- B. Flexible ductwork shall be installed in sizes to match diffuser necks. Duct length shall be not less than 5 feet and no longer than 7 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations.

3.04 MEDIUM PRESSURE DUCTWORK

- A. Seal medium pressure ductwork seams, joints, connections, rivets, and screw heads well with an adhesive sealing compound of synthetic rubber type. Adhesive sealer shall be UL listed conforming with NFPA 90A. The entire system shall be airtight.
- B. Sharp metal edges are not allowed to extend into air stream. Air inlet collars on VAV boxes shall conform to and be flush with flexible tubing or other inlet conditions. Duct joints shall be lapped in direction of airflow.
- C. Sealing Duct Joints: Shop procedure for sealing high pressure duct joints is as follows:
 - 1. Before fittings and joints are assembled, apply sealer to rivets, groove seams, and tap off collars on internal side of metal. Pittsburgh lock pocket must be flooded with sealer, and duct assembled.
 - 2. Brush sealer around reinforcing rod washers, corners, rivets, notches, and tap-off collars after ducts are assembled.
 - 3. Coat inside of connecting joint and duct surface with sealers, where possible, sealing on inside of ductwork.
- D. Field procedure for sealing duct joints is as follows:
 - 1. Spread sealer on inside of joints of duct to be assembled. Immediately after joints are assembled, apply sealer around outside of joints.
 - 2. After 24 hours, spread a second coat of sealer over joints and allow to dry for 24 hours before testing.
 - 3. Where joints are not accessible for proper sealing, cut hand holes in duct and seal joints from inside. Take special care to seal all duct corners.
 - 4. When testing ducts for leaks, mark leaks and reseal without pressure in duct and allow to dry for 24 hours.

3.05 DUCTWORK SUPPORTS AND HANGERS

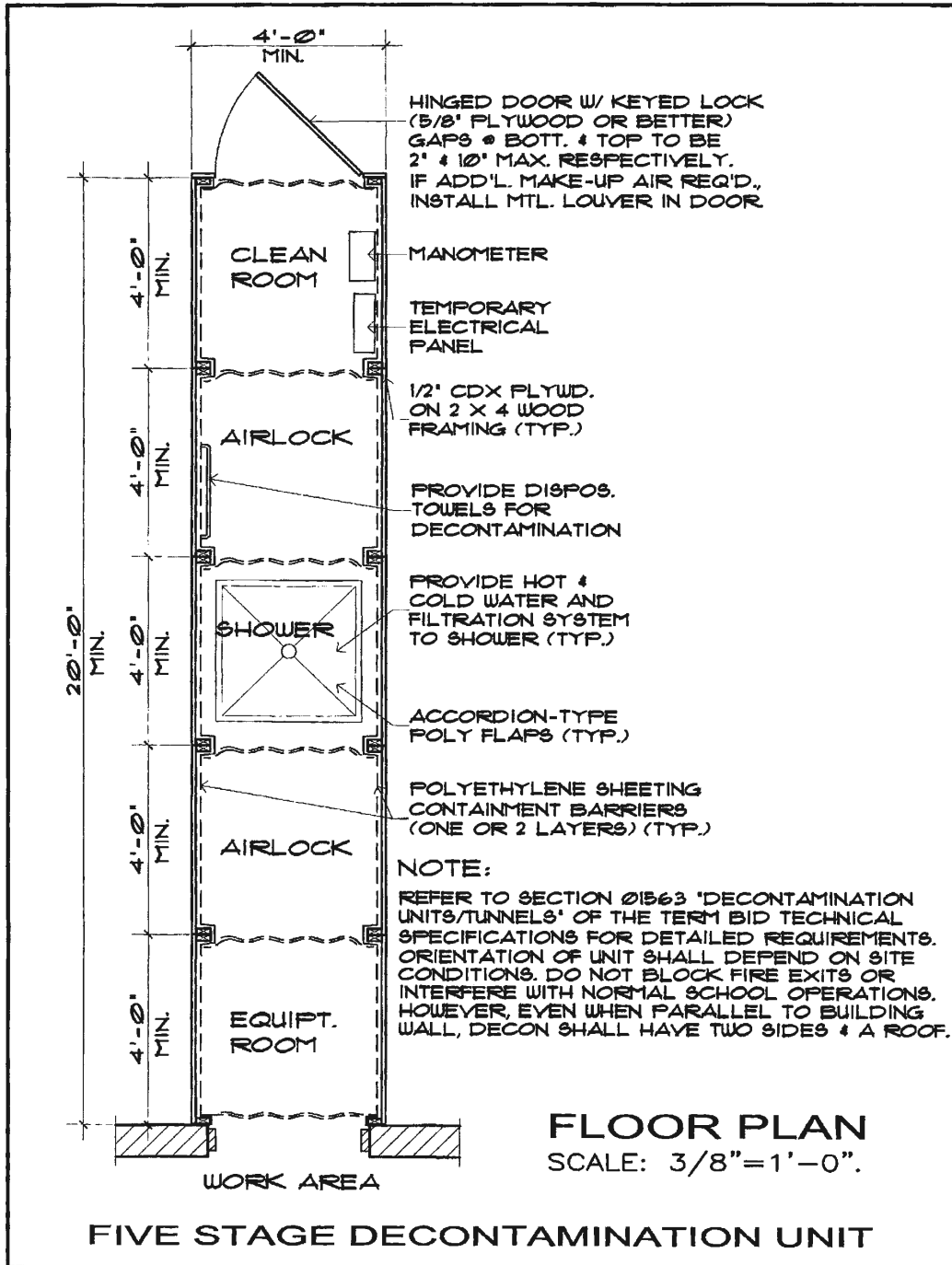
- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.
- B. Hangers shall be galvanized steel hung from inserts or clip angles secured to structure with expansion bolts in shear or tension as follows:
 - 1. Roof Slab: In tension.
 - 2. Structural Beams: In shear, 12 inches minimum from bottom of beam.
 - 3. Joists: Use existing forming bolts openings only. Hangers shall be bent under ductwork at least 2 inches. Hangers for ducts over 48 inches wide shall be secured to bottom and sides of duct.

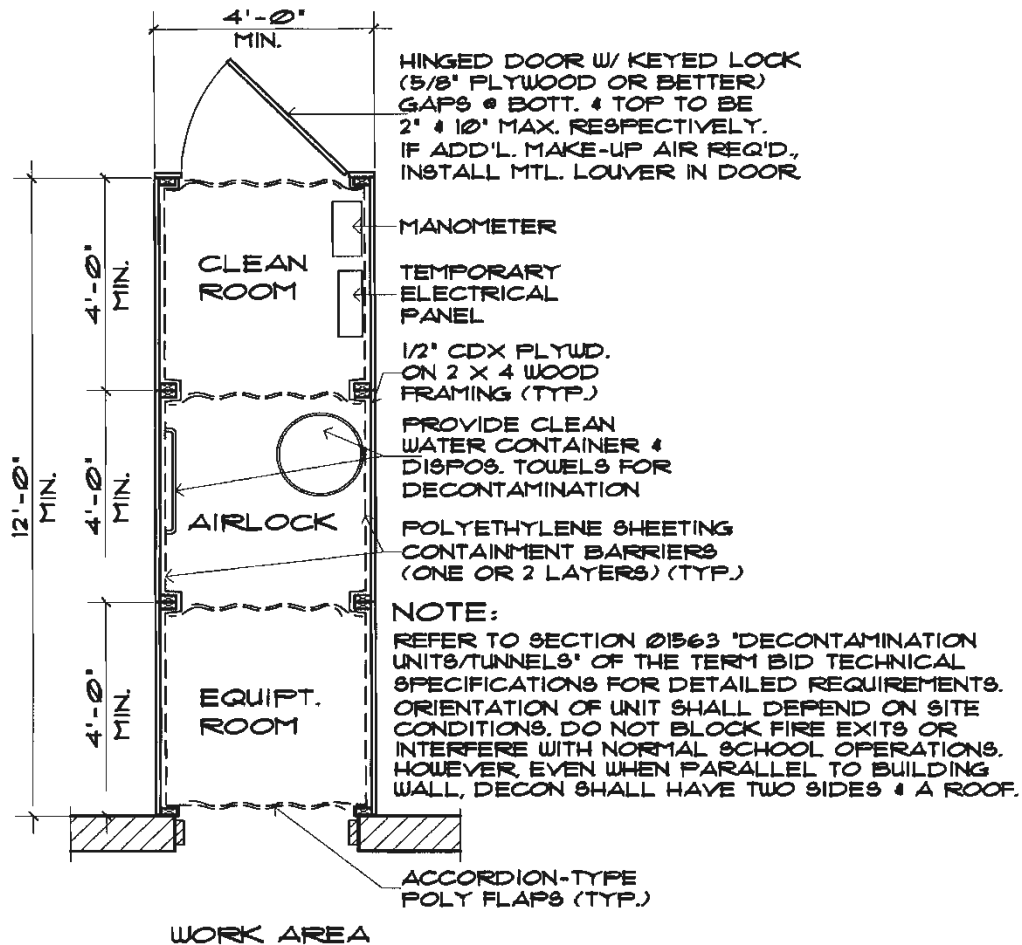
3.06 DUCT PENETRATIONS TO FLOOR AND FIRE WALLS

- A. Joints around duct penetrations shall be packed with fire sating insulation and sealed with fire and smoke barrier caulk as specified in Section 07270, Firestopping and Fire and Smoke Barrier Caulking.

END OF SECTION

**APPENDIX 1 DECONTAMINATION UNITS/RELOCATABLE BUILDING
DRAWINGS & SPECIFICATIONS**

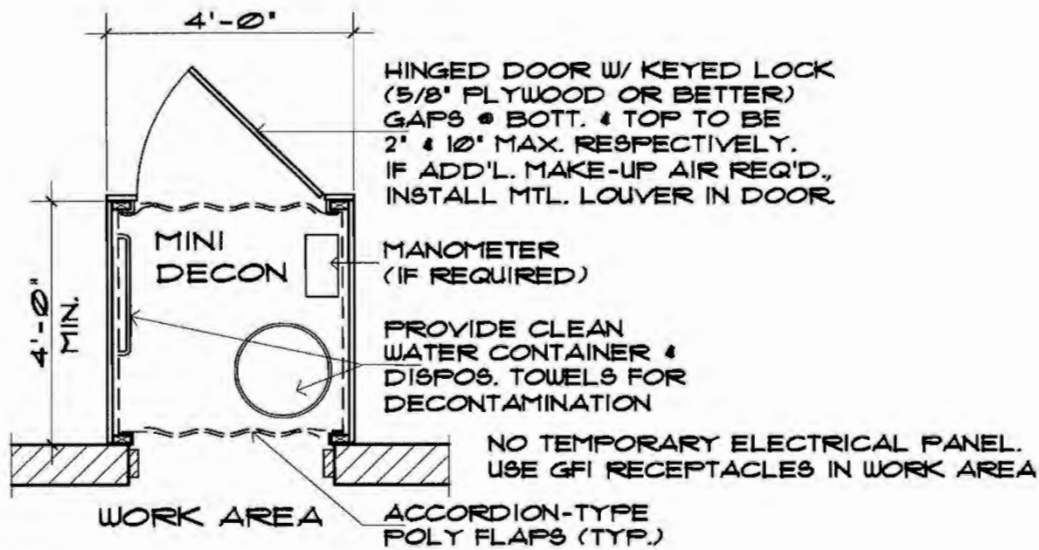




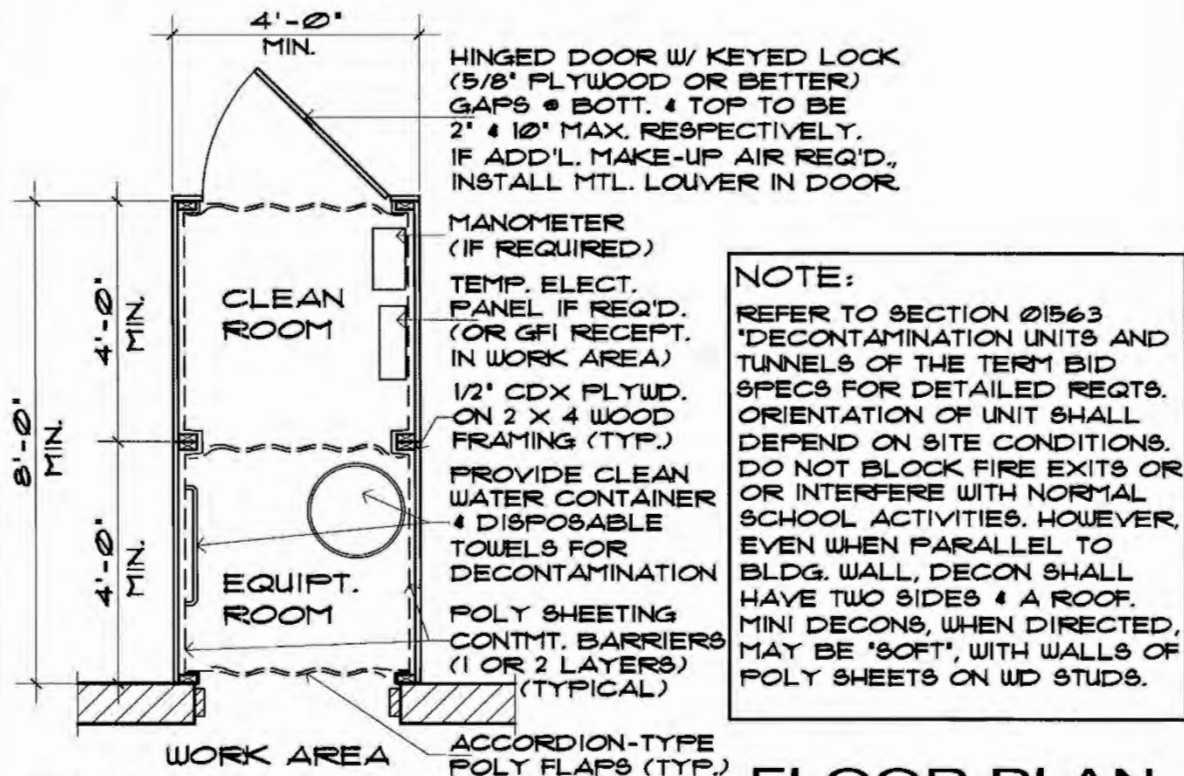
THREE STAGE DECONTAMINATION UNIT

FLOOR PLAN

SCALE: 3/8" = 1'-0".



ONE-STAGE MINI DECONTAMINATION UNIT

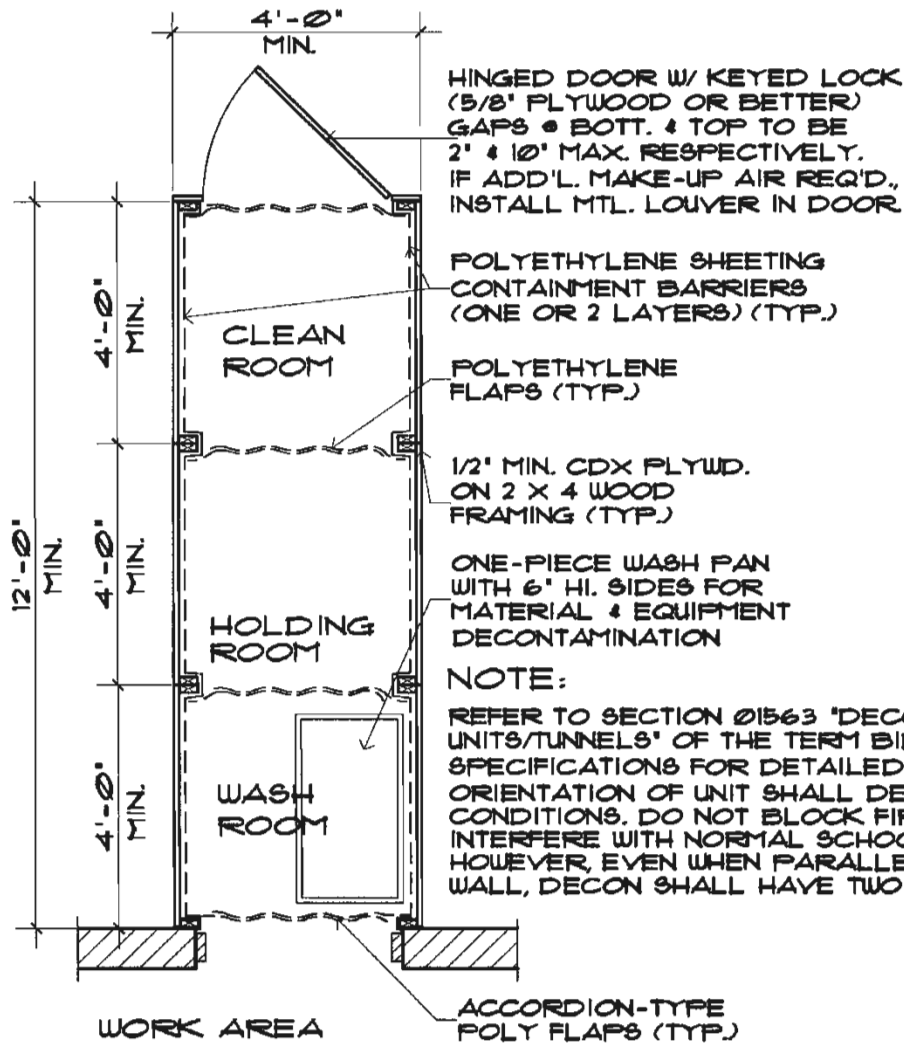


NOTE:

REFER TO SECTION 01563
'DECONTAMINATION UNITS AND
TUNNELS OF THE TERM BID
SPECS FOR DETAILED REQTS.
ORIENTATION OF UNIT SHALL
DEPEND ON SITE CONDITIONS.
DO NOT BLOCK FIRE EXITS OR
OR INTERFERE WITH NORMAL
SCHOOL ACTIVITIES. HOWEVER,
EVEN WHEN PARALLEL TO
BLDG. WALL, DECON SHALL
HAVE TWO SIDES & A ROOF.
MINI DECONS, WHEN DIRECTED,
MAY BE 'SOFT', WITH WALLS OF
POLY SHEETS ON WD STUDS.

TWO-STAGE MINI DECONTAMINATION UNIT

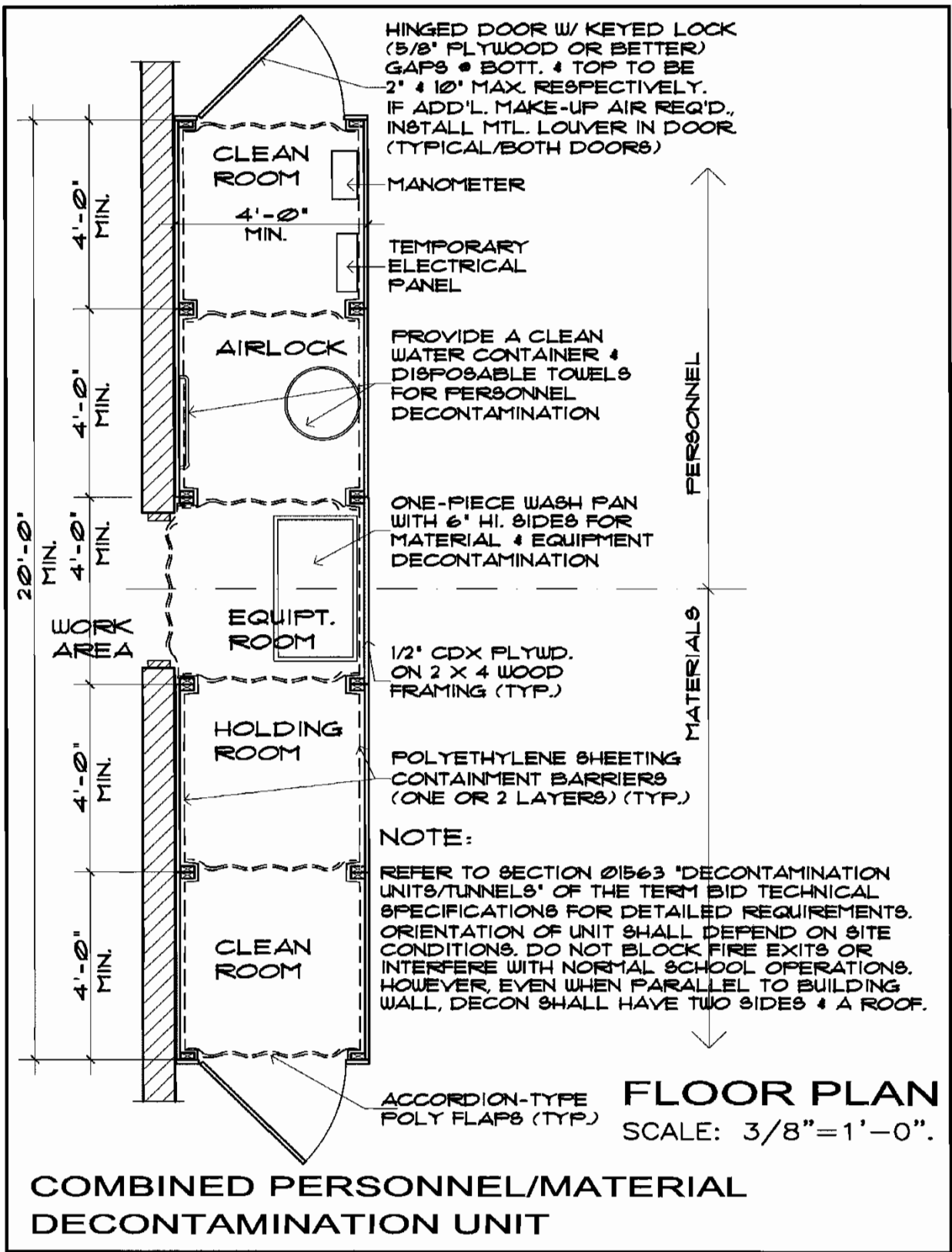
FLOOR PLAN
SCALE: 3/8" = 1'-0".

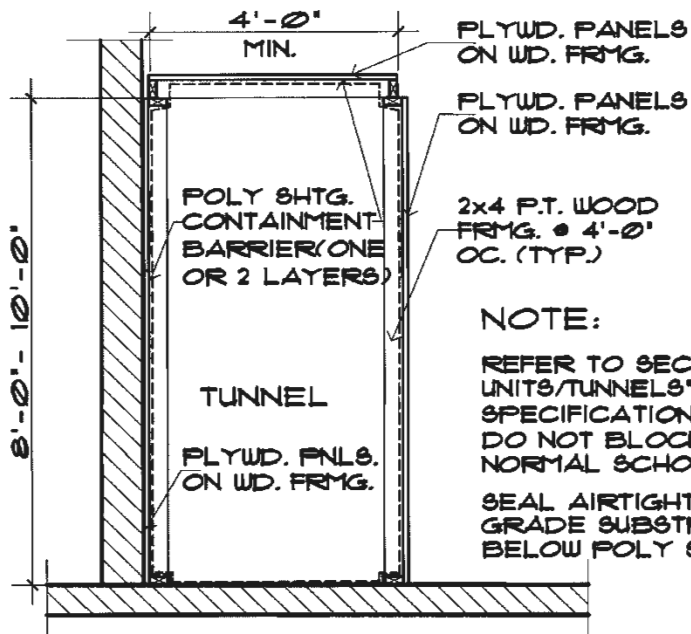


MATERIAL DECONTAMINATION UNIT

FLOOR PLAN

SCALE: 3/8"=1'-0".



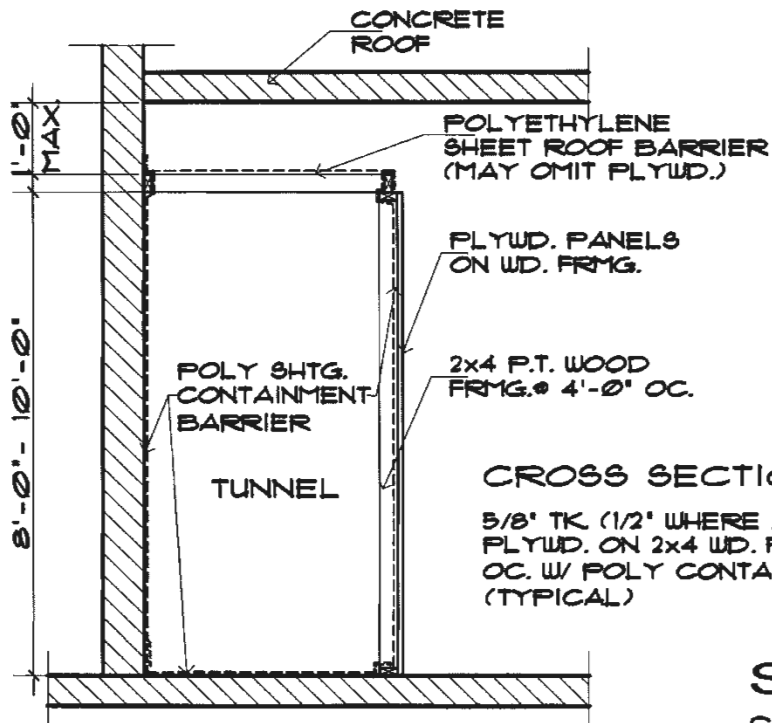


NOTE:

REFER TO SECTION 0563 'DECONTAMINATION UNITS/TUNNELS' OF THE TERM BID TECHNICAL SPECIFICATIONS FOR DETAILED REQUIREMENTS. DO NOT BLOCK FIRE EXITS OR INTERFERE WITH NORMAL SCHOOL OPERATIONS.

SEAL AIRTIGHT W/ POLY & DUCT TAPE. OVER GRADE SUBSTRATE, PROVIDE 5/8" PLYWD. BELOW POLY SHEET BARRIER

FULL TUNNEL-WOOD



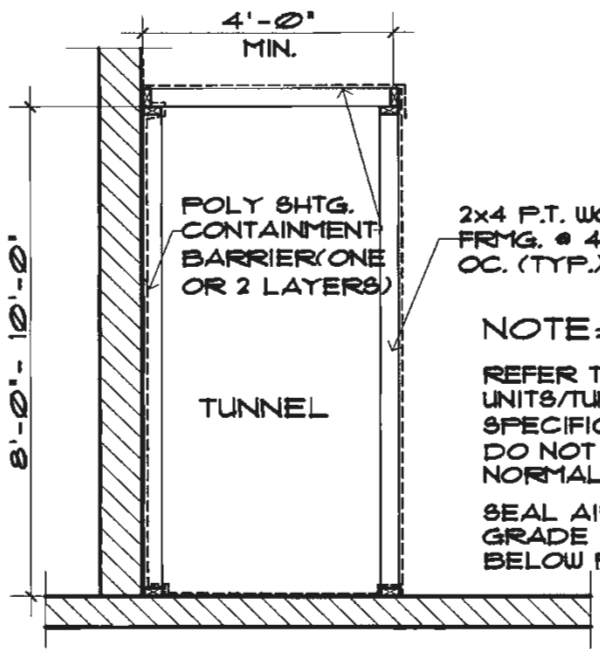
CROSS SECTION/WOOD:

5/8" TK (1/2" WHERE ALLOWED) CDX . PLYWD. ON 2x4 WD. FRAMING @ 4'-0" OC. W/ POLY CONTAINMENT BARRIERS. (TYPICAL)

PARTIAL TUNNEL-WOOD

SECTIONS

SCALE: 3/8" = 1'-0"



FULL TUNNEL-SOFT

2x4 P.T. WOOD FRMG. @ 4'-0" OC. (TYP.)

POLY SHTG. CONTAINMENT BARRIER (ONE OR 2 LAYERS)

TUNNEL

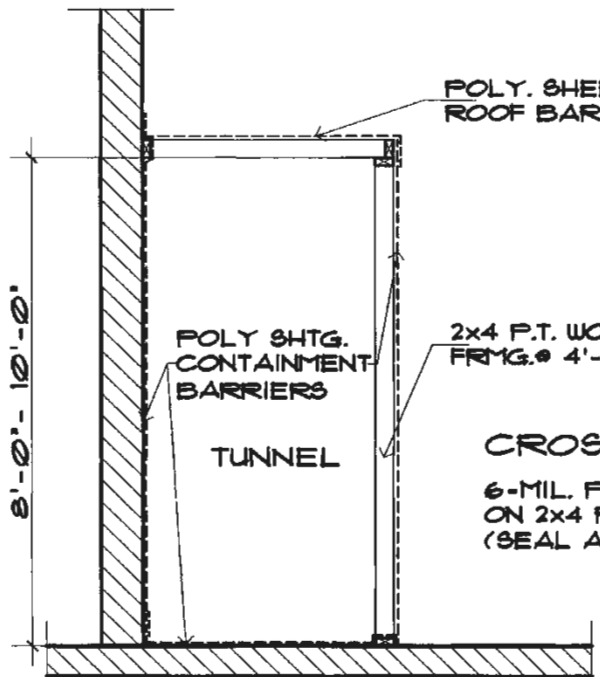
8'-0" - 10'-0"

4'-0" MIN.

NOTE:

REFER TO SECTION 01563 'DECONTAMINATION UNITS/TUNNELS' OF THE TERM BID TECHNICAL SPECIFICATIONS FOR DETAILED REQUIREMENTS. DO NOT BLOCK FIRE EXITS OR INTERFERE WITH NORMAL SCHOOL OPERATIONS.

SEAL AIRTIGHT W/ POLY & DUCT TAPE. OVER GRADE SUBSTRATE, PROVIDE 5/8" PLYWD. BELOW POLY SHEET BARRIER.



PARTIAL TUNNEL-SOFT

POLY. SHEETING ROOF BARRIER

POLY SHTG. CONTAINMENT BARRIERS

TUNNEL

8'-0" - 10'-0"

2x4 P.T. WOOD FRMG. @ 4'-0" OC.

CROSS SECTION/SOFT:

6-MIL. POLY SHEETING (1 OR 2 LAYERS) ON 2x4 P.T. WD. FRAMING @ 4'-0" OC. (SEAL AIR-TIGHT) (TYPICAL)

SECTIONS

SCALE: 3/8" = 1'-0".

