THIS COPY IS FOR INFORMATION ONLY. YOU MUST REQUEST THE PROPOSAL FROM THE DEPARTMENT IN ORDER TO SUBMIT A BID.

MASTER SPECIFICATION FOR ASBESTOS ABATEMENT/DECONTAMINATION FOR DELAWARE DEPARTMENT OF TRANSPORTATION PROPERTIES AGREEMENT 1542

RECEIVED
MAR 04 2011
FACILITIES MANAGEMENT

Prepared For:

Delaware Department of Transportation
800 Bay Road
Dover, Delaware
Attention: Mr. Danny Skeans

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Submitted By:

BrightFields, Inc.
Environmental Services

801 Industrial Street, Suite 1
Wilmington, Delaware 19801
(302) 656-9600

March 1, 2011

APPROVED
Facilities Management
Terri S. McCall
Terri McCall
Date: 3-4-2011

Prepared By:

Monty W. Krough, Sr.

Monty W. Krough, Sr.
AHERA Certified Project Designer No. 016725

BRIGHTFIELDS FILE: 2680.01.74

BrightFields, Inc.

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Master Specifications for
Asbestos Abatement/Decontamination
Delaware Department of Transportation
Agreement 1542

BrightFields, Inc.

Part I.
Commercial Specifications

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I.1
Office of Management and Budget
Division of Facilities Management
Specification Approval

BrightFields, Inc.
Environmental Services

In accordance with Delaware Code, Title 16, Chapter 78, Paragraph 7805 (1), the State of Delaware, Facilities Management has reviewed this Specification and approves its use for the following project:

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Master Specification for Asbestos/Decontamination for Delaware Department of Transportation Properties

Agreement 1542

Signature: Terri S. McCall Date: 3-4-2011

Print Name: TERRI S. McCALL

I.2
Professional Engineer
Specification Approval

BrightFields, Inc.
Environmental Services

To the best of my knowledge, the attached document:

Master Specification for Asbestos/Decontamination for Delaware Department of Transportation Properties

Agreement 1542

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has been prepared in accordance with standard industry practices and all applicable state, local, and federal codes and environmental regulations. Prior to the performance of any work, a site/project specific Division 1, Section 01013 will be prepared and submitted for review and approval as an addendum of this Master Specification.

It is ultimately the responsibility of the Abatement Contractor to inspect all existing conditions prior to the execution of the contract and also to comply with all applicable state, local, and federal codes and environmental regulations during all aspects of the abatement project.

Lee R. dePersia

Delaware P.E. # 14541

Date: 1 March 2011

I.3
BrightFields, Inc.
Personnel and Business Certifications

Certificate of Completion

Monty W. Krough, Sr.

for successfully completing the prescribed course of study in

Pennsylvania Asbestos Building Inspector Refresher Course

under TSCA Title II

presented by

ACCESS TRAINING SERVICES, INC.
7925 River Road,Pennsauken, NJ 08109
(856) 665-3449

8/12/10	N/A	8/12/11
Course Date	*Exam Date*	*Expiration Date*
Not Provided	**ACC-0810-6-006**	*Mark K. Schläger*
Social Security Number	*Certificate Number*	*Training Director*

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Certificate of Completion

awarded to

Monty W. Krough, Sr.

for successfully completing the prescribed course of study in

Pennsylvania Asbestos Management Planner Refresher Course

under TSCA Title II

presented by

ACCESS TRAINING SERVICES, INC.
7925 River Road, Pennsauken, NJ 08110
(856) 665-3449

8/12/10	N/A	8/12/11
Course Date	*Exam Date*	*Expiration Date*
Not Provided	**ACC-0810-8-004**	*Mark K. Schläger*
Social Security Number	*Certificate Number*	*Training Director*

Certificate of Completion

awarded to

Monty W. Krough, Sr.

for successfully completing the prescribed course of study in

Pennsylvania Asbestos Project Designer Refresher Course

under TSCA Title II

presented by

ACCESS TRAINING SERVICES, INC
7925 River Road, Pennsauken NJ 08110

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8/13/10	N/A	8/13/11
Course Date	*Exam Date*	*Expiration Date*
N/A	ACC-0810-10-002	*Mark K. Schläger*
Social Security Number	*Certificate Number*	*Training Director*

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JASON W. SUNDE

has successfully completed DELAWARE APPROVED

PROJECT MONITOR - REFRESHER COURSE

COURSE LENGTH - 1 DAY, 8 HOURS

on March 30th, Two Thousand-Ten

DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 033010

EXPIRE DATE: 033011

ID NUMBER C100330-PM-602

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JASON W. SUNDE

has successfully completed EPA APPROVED

AHERA BUILDING INSPECTOR REFRESHER TRAINING

COURSE LENGTH 4 HOURS

on April 20th, Two Thousand-Ten

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RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042010

EXPIRE DATE: 042011

ID NUMBER CB100420-0125

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JASON W. SUNDE

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AHERA MANAGEMENT PLANNER REFRESHER TRAINING

COURSE LENGTH 4 HOURS

April 20, Two Thousand-Ten

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RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042010 EXPIRE DATE: 042011 ID NUMBER CMP100420-0035

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JASON W. SUNDE

has successfully completed

AHERA PROJECT DESIGN - REFRESHER COURSE

COURSE LENGTH - 1 DAY, 8 HOURS

on April 23rd, Two Thousand-Ten

DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042310 EXPIRE DATE: 042311 ID NUMBER CPD100423-104

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CENTRAL DELAWARE TRAINING ACADEMY, INC.

JOHN-PAUL ROSSI

has successfully completed DELAWARE APPROVED

PROJECT MONITOR - REFRESHER COURSE

COURSE LENGTH - 1 DAY, 8 HOURS

on March 30th, Two Thousand-Ten

DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 033010

EXPIRE DATE: 033011

ID NUMBER C100330-PM-642

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JOHN-PAUL ROSSI

has successfully completed EPA APPROVED

AHERA BUILDING INSPECTOR REFRESHER TRAINING

COURSE LENGTH 4 HOURS

on April 20th, Two Thousand-Ten

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DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042010 EXPIRE DATE: 042011 ID NUMBER CB100420-0204

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JOHN-PAUL ROSSI

has successfully completed EPA APPROVED

AHERA MANAGEMENT PLANNER REFRESHER TRAINING

COURSE LENGTH 4 HOURS

April 20, Two Thousand-Ten

DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042010 EXPIRE DATE: 042011 ID NUMBER CMP100420-0033

CENTRAL DELAWARE TRAINING ACADEMY, INC.

JOHN-PAUL ROSSI

has successfully completed

AHERA PROJECT DESIGN - REFRESHER COURSE

COURSE LENGTH - 1 DAY, 8 HOURS

on April 23rd, Two Thousand-Ten

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DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042310 EXPIRE DATE: 042311 ID NUMBER CPD100423-103

CENTRAL DELAWARE TRAINING ACADEMY, INC.

SEAN A. SCANLON

has successfully completed DELAWARE APPROVED

PROJECT MONITOR - REFRESHER COURSE

COURSE LENGTH - 1 DAY, 8 HOURS

on November 16th, Two Thousand-Ten

DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 111610

EXPIRE DATE: 111611

ID NUMBER C101116-PM-674

CENTRAL DELAWARE TRAINING ACADEMY, INC.

SEAN A. SCANLON

has successfully completed EPA APPROVED

AHERA BUILDING INSPECTOR REFRESHER TRAINING

COURSE LENGTH 4 HOURS

on April 20th, Two Thousand-Ten

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DAVID T. STANLEY, PRESIDENT

RONALD S. HERCHA, VICE PRESIDENT

CDTA
P.O. BOX 1344
DOVER, DE 19903-1344
(302) 677-1534

EXAM DATE: 042010

EXPIRE DATE: 042011

ID NUMBER CB100420-0201

STATE OF DELAWARE

THIS CERTIFIES THAT

Brightfields, Incorporated

Has satisfactorily completed the requirements prescribed by the Office of Management & Budget as a Asbestos Abatement Professional Service Firm this

Twenty-Fourth Day of January Two Thousand Eleven

This certification is valid for one (1) year to perform asbestos services within the State of Delaware.

This certification shall be proof that the above named Contractor has met the minimum requirements established by the State of Delaware for temporary certification. It is not intended as an overall endorsement of the Contractor's ability to provide services of varying size and shape. It does not endorse the methods and types of respiratory protection used by the Contractor.

Contractor's Address: 801 Industrial Street
Suite #1
Wilmington, DE 19801

Expiration Date: January 24, 2012

Certification Number: PS-125

Director
Division of Facilities Management

LICENSE NO. 2003105325 DORBL

POST CONSPICUOUSLY

STATE OF DELAWARE
DIVISION OF REVENUE

VALID
01/01/11 - 12/31/13
NOT TRANSFERABLE

DLN: 10 83450 55

BUSINESS CODE 540
GROUP CODE 007

LICENSED ACTIVITY
PROFESSIONAL SERVICES- ENGINEER
PROFESSIONAL AND/OR PERSONAL SERVICES

DATE ISSUED: 12/21/10

VALIDATED

2013

LICENSE FEE: $ 225.00

BUSINESS LICENSE

MAILING ADDRESS

#BWNKHPS
#193Y 7UT0 1LM1 XM27#
BRIGHTFIELDS INC
801 INDUSTRIAL ST STE 1
WILMINGTON DE 19801-4368

BUSINESS LOCATION

BRIGHTFIELDS INC
801 INDUSTRIAL ST STE 1
WILMINGTON DE 19801-4368

IS HEREBY LICENSED TO PRACTICE, CONDUCT OR ENGAGE IN THE OCCUPATION OR BUSINESS ACTIVITY INDICATED ABOVE IN ACCORDANCE WITH THE LICENSE APPLICATION DULY FILED PURSUANT TO TITLE 30, DEL CODE.

PATRICK T. CARTER
DIRECTOR OF REVENUE

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I.4
The State of Delaware
Department of Transportation
Standard Specifications August 2001
(Cover and Table of Contents only)

Standard Specifications

Specifications for
Road and Bridge Construction

August 2001

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Prepared by
The Delaware Department of Transportation

Nathan Hayward III, Secretary
Raymond M. Harbeson, Jr., Chief Engineer

For sale by the Delaware Department of Transportation
PO Box 778, Dover, Delaware 19903 (Attn.: Contract Administration)

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Part II.
Technical Specifications

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Division 1
General Requirements

BrightFields, Inc.

01013
Summary of Work – Asbestos Abatement

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BrightFields, Inc.

A Site Specific Division 1, Section 01013
will be prepared, as appropriate, for each project

BrightFields, Inc.
Environmental Services

SECTION 01013 - SUMMARY OF THE WORK - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. State Project No. T2004-122-01…Kent County
Federal Project No. F.A.P. NH-K008(5)
SR-1, Thompsonville Grade Separated Intersection.
Former Owner: Wilson A. and Brenda J. Stanton
Parcel No. K-272
112 Thompsonville Road
Milford, Delaware
Task No. 51 – Asbestos Management

1. Project Location: 112 Thompsonville Road, Milford, Delaware

2. Owner: Delaware Department of Transportation

B. **Contract Documents**:

Prepared for the project by BrightFields, Inc.
801 Industrial Street,
Wilmington, DE 19801

Conditions that are indicated on the Contract Documents include but are not limited to the following:

1. Specification

2. Specification Addenda

Notices & Permits:

1. Job Site Notices & Permits:

a. Equal Employment Opportunity
b. Material Safety Data Sheets
c. Federal EPA 10-day Notification; if required
d. State of Delaware (DNREC) 10-day Notification; if required
e. Prevailing Wage Determination

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f. Emergency Planning Procedures
g. Sub-Contractors List

Work to be performed subsequent to work under this contract: Although Del DOT properties are subject for demolition, only ACM materials or ACM contaminated materials are to leave the site.

All other building materials will be inventoried to ensure that nothing else leaves the site. Water and electricity shall not be available for abatement activities onsite and must be provided by the contractor for all removal activities. Contractor will also be responsible for following all OSHA guidelines for the duration of the project.

C. **The Work** consists of the proper removal of the following asbestos-containing materials:

Main Residential Structure:

1. 9" x 9" floor tile (brown), as flooring in the kitchen under sheet goods – estimated 196 square feet – (8% Chrysotile).
2. Furnace insulation (brown) associated with furnace in dirt crawlspace – estimated 64 square feet – (60% Chrysotile). Please note that the furnace will have to be removed hole since there is no way to critical the area.

Detached Trailer:

1. 9" x 9" Floor tile (light blue) throughout the trailer as original flooring – 304 square feet – (8% Chrysotile).
2. 12" x 12" Floor tile (red) in kitchen area of trailer on top of asbestos-containing 9" x 9" floor tile – 64 square feet – (5% Chrysotile).
3. Door/Window caulk (black) associated with doors and windows of the trailer – estimated 16 units – (5%).
4. Roof coat (silver) associated with the roof of the detached trailer (silver) – 304 square feet – (3% Chrysotile).
5. Roof flashing (black) associated with the roof of the detached trailer under the silver roof coat – 304 square feet – (5% Chrysotile).

D. **The Work** will be constructed under a single prime contract.

1. **Removal Procedures (Main Residential Structure):**

Removal of interior asbestos-containing materials (9" x 9" floor tile):

i. Please note: Abatement activities cannot begin or be completed without the owner's licensed Project Monitor present.

ii. Install a 3-stage decontamination unit with shower at the entrance to the work area/containment. The decontamination unit will be erected in such a manner as to allow

for a separate equipment room/bag-out. In no instance will the personal decontamination unit be used as a bag-out/equipment passage.

iii. Install and run HEPA filtered air filtration devices. Pre-clean any areas needing critical barriers and install critical barriers. Please note this work will be completed under one containment, which will require that all criticals be sealed for the entire area. Please refer to Figure 1 for exact location of work area.

iv. Establish and maintain a pressure differential of -0.02 inches of water measured on a strip chart recorder or other approved method. The owners' representative shall inspect and record the pressure differential at least 2 times per 8-hour shift. The contractor shall supply a pressure differential manometer that is capable of monitoring and recording on a strip chart, pressure differential of 0.005 inches of water. The manometer shall be equipped with an automatically activated alarm system that will sound if the pressure differential drops below the pre-set value. All strip charts will be turned in to the owners' representative at the completion of the project phase. Work shall not commence until an adequate pressure differential is achieved and maintained.

v. A pre-commencement inspection shall be conducted by the abatement contractor's supervisor and the owner's representative; when approval from the owner's representative is received the abatement activities may commence. The asbestos-containing materials shall be adequately wetted with amended water during the abatement process. Dry removal of any asbestos-containing materials will not be tolerated. The asbestos-containing building materials shall be continuously wetted and immediately placed into 6 ml. asbestos disposal bags for proper disposal, according to section 02081 of the Master Specification.

vi. Remove by mechanical method (hand scraper) all asbestos-containing floor tile and resulting debris. All asbestos-containing floor tile are to be properly containerized, labeled and removed from the work area to the waste trailer. Clean entire area using an approved vacuum equipped with HEPA filter.

vii. After this procedure is completed and a visual inspection has passed, final clearance sampling will be performed by the owner's representative. Final Clearance shall be conducted by PCM analysis using EPA approved protocol.

viii. HEPA filtered air filtration devices shall remain in use until final analytical clearance has been established.

Removal of exterior asbestos-containing materials (Furnace insulation):

i. Please note: Abatement activities cannot begin or be completed without the owner's licensed Project Monitor present.

ii. Install a 3-stage remote decontamination unit with shower adjacent to the work area. Please refer to Figures 2 for exact locations of work area.

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iii. An established hot zone will be established using asbestos danger tape (red in color).

iv. Once an approval to commence is received from the owners' representative, the furnace will wrapped with two layers of 6 mill polyethylene sheeting. Once furnace has been completely wrapped, it will be removed from work area and disposed of properly.

v. A thorough final visual inspection will be performed to evaluate if the area has been sufficiently cleaned of ACM and all visible debris.

vi. During the abatement activities the owner's representative will be collecting PCM air samples, one up wind and one down wind, to evaluate if the contractor is removing the asbestos-containing materials in a non-friable fashion.

2. **Removal Procedures (Detached Trailer):**

Removal of interior asbestos-containing materials (Floor Tile):

i. Please note: Abatement activities cannot begin or be completed without the owner's licensed Project Monitor present.

ii. Install a 3-stage decontamination unit with shower at the entrance to the work area/containment. The decontamination unit will be erected in such a manner as to allow for a separate equipment room/bag-out. In no instance will the personal decontamination unit be used as a bag-out/equipment passage.

iii. Install and run HEPA filtered air filtration devices. Pre-clean any areas needing critical barriers and install critical barriers. Please note this work will be completed under one containment, which will require that all criticals be sealed for the entire area. Please refer to Figure 3 for exact location of work area.

iv. Establish and maintain a pressure differential of -0.02 inches of water measured on a strip chart recorder or other approved method. The owners' representative shall inspect and record the pressure differential at least 2 times per 8-hour shift. The contractor shall supply a pressure differential manometer that is capable of monitoring and recording on a strip chart, pressure differential of 0.005 inches of water. The manometer shall be equipped with an automatically activated alarm system that will sound if the pressure differential drops below the pre-set value. All strip charts will be turned in to the owners' representative at the completion of the project phase. Work shall not commence until an adequate pressure differential is achieved and maintained.

v. A pre-commencement inspection shall be conducted by the abatement contractor's supervisor and the owner's representative; when approval from the owner's representative is received the abatement activities may commence. The asbestos-containing materials shall be adequately wetted with amended water during the abatement process. Dry removal of any asbestos-containing materials will not be

tolerated. The asbestos-containing building materials shall be continuously wetted and immediately placed into 6 ml. asbestos disposal bags for proper disposal, according to section 02081 of the Master Specification.

vi. Remove by mechanical method (hand scraper) all asbestos-containing floor tile and resulting debris. All asbestos-containing floor tile are to be properly containerized, labeled and removed from the work area to the waste trailer. Clean entire area using an approved vacuum equipped with HEPA filter.

vii. After this procedure is completed and a visual inspection has passed, final clearance sampling will be performed by the owner's representative. Final Clearance shall be conducted by PCM analysis using EPA approved protocol.

viii. HEPA filtered air filtration devices shall remain in use until final analytical clearance has been established.

Removal of exterior asbestos-containing materials (Door/Window caulk, silver roof coat, and roof flashing):

i. Please note: Abatement activities cannot begin or be completed without the owner's licensed Project Monitor present.

ii. Install a 3-stage remote decontamination unit with shower adjacent to the work area. Please refer to Figures 3 and 4 for exact locations of work areas.

iii. An established hot zone will be established using asbestos danger tape (red in color).

iv. Once an approval to commence is received from the owners' representative, the door/window caulk, silver roof coat, and roof flashing will be removed using techniques that will prevent the asbestos-containing materials from becoming friable. Amended water will be used for the duration of the abatement activities.

v. A thorough final visual inspection will be performed to evaluate if the area has been sufficiently cleaned of ACM and all visible debris.

vi. During the abatement activities the owner's representative will be collecting PCM air samples, one up wind and one down wind, to evaluate if the contractor is removing the asbestos-containing materials in a non-friable fashion.

3. **The following inspections shall be performed during the project phases indicated:**

a. Pre-Cleaning: A visual inspection of all pre-cleaned surfaces must be performed by the contractors' on-site supervisor and the owners' representative together prior to any abatement activities.

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b. Daily Project Inspections: An inspection of the integrity of the work area shall be performed a minimum of twice daily by the owners representative.

c. Final Visual Inspection (air clearance): A final visual inspection of the work area shall be performed by the contractors' on-site supervisor and owners' representative prior to aggressive final air clearance sampling.

d. Project Completion Inspection (post air clearance): A final visual inspection of the work area shall be performed by the contractors' on-site supervisor and owners' representative after aggressive final air clearance sampling has passed and containment system has been demobilized, prior to turning the area (s) over to the owner.

Minimum Respiratory protection for this project shall include **full face Powered Air Purifying Respirators (PAPR)** for set up and removal of the asbestos-containing materials.

As previously mentioned, electric and water shall not be available onsite and/ or provided by the owner. The contractor will have to provide temporary electric and water sources for the duration of the project.

All existing electric power in the work area shall be confirmed de-energized (when applicable) by the abatement contractor and temporary power shall be brought to the work area from outside - section 01503 of the Specification. The owner shall not supply temporary utilities. It is the contractors' responsibility to comply with all OSHA requirements.

All workers must have their current State of Delaware Asbestos Worker/Supervisor Badge and current medical information available daily for verification and recording purposes by the owners' representative in order to work on the project. NO EXCEPTIONS SHALL BE TOLERATED.

The abatement contractor shall supply extra, new respirators (PAPR), respirator cartridges, disposable coveralls (w/head and foot covers) at the decontamination unit for use by authorized visitors as well as the owners' representative at all times. All decontamination procedures shall be strictly followed and enforced. A signed copy of the Workers' Acknowledgment shall be obtained from each worker - section 01301 of the Specification.

Measurements provided in this section are approximate and it is understood that ALL measurements must be verified by the contractor and reported to the owners' representative.

4. All work shall be performed in accordance with the requirements of the specification and all applicable federal, state and local regulations. The contractor should take special note to the following sections of the specification:

5. Related Specifications

a. Division 1 - General Requirements:

01028 Application for Payment - Asbestos Abatement
01043 Project Coordination - Asbestos Abatement
01097 Reference Standards and Definitions - Asbestos Abatement
01098 Codes, Regulations and Standards - Asbestos Abatement
01301 Submittals - Asbestos Abatement
01310 Schedule
01503 Construction Facilities and Temporary Controls - Asbestos Abatement
01513 Temporary Pressure Differential & Air Circulation System
01526 Temporary Enclosures
01527 Regulated Areas
01528 Entry into Controlled Areas
01529 Mini Enclosures and Glove bags
01560 Worker Protection - Asbestos Abatement
01562 Respiratory Protection
01563 Decontamination Units
01601 Materials and Equipment - Asbestos Abatement
01632 Product Substitutions - Asbestos Abatement
01701 Contract Closeout - Asbestos Abatement
01711 Project Decontamination
01712 Cleaning and Decontamination Procedures

b. Division 2 - Site Work

02061 Building Component Demolition - Asbestos Abatement
02062 Non-Asbestos Demolition
02063 Removal of Asbestos Contaminated Materials
02081 Removal of Asbestos Containing Material
02084 Disposal of Regulated Asbestos Containing Material
02085 Resilient Floor Covering Manufacturers' Recommended Work Practices
02086 Hazardous Waste Management
02087 Resilient Flooring Removal - Aggressive Asbestos Abatement
02088 Removal of Asbestos Roofing Materials

c. Division 9 – Finishes

09805 Encapsulation of Asbestos-Containing Materials

6. Submittals: Prior to starting work, submit the following to the owners' representative for review. Do not begin without the approval of the owners' representative.

a. Scope of Work - Submit a detailed plan of the procedures to be used in complying with the requirements of this specification. Include the location and layout of decontamination unit(s), the sequencing of work, the interfacing of other trades, methods to be used to assure the safety of the building occupants and visitors, detailed disposal plan and a detailed description of the methods to be used to control pollution.

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The plan shall be submitted at the pre-work meeting and approved by the owners' representative prior to starting work.

7. Inspection: Prior to starting work, inspect work areas. Prepare a list of damages to the structure, surfaces and equipment of surrounding areas of the building that may be construed as damage caused by the work. Photograph or videotape existing conditions as necessary to document these conditions. Submit to the owners' representative prior to starting work.

1.3 WORK SEQUENCE

A. **The Work** will be conducted in one phase:

Main Residential Structure:

3. 9" x 9" floor tile (brown), as flooring in the kitchen under sheet goods – estimated 196 square feet – (8% Chrysotile).
4. Furnace insulation (brown) associated with furnace in dirt crawlspace – estimated 64 square feet – (60% Chrysotile). Please note that the furnace will have to be removed hole since there is no way to critical the area.

Detached Trailer:

6. 9" x 9" Floor tile (light blue) throughout the trailer as original flooring – 304 square feet – (8% Chrysotile).
7. 12" x 12" Floor tile (red) in kitchen area of trailer on top of asbestos-containing 9" x 9" floor tile – 64 square feet – (5% Chrysotile).
8. Door/Window caulk (black) associated with doors and windows of the trailer – estimated 16 units – (5%).
9. Roof coat (silver) associated with the roof of the detached trailer (silver) – 304 square feet – (3% Chrysotile).
10. Roof flashing (black) associated with the roof of the detached trailer under the silver roof coat – 304 square feet – (5% Chrysotile).

1.4 ASBESTOS-CONTAINING MATERIALS:

A. **The work** of this contract involves activities that will disturb asbestos-containing materials (asbestos-containing materials). The location and type of asbestos-containing materials known to be present at the worksite is set forth in the "Schedule of Asbestos-Containing Materials" at the end of this section. If any other asbestos-containing materials or suspect asbestos-containing materials are found, notify the owner, other employers and employees about the location and quantity of the asbestos-containing materials or suspect asbestos-containing materials within 24 hours of the discovery.

The following asbestos-containing materials are known to be present at the worksite. If any other materials are

found that are suspected of containing asbestos, notify the owners' representative immediately.

Main Residential Structure:

5. 9" x 9" floor tile (brown), as flooring in the kitchen under sheet goods – estimated 196 square feet – (8% Chrysotile).
6. Furnace insulation (brown) associated with furnace in dirt crawlspace – estimated 64 square feet – (60% Chrysotile). Please note that the furnace will have to be removed hole since there is no way to critical the area.

Detached Trailer:

11. 9" x 9" Floor tile (light blue) throughout the trailer as original flooring – 304 square feet – (8% Chrysotile).
12. 12" x 12" Floor tile (red) in kitchen area of trailer on top of asbestos-containing 9" x 9" floor tile – 64 square feet – (5% Chrysotile).
13. Door/Window caulk (black) associated with doors and windows of the trailer – estimated 16 units – (5%).
14. Roof coat (silver) associated with the roof of the detached trailer (silver) – 304 square feet – (3% Chrysotile).
15. Roof flashing (black) associated with the roof of the detached trailer under the silver roof coat – 304 square feet – (5% Chrysotile).

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1.5 ASBESTOS HEALTH RISK:

A. The disturbance or dislocation of asbestos-containing materials may cause asbestos fibers to be released into the atmosphere, thereby creating a potential health risk to workers. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the risk 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 asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the risk of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.

1.6 CONTRACTOR USE OF PREMISES

A. **General:** During the abatement period the Contractor shall have limited use of the premises for abatement operations.

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

1. **Owner Occupancy:** Allow for Owner occupancy and owner's representative.

2. **Driveways and Entrances:** Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

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

1. **Smoking**: Smoking or open fires will not be permitted on the property.

2. **Toilet Rooms:** Use of onsite toilets will not be permitted. It will be the contractors' responsibility to provide temporary sanitary facilities and / or use local offsite public facilities.

1.7 OCCUPANCY REQUIREMENTS

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

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

1.8 AIR MONITORING BY THE OWNER:

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

1. **Outside of the Work Area**: The Owner's air monitoring firm may sample air outside of the work area to detect faults in the work area isolation such as:
   a. Contamination of the building outside of the work area with airborne asbestos fibers,
   b. Failure of filtration or rupture in the differential pressure system,
   c. Contamination of air outside the building envelop with airborne asbestos fibers.

2. **Inside the Work Area**: The Owners' air monitoring firm may monitor airborne fiber counts in the Work Area. The purpose of this air monitoring is to detect airborne asbestos concentrations which may challenge the ability of the Work Area isolation procedures to protect the balance of the building or outside of the building from contamination by airborne fibers.

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

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

1.9 SCHEDULE OF AIR SAMPLES BY OWNER:

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

1. **PCM**: 0.8 micrometer mixed cellulose ester.

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

C. **Sample Volume and Sensitivity:**

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

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

Where:

Number of fibers = 5.5 fibers/100 fields, based on a limit of detection (LOD) of 7 fibers/mm^2 on the filter
Area of 100 fields = 0.785mm^2
Total Filter Area = 385mm^2
Limit Value = as specified in the schedules of samples below

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

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

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

D. **Base Line:**

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

2. **PCM Samples**

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Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume (Liters)	Rate (Liters/ Minute)
Each Work Area	5	0.01	1200	1-10
Outside Each Work Area	5	0.01	1200	1-10
Outside Building	5	0.01	1200	1-10

3. **TEM Samples:**

Location Sampled	Number of Samples	Analytical Sensitivity (Struct. /cc.)	Approx. Volume (Liters)	Rate (Liters/ Minute)
Each Work Area	1	0.005	1,200	1-10
Outside Each Work Area	1	0.005	1,200	1-10
Outside Building	1	0.005	1,200	1-10

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

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

   b. Average of the PCM samples collected outside the building

   c. 0.01 fibers per cubic centimeter

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

E. Daily:

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

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

3. **PCM Samples:**

Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume (Liters)	Rate (LPM)
Each Work Area	2	0.01	1000	1-10
Outside Each Work Area at Critical Barrier	1	0.01	1000	1-10
Clean Room	1	0.01	1000	1-10
Equipment Decon	1	0.01	1000	1-10
Outside Building	1	0.01	1000	1-10
Output of Pressure Differential System	1	0.01	1000	1-10

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F. **Additional samples** may be taken at the owner's or owners' representatives' discretion. If airborne fiber counts exceed allowed limits additional samples may be taken as necessary to monitor fiber levels.

1.10 ANALYTICAL METHODS USED BY THE OWNER:

A. The following methods will be used by The Owner in analyzing filters used to collect air samples. Sampling rates may be varied from printed standards to allow for high volume sampling.

1. Phase Contrast Microscopy (PCM) will be performed using the NIOSH 7400 method.

2. Transmission Electron Microscopy (TEM) will be performed using the analysis method set forth in the AHERA regulation 40 CFR Part 763 Appendix A (when applicable).

1.11 LABORATORY TESTING BY OWNER:

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

B. **A complete record** of all air monitoring and results will be furnished to the owners' representative, the Owner, and the Contractor.

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

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

1.12 FIBERS AND STRUCTURES

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

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

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

1.13 ADDITIONAL TESTING:

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

1.14 PERSONAL MONITORING:

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

1.15 MISCELLANEOUS PROVISIONS

A. **None.**

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 STOP ACTION LEVELS:

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

STOP ACTION LEVEL (F/cc)	IMMEDIATELY STOP LEVEL (F/cc)	MINIMUM RESPIRATOR REQUIRED	PROTECTION FACTOR
0.1	0.5	Half face	10
0.5	2.5	PAPR	1,000
1.0	5.0	Supplied Air Pressure Demand	1,000

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

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

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

   a. Immediately erect new critical barriers as set forth in Section 01526 Temporary Enclosures to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, and floor).
   b. Decontaminate the affected area in accordance with Section 01712 Cleaning & Decontamination Procedures.
   c. Require that respiratory protection as set forth in Section 01562 Respiratory Protection be worn in affected area until area is cleared for re-occupancy in

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accordance with Section 01711 Project Decontamination.

d. Leave Critical Barriers in place until completion of work and insure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.

e. If the exit from the clean room of the personnel decontamination unit enters the affected area, establish a decontamination facility consisting of a Shower Room and Changing Room as set forth in Section 01563 Decontamination Units at entry point to affected area.

f. After Certification of Visual Inspection in the Work Area remove critical barriers separating the work area from the affected area. Final air samples will be taken within the entire area as set forth in Section 01711 Project Decontamination.

2. If the high reading was the result of other causes initiate corrective action as determined by the owners' representative.

C. **Effect on Contract Sum:** Complete corrective work with no change in the Contract Sum if high airborne fiber counts were caused by Contractor's activities. The Contract Sum and schedule will be adjusted for additional work caused by high airborne fiber counts beyond the Contractor's control.

3.2 STOP WORK:

A. **If the owner or owners' representative** presents a written stop work order, immediately and automatically conform to that stop work order, while maintaining temporary enclosures and pressure differential. Do not recommence abatement work until authorized in writing by owner or owners' representative.

B. **Immediately initiate the following actions:** After being presented with a stop work order immediately:

1. Cease all asbestos removal activities, or any other activities that disturbs asbestos-containing materials.

2. Repair any fallen, ripped or otherwise failed work area isolation measures.

3. Maintain in operation all work area isolation measures including those required by Sections 01526 "Temporary Enclosures," 01513 "Temporary Pressure Differential & Air Circulation System," 01563 "Decontamination Units."

4. Maintain all worker protections including those required by Sections 01560 "Worker Protection - Asbestos Abatement," and 01562 "Respiratory Protection."

5. Fog the air in the work area with a mist of amended water to reduce airborne fiber levels.

C. **Do not recommence work** until authorized in writing by the owner or owners' representative.

3.3 SCHEDULE OF ASBESTOS-CONTAINING MATERIALS:

Quantities are estimations only and need to be field verified by Contractor.

APPROXIMATE QUANTITIES AND LOCATIONS

CONTRACTOR MUST VERIFY ALL QUANTITIES AND LOCATIONS OF ASBESTOS-CONTAINING MATERIALS

Main Residential Structure

Location	Material	Quantity (Est.)	%Asbestos
Kitchen	9" x 9" Floor Tile (brown)	196 square feet	8% Chrysotile
Crawlspace	Furnace Insulation (brown)	64 square feet	60% Chrysotile

Detached Trailer

Location	Material	Quantity (Est.)	%Asbestos
Throughout	9" x 9" Floor Tile (blue)	304 square feet	8% Chrysotile
Kitchen	12" x 12" Floor Tile (red)	64 square feet	5% Chrysotile
Doors and Windows	Door/Window Caulk (black)	16 units	5% Chrysotile
Roof	Silver roof coat	304 square feet	3% Chrysotile
Roof	Roof Flashing (black)	304 square feet	5% Chrysotile

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SAMPLE

END OF SECTION - 01013

01028
Application for Payment – Asbestos Abatement

BrightFields, Inc.
Environmental Services

SECTION 01028 - APPLICATIONS FOR PAYMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

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

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

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

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1.3 SCHEDULE OF VALUES

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

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

a. Contractor's Construction Schedule.
b. Application for Payment forms, including Continuation Sheets.
c. List of subcontractors.
d. Schedule of allowances.
e. Schedule of alternates.
f. List of products.
g. List of principal suppliers and fabricators.
h. Schedule of submittals.

2. **Submit the Schedule of Values** to the Designer at the earliest possible date but no later

than 7 days before the date scheduled for submittal of the initial Applications for Payment.

3. **Subschedules:** Where Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

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

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

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

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

2. **Breakdown Contract Sum** into each of the following items:

   a. Mobilization
   b. Preparation of Work Area
   c. Site Demolition
   d. Asbestos Abatement
   e. Project Decontamination
   f. Other Work
   g. Project Closeout

3. **Arrange the Schedule of Values** in tabular form with separate columns to indicate the following for each item listed:

   a. Related Specification Sections or Divisions
   b. Description of Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value.
      1) Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project

Manual table of contents. Where appropriate, break principal subcontract amounts down into several line items.

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

6. Provide a separate line item in the Schedule of Values for each part of the Work involving installation of new materials, assemblies or systems where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.

   a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

7. For portions of the Work involving installation of new materials, assemblies or systems, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

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

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

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

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1.4 APPLICATIONS FOR PAYMENT

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

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

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

C. **Payment-Application Times:** The date for each progress payment is the 15th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days prior to the date for each progress payment.

D. **Payment-Application Forms:** Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment.

E. **Payment-Application Forms:** Use forms provided by the Owner for Applications for Payment. Sample copies are included at the end of this Section.

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

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

G. **Transmittal:** Submit 3 signed and notarized original copies of each Application for Payment to the Designer by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.

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

H. **Waivers of Mechanics Lien:** With each Application for Payment, submit partial waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract and related to the Work covered by the payment.

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

1. Submit partial waivers form each subcontractor, sub-subcontractor or supplier on each item provided by such an entity, for the amount requested, prior to deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers from the subcontractors, sub-subcontractors and suppliers providing that item.

3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

J. **Waiver Delays:** Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.

1. Submit final Applications for Payment with or preceded by final waivers from every entity

involved with performance of the Work covered by the application who is lawfully entitled to a lien.

K. **Waiver Forms:** Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.

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

1. Submittals designated as required ABefore Start of Work≅ by individual specification sections.
2. List of subcontractors.
3. List of principal suppliers and fabricators.
4. Schedule of Values.
5. Contractor's Construction Schedule (preliminary if not final).
6. Schedule of principal products.
7. Schedule of unit prices.
8. Submittal Schedule (preliminary if not final).
9. List of Contractor's staff assignments.
10. List of Contractor's principal consultants.
11. Copies of building permits.
12. Copies of authorizations and licenses from governing authorities for performance of the Work.
13. Initial progress report.
14. Report of preconstruction meeting.
15. Certificates of insurance and insurance policies.
16. Performance and payment bonds.
17. Data needed to acquire the Owner's insurance.
18. Initial settlement survey and damage report, if required.

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

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

2. Administrative actions and submittals that shall precede or coincide with this application include:

   a. Occupancy permits and similar approvals.
   b. Warranties (guarantees) and maintenance agreements.
   c. Test/adjust/balance records.
   d. Maintenance instructions.
   e. Meter readings.

f. Startup performance reports.
g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
h. Final cleaning.
i. Application for reduction of retainage and consent of surety.
j. Advice on shifting insurance coverages.
k. Final progress photographs.
l. List of incomplete Work, recognized as exceptions to Designer's Certificate of Substantial Completion.

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

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to Owner's access.
11 Disposal receipts, bills of lading and other required documentation of transportation and disposal of asbestos-containing waste.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

END OF SECTION 01028

01043
Project Coordination – Asbestos Abatement

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SECTION 01043 - COORDINATION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. General project coordination procedures.
2. Conservation.
3. Plan of Action.
4. Contingency Plan.
5. Project Directory.
6. Notifications.
7. Pre-Construction Inspection.
8. Contractor=s Construction Schedule.
9. Administrative and supervisory personnel.
10. Pre-Construction Conference
11. Progress Meetings
12. Coordination meetings.
13. Record Keeping.
14. Special Reports.

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

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

1.3 COORDINATION

A. **Owner Occupancy:** Coordinate construction operations and scheduling with partial occupancy requirements of the Owner and the Owner=s use of utilities.

B. **Coordinate construction operations** included in various Sections of these Specifications to assure efficient and orderly completion of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in the sequence required to obtain the best results where execution of one part of the Work depends on execution of other components, before or after its own execution.
2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
3. Make provisions to accommodate items scheduled for later installation.

C. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

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D. **Administrative Procedures:** Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

E. **Conservation:** Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 PLAN OF ACTION:

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

1. Submit the Plan of Action to the Designer for information only, prior to the start of work.

1.5 CONTINGENCY PLAN:

A. **Contingency Plan:** Prepare a contingency plan for emergencies or any other event that may require breaching of work area containment or modification or abridgement of decontamination or work area isolation procedures. Include in this plan procedures for performing electrical and mechanical repairs inside containment after abatement work has begun. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency. Items to be addressed in the plan include, but are not limited to the following:

1. Fire
2. Accident
3. Life threatening injury
4. Non life threatening injury
5. Rescue
6. Power Failure
7. Pressure differential system failure
8. Breach of containment
9. Electrical faults or shock
10. Excessive heat / cold (if/when such limits are specified)
11. Supplied air system failure
12. Water leaks
13. Waste spills
14. Unauthorized entry into work area
15. Elevated air samples outside of containment
16. Repairs inside containment
17. Toxic releases

1.6 PROJECT DIRECTORY

A. **Develop a directory** of all entities involved in the project. Include the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site. Identify individuals, their duties and responsibilities. List business name, contact person, normal business and emergency telephone, pager and fax numbers and addresses of:
1. Owner, Designer, and Project Administrator
2. Contractor's General Superintendent, supervisory personnel and Contractor's home office
3. Emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company.
4. Local, state, and federal agencies with jurisdiction over the project.

B. **Post:** Post copies of the Project Directory in the project meeting room, the temporary field office, each temporary telephone, and at entrance to clean room of Personnel Decontamination Unit

1.7 NOTIFICATIONS

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

1. Owners of the building/facility;
2. Employees who will perform asbestos abatement work or related activities, or who will be in the work area during the course of the work of this contract.
3. Employers of employees who work and/or will be working in adjacent areas during the course of the work of this contract.

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

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

1.8 PRE-CONSTRUCTION INSPECTION:

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

1.9 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. **Bar-Chart Schedule:** Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within 30 days after the date established for "Commencement of the Work."

4 Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values."

5 Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.

6 Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.

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

8 Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.

9 Indicate Clearance of each Work Area in advance of the dates established for Clearance. Allow time for testing and other Designer's procedures necessary for certification of Clearance.

10 Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Designer's procedures necessary for certification of Substantial Completion.

11 Indicate completion and Clearance of each Work Area in advance of the date established for Substantial Completion. Allow time for testing and other Designer's procedures necessary for certification of Clearance and Substantial Completion.

B. **Phasing:** On the schedule, show how requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner affect the sequence of Work.

C. **Work Stages:** Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.

12 Non-asbestos demolitions.
13 Preparation of the Work Area.
14 Asbestos removal.
15 Clearance testing.
16 Substantial Completion.

D. **Area Separations:** Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

E. **Cost Correlation:** At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of Work performed as of the dates used for preparation of payment requests.

17. Refer to Division 1 Section "Applications for Payment" for cost reporting and payment procedures.

F. **Distribution:** Following response to the initial submittal, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

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

G. **Schedule Updating:** Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

1.10 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

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

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

20 Experience: The General Superintendent must have demonstrable experience in the successful management of asbestos abatement projects that are similar to the work of this contract.

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

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

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

B. Supervisors / Forepersons: Provide full-time Supervisors / Forepersons who are experienced in the supervision of asbestos abatement work areas including work practices, building and personnel, disposal practices, etc. These persons are contractor employees directly responsible to the General Superintendent.

C. Accreditation: The General Superintendent, Supervisors and Forepersons are to be accredited as an Asbestos Abatement Supervisor in accordance with the AHERA regulation 40 CFR Part 763, Subpart E, Appendix C.

1.11 PRE-CONSTRUCTION CONFERENCE:

A. **An initial progress meeting**, recognized as "Pre-Construction Conference" will be convened by the Designer prior to start of any work. The preconstruction conference will be scheduled before start of construction, at a time convenient to the Owner and the Designer, but no later than 15 days after execution of the Agreement. Meet at the project site, or as otherwise directed, with General Superintendent, Owner, Designer, Project Administrator, and other entities concerned with the asbestos abatement work.

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

22. 72 hours advance notice will be provided to all participants prior to convening Pre-Construction Conference.

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

1. Tentative construction schedule.
2. Critical work sequencing.
3. Designation of responsible personnel.
4. Procedures for processing field decisions and Change Orders.
5. Procedures for processing Applications for Payment.
6. Distribution of Contract Documents.
7. Submittal of Shop Drawings, Product Data, and Samples.
8. Preparation of record documents.
9. Use of the premises.
10. Parking availability.
11. Office, work, and storage areas.
12. Equipment deliveries and priorities.
13. Safety procedures.
14. First aid.
15. Security.
16. Housekeeping.
17. Working hours.

1.12 PROGRESS MEETINGS:

A. **General:** In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, the Designer will hold general progress meetings as required. These meeting will be scheduled, where possible, at time of preparation of payment request.

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

C. **Agenda:** Be prepared to discuss the following items at the progress meetings. Review other items of significance that could affect progress.

23 Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.

24 Review the present and future needs of each entity present, including the following:

- **a.** Interface requirements.
- **b.** Time.
- **c.** Sequences.
- **d.** Status of submittals.
- **e.** Deliveries.
- **f.** Access.
- **g.** Site utilization.
- **h.** Temporary facilities and services.
- **i.** Hours of work.
- **j.** Hazards and risks.
- **k.** Housekeeping.
- **l.** Quality and work standards.
- **m.** Change Orders.
- **n.** Documentation of information for payment requests.

D. **Reporting:** Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule no later than 3

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days after each meeting. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1.13 COORDINATION MEETINGS

A. **Attend project coordination meetings** that will conducted by the Designer at regular intervals convenient for all parties involved. Project coordination meetings are intended to coordinate the work of all contractors performing work on the site, and are in addition to specific meetings held for other purposes, such as regular progress meetings.

1.14 RECORD KEEPING:

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

25 Meetings; purpose, attendees, brief discussion

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

27 Documentation of Contractor's completion of the following:

a. Inspection of work area preparation prior to start of removal and daily thereafter.
b. Removal of any sheet plastic barriers
c. Contractor's inspections prior to spray back, lock back, encapsulation, enclosure or any other operation that will conceal the condition of ACM or the substrate from which such materials have been removed.
d. Removal of waste materials from work area
e. Decontamination of equipment (list items)
f. Contractors final inspection/final air test analysis.

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

28 Visitations; authorized and unauthorized with the following information

a. Name
b. Organization
c. Entry time
d. Exit Time
e. Respiratory protection

29 Personnel, by name, entering and leaving the work area with the following information

a. Printed Name
b. Identification Number
c. Entry Time
d. Exit Time
e. Respiratory Protection

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

D. **Records in Decontamination Unit:** Maintain the following documentation in the Decontamination Unit, in a location accessible to workers.
30 Documentation of inspections by OSHA, EPA or local authority
31 Respiratory Protection Program.

E. **Other records:** Maintain other documentation in a location that is accessible to the Owner, Designer, and Project Administrator including:
32 Waste Manifests and shipping records
33 Landfill receipts.
34 Accident reports.

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1.15 SPECIAL REPORTS:

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

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

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

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

1.16 SUBMITTALS

A. **Before the Start of Work:** Submit the following to the Designer in the same manner as product data. Do not begin work until these submittals are returned with designer=s action stamp indicating that all submittals have been Areceived-not reviewed≅.

35. Plan of Action.

36. Contingency Plans.
37. Project Directory.
38. Notifications: copy of notification sent to other entities at the work site, and to emergency service agencies.
39. Pre-Construction Inspection: Report on inspection carried out as required by this section. Include copies of all photographs, video tapes, etc.
40. Contractor's Construction Schedule.
41. Accreditation: Submit evidence in the form of training course certificates for the General Superintendent, Supervisors, and Forepersons as asbestos abatement supervisors in accordance with AHERA requirements. Submit evidence in the form of training course certificates that each worker is trained as an asbestos abatement worker in accordance with AHERA requirements.
42. Resume: Submit resume of General Superintendent

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

C. **Project Close-out:** Submit two (2) copies for information purposes of all documents indicated in the following sections at final closeout of project as a project close-out submittal.
1. Section on Record Keeping.
2. Section on Special Reports.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

END OF SECTION - 01043

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01046
Cutting and Patching – Asbestos Containing Materials

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SECTION 01046 - CUTTING AND PATCHING - ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

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

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

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

1.3 SUBMITTALS

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

1. Tools: equipped with HEPA vacuum dust collection attachments

PART 2 - PRODUCTS

2.1 EQUIPMENT

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

2.2 PRODUCTS

A. Products for encapsulation are specified in Section 09805.

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PART 3 - EXECUTION

3.1 WORK PRACTICES

A. Before beginning work of this section, comply with:
1. Section 01527 - Regulated Areas
2. Section 01561 - Worker Protection - Repair & Maintenance
3. Section 01562 - Respiratory Protection

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

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

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

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

END OF SECTION - 01046

01097
Reference Standards and Definitions – Asbestos Abatement

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SECTION 01097 - REFERENCE STANDARDS AND DEFINITIONS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

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

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

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

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

4. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

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

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

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

8. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular

construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.

a. The term "experienced," when used with the term "installer," means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.

b. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

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

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

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

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

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

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

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

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

B. Definitions Relative to Asbestos Abatement:

1. AAdequately Wet≅ means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from the asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.

2. "Asbestos": The asbestiform varieties of chrysotile (serpentine), amosite (cummingtonite-grunerite), crocidolite (riebeckite), tremolite, anthophyllite, actinolite, and any of these minerals that has been chemically treated and/or altered. For purposes of the contract documents materials described in the contract documents as asbestos are to be considered as asbestos.

3. "Asbestos-Containing Material (ACM)": Any material containing more than 1% asbestos as determined using the methods specified in appendix A, subpart F, 40 CFR part 763, section 1, Polarized Light Microscopy.

4. "Asbestos-Containing Waste Material": any waste that contains asbestos. This term includes filters or other materials contaminated with asbestos. This term also includes regulated asbestos-containing material waste and materials contaminated with asbestos including disposable equipment and clothing.

5. "Asbestos debris": pieces of ACM that can be identified by color, texture, or composition, or dust, if the dust is determined by an accredited inspector to be ACM.

6. "Certified Industrial Hygienist (C.I.H.)": one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

7. "Competent person" : an individual who meets the requirements of OSHA as a Acompetent person≅ for the specific activity involved in the work. The Acompetent person≅ must meet the requirements of 29 CFR 1926.32(f), and 29 CFR 1926.1101.

8. "Filter": A media component used to remove solid or liquid particles from air and water.

9. "Friable Asbestos": any asbestos-containing material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

10. "Grinding" : to reduce to powder or small fragments and includes manual or mechanical chipping or drilling.

11. "HEPA Filter": A High Efficiency Particulate Air (HEPA) filter capable of trapping and retaining 99.97% of all mono-dispersed particles of 0.3 microns in diameter.

12. "HEPA Filter Vacuum Collection Equipment (or vacuum cleaner)": High efficiency particulate air filtered vacuum collection equipment with a HEPA filter.

13. "Intact" : that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

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

15. "Negative Pressure Enclosure (NPE) ": A pressure differential and ventilation system where the work area is maintained at a negative pressure relative to air pressure outside the work area.

16. "Nonfriable Material" : any material that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure and has not been rendered friable.

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

18. "Surfacing material" : material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

19. "Thermal system insulation (TSI)" : insulation applied to pipes, fittings, boilers, breeching, tanks, ducts or other components to prevent heat loss or gain.

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20. "Time Weighted Average (TWA)": The average concentration of a contaminant in air during a specific time period as determined by the method prescribed in Appendix A of 29 CFR part 1926.1101.

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

22. "Working Day" : Monday through Friday and includes holidays that fall on any of the days Monday through Friday as indicated in the notification requirements.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. **Specification Format:** These Specifications are organized into Divisions and Sections based on CSRF's 16-Division format and MasterFormat's numbering system.

B. **Specification Content:** This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. **Abbreviated Language:** Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. **Streamlined Language:** The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.

1.4 INDUSTRY STANDARDS

A. **Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.

C. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Designer before proceeding for a

decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.

1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Designer for a decision before proceeding.

D. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

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

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

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

   a. Fundamentals Governing the Design and Operation of Local Exhaust Systems Publication Z9.2
   b. Practices for Respiratory Protection Publication Z88.2

2. American Society for Testing and Materials (ASTM)
   100 Bar Harbor Drive
   West Conshocken, PA 19428-2959
   (610) 832-9585

   a. Safety and Health Requirements Relating to Occupational Exposure to Asbestos E 849

   b. ASTM Standard Practice for Encapsulants for Spray-or-Trowel-Applied Friable Asbestos-Containing Building Materials E1494

   c. ASTM Standard Practice for Visual Inspection of Asbestos Abatement Projects E1368

F. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating

organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research Co.'s "Encyclopedia of Associations," available in most libraries.

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

1. ACI American Concrete Institute
   P.O. Box 19150
   Detroit, MI 48219 (313) 532-2600

2. ACIL American Council of Independent Laboratories
   1629 K St., NW
   Washington, DC 20006 (202) 887-5872

3. ACPA American Concrete Pipe Assoc.
   8300 Boone Blvd., Suite 400
   Vienna, VA 22182 (703) 821-1990

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

5. AIA The American Institute of Architects
   1735 New York Ave., NW
   Washington, DC 20006 (202) 626-7300
6. AIHA American Industrial Hygiene Assoc.
   2700 Prosperity Ave., Suite 250
   Fairfax, VA 22031 (703) 849-8888

7. ANSI American National Standards Institute
   11 West 42nd St., 13th Floor
   New York, NY 10036 (212) 642-4900

8. ASHRAE American Society of Heating,
   Refrigerating and Air-Conditioning Engineers
   1791 Tullie Circle, NE
   Atlanta, GA 30329 (404) 636-8400

9. ASME American Society of Mechanical Engineers
   345 East 47th St.
   New York, NY 10017 (212) 705-7722

10. ASPE American Society of Plumbing Engineers
3617 Thousand Oaks Blvd., Suite 210
Westlake, CA 91362 (805) 495-7120

11. ASTM American Society for Testing and Materials
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959 (610) 832-9585

12. CGA Compressed Gas Assoc.
1725 Jefferson Davis Highway, Suite 1004
Arlington, VA 22202-4100 (703) 412-0900

13. FM Factory Mutual Systems
1151 Boston-Providence Turnpike
P.O. Box 9102
Norwood, MA 02062 (617) 762-4300

14. GA Gypsum Association
810 First St., NE, Suite 510
Washington, DC 20002 (202) 289-5440

15. IEEE Institute of Electrical and Electronic Engineers
345 E. 47th St.
New York, NY 10017 (212) 705-7900

16. IETA International Electrical Testing Assoc.
P.O. Box 687
Morrison, CO 80465 (303) 697-8441

17. IRI Industrial Risk Insurers
P.O. Box 5010
85 Woodland St.
Hartford, CT 06102-5010 (203) 520-7300

18. ISA Instrument Society of America
P.O. Box 12277
67 Alexander Dr.
Research Triangle Park, NC 27709 (919) 549-8411

19. ISO International Standards Organization

20. NEC National Electrical Code (from NFPA)

21. NECA National Electrical Contractors Assoc.

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3 Bethesda Metro Center, Suite 1100
Bethesda, MD 20814 (301) 657-3110

22. NEMA National Electrical Manufacturers Assoc.
2101 L St., NW, Suite 300
Washington, DC 20037 (202) 457-8400

23 NFPANational Fire Protection Assoc.
One Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101 (617) 770-3000 (800) 344-3555

24 NRCA National Roofing Contractors Assoc.
10255 W. Higgins Rd., Suite 600
Rosemont, IL 60018-5607 (708) 299-9070

25 RFCI Resilient Floor Covering Institute
966 Hungerford Dr., Suite 12-B
Rockville, MD 20805 (301) 340-8580

26 UL Underwriters Laboratories
333 Pfingsten Rd.
Northbrook, IL 60062 (708) 272-8800

27 White Lung Association
PO Box 1483
Baltimore, MD 21203

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

28 CE Corps of Engineers
(U.S. Department of the Army)
Chief of Engineers - Referral
Washington, DC 20314 (202) 272-0660

29 CFR Code of Federal Regulations
(Available from the Government Printing Office)
N. Capitol St. between G and H St., NW
Washington, DC 20402 (202) 783-3238
(Material is usually first published in the "Federal Register")

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

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

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

33 DOT Department of Transportation
400 Seventh St., SW
Washington, DC 20590 (202) 366-4000

34 EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460 (202) 260-2090

35 FS Federal Specification (from GSA)
Specifications Unit (WFSIS)
7th and D St., SW
Washington, DC 20407 (202) 708-9205

36 GSA General Services Administration
F St. and 18th St., NW
Washington, DC 20405 (202) 708-5082

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

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

39 OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
200 Constitution Ave., NW
Washington, DC 20210 (202) 219-6091

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

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

I. Trade Union Jurisdictions: The Contractor shall maintain, and require subcontractors to maintain, complete current information on jurisdictional matters, regulations and pending actions, as applicable to construction activities. The manner in which Contract Documents have been organized and subdivided is not intended to be indicative of trade union or jurisdictional agreements.

42 Discuss new developments at project meetings at the earliest feasible dates. Record relevant information and actions agreed upon.

43 Assign and subcontract construction activities, and employ tradesmen and laborers in a manner that will not unduly risk jurisdictional disputes that could result in conflicts, delays, claims and losses.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01097

01098
Codes, Regulations, and Standards – Asbestos Abatement

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Environmental Services

SECTION 01098 - CODES, REGULATIONS AND STANDARDS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY

A. This section sets forth governmental regulations which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.
   1. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations and standards.
   2. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

1.3 CODES, REGULATIONS AND STANDARDS

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

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

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

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

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

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

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

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

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

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

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

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

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

   j. Shipyard Industry
   Title 29 Part 1915 Section 1001 of the Code of Federal Regulations

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

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

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

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

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

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

b. Asbestos Hazard Emergency Response Act (AHERA) Regulation
Title 40, Part 763, Sub-part E of the Code of Federal Regulations

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

d. National Emission Standard for Hazardous Air Pollutants (NESHAP)
National Emission Standard for Asbestos
Title 40, Part 61, Sub-part A, and Sub-part M (Revised Sub-part B) of the Code of Federal Regulations

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

1. **DNREC:** State of Delaware, Department of Natural Resources and Environmental Control (DNREC)

a. "Delaware Regulations Governing the Control of Air Pollution Emission Standard for Asbestos". November 27, 1985, updated June 16, 1995

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

3. State of Delaware Hazardous Chemical Information Act (Right to Know).

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

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

1.4 NOTICES:

A. U.S. ENVIRONMENTAL PROTECTION AGENCY

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

a. REGION 1:
Asbestos NESHAP Contact
Air Management Division
USEPA
JFK Federal Building
Boston, MA 02203
(617)565-3260

b. REGION 2:
Asbestos NESHAP Contact
Air & Waste Management Division
USEPA
26 Federal Plaza
New York, NY 10007
(212)264-9627

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

d. REGION 4
Asbestos NESHAP Contact
Air, Pesticide & Toxic Management
USEPA
345 Courtland Street N.E.
Atlanta, GA 30365
(404) 347-5014

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e. REGION 5
Asbestos NESHAP Contact
Air & Radiation Division
USEPA
230 S. Dearborn Street
Chicago, Illinois 60604
(312) 886-6793

f. REGION 6
Asbestos NESHAP Contact
Air, Pesticides & Toxics Division
USEPA
1445 Ross Avenue, Suite 1200
Dallas, TX 75202
(214) 655-7223

g. REGION 7
Asbestos NESHAP Contact
Air Management Division
USEPA
726 Minnesota Avenue
Kansas City, KS 66101
(913) 551-7020

h. REGION 8
Asbestos NESHAP Contact
Air & Waste Management Division
USEPA
One Denver Place
999 18th Street, Suite 500
Denver, CO 80202-2405
(303) 293-7685

i. REGION 9
Asbestos NESHAP Contact
Air Management Division
USEPA
215 Fremont Street
San Francisco, CA 94105
(415) 556-5474

j. REGION 10
Asbestos NESHAP Contact
Air & Toxics Management Division
USEPA
1200 Sixth Avenue
Seattle, WA 98101
(206) 442-1757

2. There is a copy of the NESHAP form at the end of this section.

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

a. Indication whether the notification is the original or revised notification
b. Name, address, and telephone number of owner or operator.
c. Name, address, and telephone number of contractor.
d. Type of Operation (demolition or renovation).
e. Description of the facility or affected part of the facility being demolished or renovated, including the size (square feet [square meters], number of floors), age, present and prior use of the facility.
f. Estimate of the approximate amount of RACM to be removed from the facility in terms of linear meters [linear feet] of pipe, and surface area in square meters [square feet] of other facility components. Also estimate the approximate amount of Category I and Category II nonfriable ACM in the affected part of the facility that will not be removed before demolition.
g. For facilities in which the amount of friable asbestos materials less than 80 linear meters (260 linear feet) on pipes and less than 15 square meters (160 square feet) or 1 cubic meter (35 cubic feet) if the length and width could not be measured. On other facility components, explain techniques of estimation.
h. Location and street address (including building number or name and floor or room number, if appropriate), city county, and state, of the facility being demolished or renovated.
i. Scheduled starting and completion dates of asbestos removal work (or any other activity, such as site preparation that would break up, dislodge, or similarly disturb asbestos material) in a demolition or renovation; planned renovation operations involving individual nonscheduled operations shall only include the beginning and ending dates of the report period as described in paragraph (a)(4)(iii) of 40 CFR 61.145.
j. Scheduled starting and completion dates of demolition or renovation.
k. Nature of planned demolition or renovation and method(s) to be used, including demolition or renovation techniques to be used and description of affected facility components.
l. Procedures to be used to comply with the requirements of USEPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Asbestos Regulations (40 CFR 61 Subpart M).

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

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

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

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

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

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

B. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION

1. Send a copy of evaluation and certification of alternative work procedures to the national office of OSHA, Office of Technical Support, Room N3653, 200 Constitution Avenue, NW, Washington, DC 20210 before work which involves the removal of more than 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of thermal system insulation or surfacing material is begun using an alternative method.

C. STATE AND LOCAL AGENCIES:

1. Send written notification as required by state and local regulations prior to beginning any work on ACM.

1.5 PERMITS:

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

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

1.6 LICENSES:

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

1.7 POSTING AND FILING OF REGULATIONS

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

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1.8 SUBMITTALS:

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

1. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work including:
   a. State and Local Regulations: Submit copies of codes and regulations applicable to the work.
2. Notices: Submit notices required by federal, state and local regulations together with proof of timely transmittal to agency requiring the notice.
3. Permits: Submit copies of current valid permits required by state and local regulations.
4. Licenses: Submit copies of all State and local licenses and permits necessary to carry out the work of this contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION - 01098

BrightFields, Inc.

01301
Submittals – Asbestos Abatement

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Environmental Services

SECTION 01301 - SUBMITTALS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Contractor's construction schedule
2. Submittal schedule
3. Daily construction reports.
4. Quality Assurance Submittals

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

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors
6. Non-collusion statement
7. General statement
8. Requests for change order

C. RELATED SECTIONS

1. The following Sections contain requirements that relate to this Section:

a. Division 1 Section "Applications for Payment - Asbestos Abatement" specifies requirements for submittal of the Schedule of Values.

b. Division 1 Section "Coordination" specifies requirements governing submittal and distribution of meeting and conference minutes.

c. Division 1 Section "Project Closeout-Asbestos Abatement" specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 SUBMITTAL PROCEDURES

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

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

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
   a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

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

1. Allow 2 weeks for initial review. Allow additional time if the Designer must delay processing to permit coordination with subsequent submittals.
2. If an intermediate submittal is necessary, process the same as the initial submittal.
3. Allow 2 weeks for reprocessing each submittal.
4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Designer sufficiently in advance of the Work to permit processing.

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

1. Provide a space approximately 4 by 5 inches (100 by 125 mm) on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

   a. Project name.
   b. Date.
   c. Name and address of the Designer.
   d. Name and address of the Contractor.
   e. Name and address of the subcontractor.
   f. Name and address of the supplier.
   g. Name of the manufacturer.
   h. Number and title of appropriate Specification Section.
   i. Drawing number and detail references, as appropriate.

D. **Submittal Transmittal:** Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Designer using a transmittal form. The Designer will not accept submittals received from sources other than the Contractor.

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

E. **Transmittal Form:** Use AIA Document G810.

F. **Transmittal Form:** Use the sample form at the end of this Section for transmittal of submittals.

1.4 SUBMITTAL SCHEDULE

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

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

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.
2. Prepare the schedule in chronological order. Provide the following information:

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

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

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

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

1.5 QUALITY ASSURANCE SUBMITTALS

A. **Submit quality-control submittals,** including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

B. **Certifications:** Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

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1.6 MISCELLANEOUS SUBMITTALS:

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

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

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

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

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

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

1.7 DESIGNERS/ENGINEER ACTION

A. Except for submittals for the record or information, where action and return is required, the Designer will review each submittal, mark to indicate action taken, and return promptly.
3.g Compliance with specified characteristics is the Contractor's responsibility.

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

4.g Final Unrestricted Release: When the Designer marks a submittal "Approved," the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.

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

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

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

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

8.g Other Action: Where a submittal is for information or record purposes or special processing or other activity, the Designer will return the submittal marked "Action Not Required."

C. **Unsolicited Submittals:** The Designer will return unsolicited submittals to the sender without action.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01301

BrightFields, Inc.

01310
Schedule

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A Site Specific Division 1, Section 01310
will be prepared, as appropriate, for each project

01503
Construction Facilities and Temporary Controls – Asbestos Abatement

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Environmental Services

SECTION 01503 - TEMPORARY FACILITIES - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY

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

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

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

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

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

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

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

1.3 DESCRIPTION OF REQUIREMENTS:

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

1.4 SUBMITTALS

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

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

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1.5 QUALITY ASSURANCE

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

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

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

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

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

1.6 PROJECT CONDITIONS

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

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

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. **General:** Provide new materials and equipment. If acceptable to the Designer, the Contractor may use undamaged, previously used materials and equipment in serviceable condition. Provide materials and equipment suitable for use intended.

B. **Lumber and Plywood:**

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

2. For fences and vision barriers, provide minimum 3/8-inch- (9.5mm) thick exterior plywood.

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

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

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

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2.2 WATER SERVICE

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

B. **Temporary Water Service Connection:** Connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment. Provide separate hoses and/or/ pumps for shower water and amended water, without the possibility of cross connection.

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

1. Provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

D. **Hot Water Heater:** Provide UL rated minimum 40 gallon (150 liters) electric hot water heater to supply hot water for the Decontamination Unit shower. Activate from 30 amp circuit breaker located within the Decontamination Unit subpanel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 12" X 12" X 6" (30 cm. X 30 cm. X 15 cm) deep pan, made of 19 gauge galvanized steel, with handles. A 3-quart (3 liter) kitchen saucepan may be substituted for this purpose. Drip pan shall be securely fastened to the hot water heater with bailing wire or similar material. Wiring of the hot water heater shall be in compliance with NEMA, NECA, and UL standards.

2.3 ELECTRICAL SERVICE:

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

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

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

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

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

E. **Electrical Power Cords:** Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of

electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

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

2.4 TEMPORARY HEAT:

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

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2.5 TEMPORARY COOLING; IF NECESSARY:

A. **Cooling Units:** Provide temporary cooling units consisting of a fan coil unit inside the work area with a compressor and heat rejection coil outside.

2.6 TEMPORARY STRUCTURES

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

B. **Temporary Toilet Units:** Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

2.7 FIRST AID

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

2.8 FIRE EXTINGUISHERS:

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

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

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

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

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

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

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3.2 SCAFFOLDING:

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

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

C. **At the completion of abatement work** clean construction aids within the work area, wrap in one layer of 6 mil (0.15 mm) polyethylene sheet and seal before removal from the Work Area.

3.3 TEMPORARY UTILITY INSTALLATION

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

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

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

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

B. Water Service:

1. Water connection (without charge) to Owner's existing potable water system is limited to one 3/4" (19 mm) pipe-size connection, and a maximum flow of 10 g.p.m. (38 liters / minute) each to hot and cold water supply. Install using vacuum breakers or other backflow preventer as required by local authority. Hot water shall be supplied at a minimum temperature of 100 degrees F (35 degrees C). Supply hot and cold water to the Decontamination Unit in accordance with Section 01563.

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

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

C. Electrical Service:

1. Lock out: Lock out all existing power to or through the work area as described below. Unless specifically noted otherwise existing power and lighting circuits to the Work Area are not to be used. All power and lighting to the Work Area and Decontamination facilities are to be provided from temporary electrical panel described below.

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

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

   c. Lock out power to circuits running through Work Area wherever possible by switching off and locking all breakers serving these circuits. Tag-out breakers with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to authorized person who has applied locks. If circuits cannot be shut down for any reason, label at intervals of 4-feet" (1.25 meter) on center with signs reading, "DANGER Live Electric Circuit. Electrocution Hazard." All asbestos abatement work in the vicinity of the live circuit is to be performed dry. All necessary notifications and procedures for dry removal are to be followed.

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

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

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

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

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

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

   a. One Circuit for each HEPA filtered fan unit

   b. For power tools and task lighting, provide one temporary 4-gang outlet in the following locations. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).

   c. One outlet in the work area for each 2500 square feet (225 square meters) of work area

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

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

   a. One in each work area

   b. One at clean side of each Decontamination Unit.

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

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

a. Five inside work area

b. Two outside work area in location designated by Designer

D. Temporary Lighting:

1. Lock out: Lock out existing power to lighting circuits in Work Area as described in section 01526 Temporary Enclosures. Unless specifically noted otherwise existing lighting circuits to the Work Area are not to be used. All lighting to the Work Area and Decontamination facilities is to be provided from temporary electrical panel described above.

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

a. One 200-watt incandescent lamp per 1000 square feet (92.9 square meters) of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 50 feet (15.2 meters). In stair ways and at ladder runs, provide one lamp minimum per story, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.

b. Provide lighting in areas where work is being preformed as required to supply a 100 foot candle (1,076 lumens/sq meter) minimum light level.

c. Provide lighting in any area being subjected to a visual inspection as required to supply a 100 foot candle (1,076 lumens/sq meter) minimum light level.

d. Provide lighting in the Decontamination Unit as required to supply a 50 foot candle (538 lumens/sq meter) minimum light level.

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

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

E. Temporary Heat:

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

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

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

7. Maintain a minimum temperature of 70 degrees F (21 degrees C). where finished work has been installed.

8. Maintain a minimum temperature of 75 degrees F (24 degrees C).in the shower of the decontamination unit.

9. Maintain a minimum temperature of 65 degrees F (18 degrees C) in the Work Area at all times that work is going on. At all other times and at completion of removal work, but before start of reconstruction work, maintain a minimum temperature of 50 degrees F (10 degrees C).

10. Maintain a minimum temperature of 50 degrees F (10 degrees C) in the Work Area at all times during and after removal work.

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F. Temporary Cooling:

11. Required Cooling: Provide units sufficient to supply 20,000 BTU/hr (5,862 w) of cooling per 8,000 cubic feet (225 cubic meters) of work area.

G. Temporary Utilities

12. Temporary Telephones: Provide temporary telephone service throughout the construction period for personnel engaged in construction activities. Install telephone on a separate line for each temporary office and first-aid station.

13 Separate Telephone Lines: Provide additional telephone lines for the following:

a. Where an office has more than 2 occupants, install a telephone for each additional occupant or pair of occupants.

b. Provide a dedicated telephone line for a fax machine in the field office.

c. Provide a separate line for the Owner's use.

d. At each telephone, post a list of emergency telephone numbers.

H. Sanitary Facilities:

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

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

15. Toilets: Use of the Owner's existing toilet facilities will be permitted, so long as facilities are cleaned and maintained in a condition acceptable to the Owner. At Substantial Completion, restore these facilities to the condition prevalent at the time of initial use.

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

17 Provide separate facilities for male and female personnel.

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

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

a. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F (7.2 to 12.8 deg C).

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

a. Filter out excessive amounts of soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
b. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. Following heavy use, restore normal conditions promptly.

3.4 SUPPORT FACILITIES INSTALLATION

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

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

B. **Provide incombustible construction** for offices, shops, and sheds located within the construction area or within 30 feet (9 m) of building lines. Comply with requirements of NFPA 241.

C. **Project Administrator's Field Office:** Provide air conditioned, heated office space near the Work Area for professional person, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. (25 sq meters) floor area. Equip office with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36 inches X 96 inches (1 m X 2.5 m) plan table, and one 24 inches X 48 inches (0.62 m X 1.25 m) work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.

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D. **Field Laboratory:** Provide air conditioned, heated office space near the Work Area for a laboratory space, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. (25 sq meters) floor area. Equip field laboratory with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36 inches X 96 inches (1 m X 2.5 m) plan table, and one 24 inches X 48 inches (0.62 m X 1.25 m) work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.

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

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

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

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

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

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

25. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 sq. ft. (2.3 sq. m) or less with plywood or similar materials.

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

27. Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL-labeled, fire-retardant-treated material for framing and main sheathing.

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

3.5 FIRE PROTECTION FACILITIES INSTALLATION

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

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

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

29. Store combustible materials in fire proof containers or fire-safe locations.

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

31. Prohibit smoking in hazardous fire-exposure areas.

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

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

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

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

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3.6 OPERATION, TERMINATION, AND REMOVAL

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

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

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

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

C. **Termination and Removal:** Unless the designer requests that it be maintained longer, remove each temporary facility when the need has ended, when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility.

Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

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

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

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

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

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

END OF SECTION 01503

01513
Temporary Pressure Differential and Air Circulation System

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Environmental Services

SECTION 01513 - TEMPORARY PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED SECTIONS

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

1.3 MONITORING

A. **Continuously monitor** and record the pressure differential between the Work Area and the building outside of the Work Area with a monitoring device incorporating a continuous recorder (e.g. strip chart).

1.4 SUBMITTALS

A. **Before Start of Work:** Submit design of pressure differential system to the Designer for review. Do not begin work until submittal is returned with the Designer's action stamp indicating that the submittal is returned for unrestricted use. Include in the submittal at a minimum:

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

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

B. **On a weekly basis:** Submit printout from pressure differential monitoring equipment. Mark printout with date and start of time for each day. Use printout paper that indicates elapsed time in intervals no greater than hours. Indicate on each days record times of starting and stopping abatement work, type of work in progress, breaks for lunch or other purposes, periods of stop work, and filter changes. Cut printout into segments by day, attach to 8 2" by 11" [215 X 280 mm] paper. Label with project name, contractors name and date.

1.5 QUALITY ASSURANCE:

A. **Monitor pressure differential** at Personnel and Equipment Decontamination Units with a differential pressure meter equipped with a continuous recorder. Meter shall be equipped with a warning buzzer which will sound if pressure differential drops below 0.02 inch [0.5 mm] of water.

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PART 2 - PRODUCTS

2.1 HEPA FILTERED FAN UNITS:

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

B. **Cabinet:** Constructed of durable materials able to withstand damage from rough handling and transportation. The width of the cabinet should be less than 30 inches [0.76 meters] to fit through standard-size doorways. Provide units whose cabinets are:
   1. Factory-sealed to prevent asbestos-containing dust from being released during use, transport, or maintenance
   2. Arranged to provide access to and replacement of all air filters from intake end
   3. Mounted on casters or wheels

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

D. **HEPA Filters:** Provide units whose final filter is the HEPA type with the filter media (folded into closely pleated panels) completely sealed on all edges with a structurally rigid frame.
   1. Provide units with a continuous rubber gasket located between the filter and the filter housing to form a tight seal.
   2. Provide HEPA filters that are individually tested and certified by the manufacturer to have an efficiency of not less than 99.97 percent when challenged with 0.3 um dioctylphthalate (DOP) particles when tested in accordance with Military Standard Number 282 and Army Instruction Manual 136-300-175A. Provide filters that bear a UL586 label to indicate ability to perform under specified conditions.
   3. Provide filters that are marked with: the name of the manufacturer, serial number, air flow rating, efficiency and resistance, and the direction of test air flow.
   4. Pre-filters, which protect the final filter by removing the larger particles, are required to prolong the operating life of the HEPA filter. Two stages of pre-filtration are required. Provide units with the following pre-filters:
      a. First-stage pre-filter: low-efficiency type (e.g., for particles 100 um and larger)
      b. Second-stage (or intermediate) filter: medium efficiency (eg., effective for particles down to 5 um)
      c. Provide units with pre-filters and intermediate filters installed either on or in the intake grid of the unit and held in place with special housings or clamps.

E. **Instrumentation:** Provide units equipped with:
   1. Magnehelic gauge or manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed
   2. A table indicating the usable air-handling capacity for various static pressure readings on the Magnehelic gauge affixed near the gauge for reference, or the Magnehelic reading

indicating at what point the filters should be changed, noting Cubic Feet per Minute (CFM) (Liters / Second (LPS)) air delivery at that point

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

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

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

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

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

1. **HEPA filtered Fan Units:** The following machines are standard 2000 CFM machines used in typical asbestos abatement jobs.

Aerospace America, Inc. "Aero-Clean 2000"
900 Truman Parkway
P.O. Box 189
Bay City, Michigan 48707
(517) 684-2121

Abatement Technologies "HEPA-AIRE 1990 and HEPA-AIRE 2000"
3305 Breckinridge Blvd. #118
Deluth, GA 30136
(800) 634-9091 or (404) 925-2761

Global Consumer Services, Inc.
4615-1U E. Industrial St.
Sims Valley, CA 93063
(805) 579-0230

M-Tec Corp. Micro-Trap
1300 W. Steel Rd. Alumina II
Unit #2
Morrisville, PA 19067
(215) 295-8208

2. **Large Capacity:** The following are large capacity 5000-6000 CFM machines used on large asbestos abatement jobs.

   Abatement Technologies — "HEPA-AIRE 5000"
   3305 Breckinridge Blvd. #118 — model H5000C
   Deluth, GA 30136
   (800) 634-9091 or (404) 925-2761

3. **Hazardous Locations:** The following are pneumatically powered machines for use in asbestos abatement jobs in hazardous locations where electric motors are prohibited.

   Abatement Technologies — "HEPA-AIRE PNEUMATIC"
   3305 Breckinridge Blvd. #118 — model H2000P
   Deluth, GA 30136
   (800) 634-9091 or (404) 925-2761

2.2 AUXILIARY GENERATOR:

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

2.3 AUXILIARY POWER SWITCH:

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

PART 3 - EXECUTION

3.1 PRESSURE DIFFERENTIAL ISOLATION

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

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

1. 0.02 inches (0 .5 mm) of water.

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

1. Establish required air circulation in the work area, personnel and equipment decontamination units.
2. Establish isolation by increased pressure in adjacent areas or as part of seals where required.
3. Exhaust a sufficient number of units from the work area to develop the required pressure differential.
4. The required number of units is the number determined above plus one additional unit.
5. Vent HEPA filtered fan units to outside of building unless authorized in writing by Designer.
6. Mount units to exhaust directly or through disposable ductwork.
7. Use only new ductwork except for sheet metal connections and elbows.
8. Use ductwork and fittings of same diameter or larger than discharge connection on fan unit.
9. Use inflatable, disposable plastic ductwork in lengths not greater than 100 feet (30 meters).
10. Use spiral wire-reinforced flex duct in lengths not greater than 50 feet (15 meters).
11. Arrange exhaust as required to inflate duct to a rigidity sufficient to prevent flapping.

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12. If direction of discharge from fan unit is not aligned with duct use sheet metal elbow to change direction. Use six feet (2 meters) of spiral wire reinforced flex duct after direction change.

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

1. Fabricate seal by first sealing door with duct tape and 6 mil polyethylene. Construct a barrier from 2" (13 mm) gypsum board supported by 3-5/8" (92 mm) x 25 gauge metal studs at 16" (410 mm) on centers. Space face of barrier a minimum of 3" (76 mm) from face of door. Seal barrier with 6 mil (0.15 mm) sheet plastic and duct tape.

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

2. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 inches (0.5 mm) of water higher in static pressure than any adjacent space.

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

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

1. Pressurize space with exhaust from HEPA filtered fan unit. Continuously maintain a pressure differential with this space a minimum of 0.02 (.5 mm) inches of water higher in static pressure than any adjacent work area.

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

1. Pressurize space with centrifugal-type fans. Axial type fans are not to be used for this purpose. Continuously maintain a pressure differential in this space a minimum of 0.02 inches (0.5 mm) of water higher in static pressure than any adjacent work area.

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

1. Wrap the duct with 6 mil (0.15 mm) polyethylene. Seal all polyethylene seams with spray glue and duct tape.

2. Enclose wrapped duct with two layers of polyethylene. Fabricate inner layer from 6 mil (0.15 mm) polyethylene with all seams sealed with spray glue and duct tape. Arrange outer layer to support inner layer. Fabricate out of reinforced sheet plastic with seams sealed with spray glue and duct tape and reinforced with staples. Support outer layer with a frame work fabricated from 2" x 4"s (51 mm x 102 mm) at 24" (610 mm) on center. Enclosures less than 2'-6' in diameter may be reinforced with box strapping in lieu of wood framing.

3.2 AUXILIARY GENERATOR

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

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3.3 AIR CIRCULATION IN THE WORK AREA:

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

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

C. **Determining the Air circulation Requirements:** The air flow volume (cubic meters per minute) exhausted (removed) from the workplace must exceed the amount of makeup air supplied to the enclosure. Provide a fully operational air circulation system supplying a minimum of the following air circulation rate:

1. 4 air changes per hour

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

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

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

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

3. Divide the air circulation requirement (CFM) ((LPS)) 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 (Liters / second) with fully loaded filters (pressure differential which causes loaded filter warning light to come on) in the machine's labeled operating characteristics.

4. Number of Units Needed =

$$\frac{\text{Air circulation Requirement (CFM) ((LPS))}}{\text{Capacity of Unit with Loaded Filters (CFM) ((LPS))}}$$

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

3.4 EXHAUST SYSTEM:

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

3. Exhaust all units from the Work Area to meet air circulation requirement of this section.
4. Location of HEPA Filtered Fan Units: Locate fan unit(s) so that makeup air enters work area primarily through decontamination facilities and traverses Work Area as much as possible. This may be accomplished by positioning the HEPA filtered fan unit(s) at a maximum distance from the worker access opening or other makeup air sources.
5. The end of the unit or its exhaust duct should be placed through an opening in the plastic barrier or wall covering. Seal plastic around the unit or duct with tape.
6. Vent to Outside of Building, unless authorized in writing by the Designer.
7. Air Handling Unit Exhaust: The exhaust plume from air handling units should be located away from adjacent personnel and intakes for HVAC systems.
8. Decontamination Units: Arrange Work Area and decontamination units so that the majority of make up air comes through the Decontamination Units. Use only personnel or equipment Decontamination Unit at any time and seal the other so that make up air passes through unit in use.
9. Supplemental Makeup Air Inlets: Provide where required for proper air flow through the Work Area in location approved by the Designer by making openings in the plastic sheeting that allow air from outside the building into the Work Area. Locate auxiliary makeup air inlets as far as possible from the fan unit(s) (e.g., on an opposite wall), off the floor (preferably near the ceiling), and away from barriers that separate the Work Area from occupied clean areas. Cover with flaps to reseal automatically if the pressure differential system should shut down for any reason. Spray flap and around opening with spray

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

3.5 RECIRCULATION SYSTEM:

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

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

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

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3.6 AIR CIRCULATION IN DECONTAMINATION UNITS:

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

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

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

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

C. **Air Movement:** Arrange air circulation through the Personnel Decontamination Unit so that it produces a movement of air from the Clean Room through the Shower Room into the Equipment Room. At each opening, the air flow velocity must be sufficient to provide visible indications of air movement into the work area.. The velocity of air flow within the enclosure must be adequate to remove airborne contamination from each worker's breathing zone without disturbing the asbestos-containing material on surfaces.

3.7 USE OF THE PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM:

A. **General:** Each unit shall be serviced by a dedicated minimum 115V-20A circuit with ground fault circuit interrupter (GFCI) supplied from temporary power supply installed under requirements of Section 01503 "Temporary Facilities." Do not use existing branch circuits to power fan units.

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

C. **Demonstrate Condition of Equipment** for each HEPA filtered fan unit and pressure differential monitoring equipment including proper operation of the following:
   14. Squareness of HEPA Filter
   15. Condition of Seals
   3. Proper operation of all lights
   16. Proper operation of automatic shut down if exhaust is blocked
   17. Proper operation of alarms
   18. Proper operation of Magnehelic gauge
   19. Proper operation and calibration on pressure monitoring equipment

D. **Demonstrate Operation** of the pressure differential system to the Designer will include, but not be limited to, the following:
   20. Plastic barriers and sheeting move lightly in toward Work Area,
   21. Curtain of decontamination units move lightly in toward Work Area,
   22. There is a noticeable movement of air through the Decontamination Unit.
   23. Use smoke tube to demonstrate air movement from Clean Room through Shower Room to Equipment Room.
   24. Use smoke tubes to demonstrate a definite motion of air across all areas in which work is to be performed.
   25. 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.
   26. Modify the Pressure Differential System as necessary to demonstrate successfully the above.

E. **Use of System During Abatement Operations:**
   27. Start fan units before beginning work (before any asbestos-containing material is disturbed). After abatement work has begun, run units continuously to maintain a constant pressure differential and air circulation until decontamination of the work area is complete. Do not turn off units at the end of the work shift or when abatement operations temporarily stop.
   28. Monitoring Pressure within the Enclosure: After the initial air flow patterns have been checked, the static pressure must be monitored within the enclosure. Monitoring may be

made using manometers, pressure gauges, or combinations of these devices. It is recommended that they be attached to alarms and strip chart recorders

29. Do not shut down air pressure differential system during encapsulating procedures, unless authorized by the Designer in writing. Supply sufficient pre-filters to allow frequent changes.
30. Start abatement work at a location farthest from the fan units and proceed toward them. If an electric power failure occurs, immediately stop all abatement work and do not resume until power is restored and fan units are operating again.
31. Corrective Actions: If the manometers or pressure gauges demonstrate a reduction in pressure differential below the required level, work should cease and the reason for the change investigated and appropriate changes made. The air flow patterns should be retested before work begins again.
32. At completion of abatement work, allow fan units to run as specified under section 01711, to remove airborne fibers that may have been generated during abatement work and cleanup and to purge the Work Area with clean makeup air. The units may be required to run for a longer time after decontamination, if dry or only partially wetted asbestos material was encountered during any abatement work.

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F. Dismantling the System:

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

END OF SECTION - 01513

01526
Temporary Enclosures

BrightFields, Inc.
Environmental Services

SECTION 01526 - TEMPORARY ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUBMITTALS:

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

1. Strippable Coatings: Submit following:
   a. Product description including major components and solvents.
   b. Test report on ASTM E84 test of surface burning characteristics.
   c. Manufacturer's installation instructions. Indicate portions applicable to the project and selected assemblies where the manufacturer offers alternatives.
2. Spray Cement: Submit following:
   a. Product description including major components and solvents.
   b. Manufacturer's installation instructions. Indicate portions applicable to the project.
3. Sheet Plastic: For fire retardant plastic submit test reports on NFPA 701 test.
4. Signs: Submit samples of signs to be used.

B. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been received - not reviewed.

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

PART 2 - PRODUCTS

2.1 SHEET PLASTIC:

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick , clear, frosted, or black as indicated.

B. **Polyethylene Sheet:** Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted or black as indicated.

C. **Reinforced Polyethylene Sheet:** Where plastic sheet constitutes the only barrier between the work area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame-resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.

2.2 STRIPPABLE COATINGS:

A. **Strippable Coatings:** Provide strippable coatings in aerosol cans or premixed for spray application formulated to adhere gently to surfaces and remove cleanly by peeling off at the completion of the work.
   1. Provide only water-based latex materials.
   2. Provide materials manufactured for the specific application required.

B. **Wall coating:** designed to be easy to remove.

C. **Floor coating:** designed to provide a tough film which resists spread of water beneath plastic layer.

D. **Window coating:** recommended by the manufacturer for use on windows. Supply materials that are designed to be stable on glass in sunlight and resist the transmission of ultraviolet radiation.

E. **Fire Safety:** Provide materials that meet the following requirements:
   1. When wet or while being installed:
      a. Do not create combustible vapors
      b. Have no flash point
      c. Are not noxious
      d. Department of Transportation category of non-flammable.
   2. When dry, material must have a Class A rating as a building material and meet the following requirements when tested in accordance with ASTM E-84:
      a. Flame Spread no greater than 20

b. Fuel Contributed 0
c. Smoke Developed no more than 110

F. **Deliver materials** to the job site in unopened, factory-labeled containers.

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

H. **Manufacturer:** Subject to compliance with requirements, provide products of one of the Following:

1. Isotek Corporation — Spray Poly
P.O. Box 29799
New Orleans, LA 70189-0799
(504)367-9856

2. H.B. Fuller Co. — Spray Poly
3900 Jackson St., NE — Part no. 3256
Minneapolis, MN 55421
(800) 328-4594

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2.3 MISCELLANEOUS MATERIALS:

A. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (50 mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

PART 3 - EXECUTION

3.1 SEQUENCE OF WORK:

A. **Carry out work of this section sequentially**. Complete each of the following activities in accordance with requirements before proceeding to the next.
   1. Provide emergency exits and emergency lighting.
   2. Control access
   3. Provide respiratory and worker protection.
   4. Provide Critical Barriers.
   5. Prepare Area.
   6. Provide Primary Barriers.
   7. Provide Isolation Areas as required.
   8. Provide Secondary Barrier.

3.2 GENERAL:

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

B. **Completely isolate the Work Area** from other parts of the building so as to prevent asbestos-containing dust or debris from passing beyond the isolated area. Should the area beyond the Work Area(s) become contaminated with asbestos-containing dust or debris as a consequence of the work, clean those areas in accordance with the procedures indicated in Section 01711. Perform all such required cleaning or decontamination at no additional cost to owner.

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

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

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

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

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

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

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

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

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

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

M. **Operating HVAC Systems in the regulated Area:** If components of a HVAC system located in the regulated area are connected to a system that will service another zone during the project, the portion of the duct in the regulated area must be sealed and pressurized. Necessary precautions include caulking the duct joints, covering all cracks and openings with two layers of sheeting, and pressurizing the duct throughout the duration of the project by restricting the return air flow. The power to the fan supplying the positive pressure should be locked "on" to prevent pressure loss.

1. If fan providing positive pressure fails for any reason, immediately stop asbestos removal work, mist the area to reduce airborne fiber levels. Notify the Project Administrator. Do not re-start asbestos removal work until authorized by the Designer.

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

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

notation "DANGER circuit being worked on". Lock panel and have all keys under control of authorized person who applied locks. If circuits cannot be shut down for any reason, label at intervals 4 feet (1.22 m) on center with signs reading, "DANGER live electric circuit. Electrocution hazard." Label circuits in hidden locations but which may be affected by the work in a similar manner.

P. **Inspection Windows:** Install inspection windows in locations shown on the plans or as directed by the Designer. Each inspection window is to have a 24 inch X 24 inch (610 X 610 mm) viewing area fabricated from 1/4 inch (6.35 mm) acrylic or polycarbonate sheet. Install window with top at 6 feet-6 inches (1.98 m) above floor height in a manner that provides unobstructed vision from outside to inside of the Work Area. Protect window from damage from scratching, dirt or any coatings used during the work. A sufficient number of windows are to be installed to provide observation of all portions of the Work Area that can be made visible from adjacent areas. Inspection windows that open into uncontrolled area are to be covered with a removable plywood hatch secured by lock and key. Provide keys to Designer for all such locks.

3.3 EMERGENCY EXITS:

A. **Provide emergency exits and emergency lighting** as set forth below:
   1. Emergency Exits: At each existing exit door from the Work Area provide the following means for emergency exiting:
   2. Arrange exit door so that it is secure from outside the Work area but permits exiting from the Work Area.
   3. Mark outline of door on Primary and Critical Barriers with luminescent paint at least 1 inch (25.4 mm) wide. Hang a razor knife on a string beside outline. Arrange Critical and Primary barriers so that they can be easily cut with one pass of razor knife. Paint words "EMERGENCY EXIT" inside outline with luminescent paint in letters at least one foot high and 2 inches (50.8 mm) wide.
   4. Provide lighted EXIT sign at each exit.
   5. Provide battery-operated emergency lighting that switches on automatically in the event of a power failure.

3.4 CONTROL ACCESS:

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

   1. Submit to Designer a list of doors and other openings that must be secured to isolate Work Area. Include on list notation if door or opening is in an indicated exit route.
   2. After receiving written authorization from the Designer lock all doors into Work Area, or, if doors cannot be locked, chain shut. Notify the local fire department of the list of doors/or other openings which must be chained or otherwise secured shut. Cover any signs that direct

emergency exiting, either outside or inside of Work Area, to locked doors. Do not obstruct doors required for emergency exits from Work Area or from building.

3. After receiving written authorization from the Designer, construct partitions or closures across any opening into Work Area. Partitions are to be a minimum of 8 feet (2.44 meters) high.
4. Fabricate partitions from 2 inch X 4 inch (50.8mm X 101.6mm) wood studs with 2 inch (1.27 cm) plywood on both faces. Brace at intervals of 4 feet (1.25 m) on center.
5. Modify elevator controls to prevent elevators from stopping at doors in Work Areas, when applicable. This work is to be performed by a qualified elevator technician.
6. Replace passage sets on doors required for exiting from Work Area with temporary locksets for duration of the project. Use entry type locksets that are key lockable from one side and always operable from inside. Install locksets with key side in stair tower and escape side on Work Area side. Provide one key to Owner and maintain one key in clean room of decontamination unit. After meeting Contractor release criteria set forth in Section 01711 Project Decontamination, reinstall original passage sets and adjust for proper operation.

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

1. Install temporary doors with entrance type locksets that are key lockable from the outside and always unlocked and operable from the inside. Do not use deadbolts or padlocks.
2. Replace locksets or passage sets on doors leading to decontamination units with temporary locksets for duration of the project. Remove any deadbolts or padlocks. Use entry type locksets that are key lockable from outside and always unlocked and operable from inside. After meeting contractor release criteria set forth in Section 01711 Project Decontamination reinstall original locks, passage sets and locksets and adjust for proper operation.
3. Provide one key for each door to Owner, and Designer and maintain one key in clean room of decontamination unit (3 total).

C. **Visual Barrier:** Where the Work Area is immediately adjacent to or within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that the work procedures are not visible to building occupants. Where this visual barrier would block natural light, substitute frosted or woven rip-stop sheet plastic in locations approved by the Designer.

D. **Access.** Limit access to regulated areas to authorized persons as defined by OSHA, and to the Owner, Designer, Project Administrator or a representative authorized by one of these entities.

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

1. Print text in both English and Spanish

Legend	**Notation**
KEEP OUT	3 inch (77 mm) Sans Serif Gothic or Block
BEYOND THIS POINT	1 inch (25.4 mm) Sans Serif Gothic or Block

ASBESTOS ABATEMENT WORK	1 inch (25.4 mm) Sans Serif Gothic or Block
IN PROGRESS	1 inch (25.4 mm) Sans Serif Gothic or Block
BREATHING ASBESTOS DUST MAY BE HAZARDOUS TO YOUR HEALTH	14 Point Gothic

2. Place immediately inside door and outside critical barriers post an approximately 20 inch by 14 inch (508 mm X 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend

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

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

3.5 ALTERNATE METHODS OF ENCLOSURE:

A. **Alternate methods** of containing the Work Area may be submitted to the Designer for approval in accordance with procedures set forth in Section 01632 Substitutions. Do not proceed with any such method(s) without prior written approval of the Designer.

B. **Notification:** Before work which involves the removal of more than 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of thermal system insulation or surfacing material is begun using an alternative method which has been the subject of required evaluation and certification. Send a copy of such evaluation and certification to the national office of OSHA, Office of Technical Support, Room N3653, 200 Constitution Avenue, NW, Washington, DC 20210 and to the Designer.

C. **Use a control method** that encloses, contains or isolates the processes or source of airborne asbestos dust, or otherwise captures or redirects such dust before it enters the breathing zone of employees.

D. **Certification:** Submit a certification from a certified industrial hygienist (CIH) or licensed professional engineer who is also qualified as a project designer, who has evaluated the work area, the projected work practices and the engineering controls and who certifies in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs and any requirements of Section 01562 ARespiratory Protection≅under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the

regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule issued under AHERA, or perimeter monitoring which meets the criteria of OSHA 1926.1101, and as determined in accordance with the portion of Section 01013 ASummary of Work - Asbestos Abatement≅ that describes the Owner=s monitoring of the project.

3.6 RESPIRATORY AND WORKER PROTECTION:

A. **Before proceeding** beyond this point in providing Temporary Enclosures:
   2. Provide Worker Protection per Section 01560
   3. Provide Respiratory Protection per Section 01562
   4. Provide Personnel Decontamination Unit per Section 01563

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3.7 CRITICAL BARRIERS:

A. **Completely Separate** the Work Area from other portions of the building, and the outside by closing all openings with sheet plastic barriers at least 6 mil (0.15 mm) in thickness, or by sealing cracks leading out of Work Area with duct tape.

B. **Individually seal** all ventilation openings (supply and exhaust), lighting fixtures, clocks, doorways, windows, convectors and speakers, and other openings into the Work Area with duct tape alone or with polyethylene sheeting at least 6 mil (0.15 mm) in thickness, taped securely in place with duct tape. Maintain seal until all work including Project Decontamination is completed. Take care in sealing of lighting fixtures to avoid melting or burning of sheeting.

C. **Provide Sheet Plastic** barriers at least 6 mil (0.15 mm) in thickness as required to seal openings completely from the Work Area into adjacent areas. Seal the perimeter of all sheet plastic barriers with duct tape or spray cement.

D. **Mechanically Support** sheet plastic independently of duct tape or spray cement seals so that seals do not support the weight of the plastic. Following are acceptable methods of supporting sheet plastic barriers. Alternative support methods may be used if approved in writing by the Designer.

   5. Plywood squares 6 inch x 6 inch x 3/8 inch (152 mm x 152 mm x 9.53mm) held in place with one 6d smooth masonry nail or electro-galvanized common nail driven through center of the plywood and duct tape on plastic so that plywood clamps plastic to the wall. Locate plywood squares at each end, corner and at maximum 4 feet (1.22 m) on centers.

   6. Nylon or polypropylene rope or wire with a maximum unsupported span of 10 feet (3.05 m), minimum 1/4 inch (6.35 mm) in diameter suspended between supports securely fastened on either side of opening at maximum 1 foot (304.8 mm) below ceiling. Tighten rope so that it has 2 inches (50.8 mm) maximum dip. Drape plastic over rope from outside Work Area so that a two foot long flap of plastic extends over rope into Work Area. Staple or wire plastic to itself 1 inch (25.4 mm) below rope at

maximum 6 inches (152 mm) on centers to form a sheath over rope. Lift flap and seal to ceiling with duct tape or spray cement. Seal loop at bottom of flap with duct tape. Erect entire assembly so that it hangs vertically without a "shelf" upon which debris could collect.

E. **Provide Pressure Differential System** per Section 01513.

7. Clean housings and ducts of all overspray materials prior to erection of any Critical Barrier that will restrict access.

3.8 PREPARE AREA:

A. **Scaffolding:** If fixed scaffolding is to be used to provide access HEPA vacuum and wet clean area prior to scaffolding installation.

B. **Remove all electrical and mechanical items,** such as lighting fixtures, clocks, diffusers, registers, escutcheon plates, etc. which cover any part of the surface to be worked on with the work.

C. **Remove all general construction items** such as cabinets, casework, door and window trim, moldings, ceilings, trim, etc., which cover the surface of the work as required to prevent interference with the work. Clean, decontaminate and reinstall all such materials, upon completion of all removal work with materials, finishes, and workmanship to match existing installations before start of work.

D. **Clean all contaminated furniture**, equipment, and or supplies with a HEPA filtered vacuum cleaner or by wet cleaning, as specified in Section 01712 Cleaning and Decontamination Procedures, prior to being moved or covered. All equipment furniture, etc. is to be deemed contaminated unless specifically declared as uncontaminated on the drawings or in writing by the Designer.

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

F. **Cleaning and Sealing Surfaces:** After cleaning with water and a HEPA vacuum, surfaces of stationary objects should be covered with two layers of plastic sheeting. The sheeting should be secured with duct tape or an equivalent method to provide a tight seal around the object.

3.9 PRIMARY BARRIER:

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

1. Sealing Elevators: If an elevator shaft is located in the regulated area, it should be either shut down or isolated by sealing with two layers of plastic sheeting. The sheeting should provide enough slack to accommodate the pressure changes in the shaft without breaking the air-tight seal.

2 Sheet Plastic: Protect surfaces in the Work Area with two (2) layers of plastic sheeting on floor and walls, or as otherwise directed on the Contract Drawings or in writing by the Designer. Perform work in the following sequence.

a. All seams in the sheeting should overlap, be staggered and not be located at corners or wall-to-floor joints.

b. Cover Floor of Work Area with 2 individual layers of clear polyethylene sheeting, each at least 6 mil (0.15 mm) in thickness, turned up walls at least 12 inches (305 mm). Form a sharp right angle bend at junction of floor and wall so that there is no radius which could be stepped on causing the wall attachment to be pulled loose. Both spray-glue and duct tape all seams in floor covering. Locate seams in top layer six feet from, or at right angles to, seams in bottom layer. Install sheeting so that top layer can be removed independently of bottom layer.

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c. Cover Carpeting with three (3) layers of polyethylene sheeting at least 6 mil (0.15 mm) in thickness. Place corrugated cardboard sheets between the top and middle layers of polyethylene.

d. Cover Sheet Plastic in areas where scaffolding is to be used with a single layer of 2 inch (13 mm) CDX plywood or 1/4 inch (6.5 mm) tempered hardboard. Wrap edges and corners of each sheet with duct tape. At completion of abatement work wrap plywood or hardboard with 2 layers of 6 mil (0.15 mm) polyethylene and move to next Work Area or dispose of as an asbestos-contaminated waste material in accordance with section 02084 of this specification.

e. Cover all walls in Work Area including "Critical Barrier" sheet plastic barriers with one layer of polyethylene sheeting, at least 6 mil (0.15 mm) in thickness, mechanically supported and sealed with duct tape or spray-glue in the same manner as "Critical Barrier" sheet plastic barriers. Tape all joints including the joining with the floor covering with duct tape or as otherwise indicated on the Contract Documents or in writing by the Designer.

f. Elevator: Cover walls, floor and ceiling of elevator with 2 layers of 6 mil (0.15 mm) polyethylene. Arrange entry to Work Area so that elevator door is in a positively pressurized space outside the clean room of the decontamination unit. At completion of work clean elevator as set forth in Section 01711. Refer to Section 01013 Summary of the Work for additional requirements for protection of elevator.

g. Stairs and Ramps: Do not cover stairs or ramps with unsecured sheet plastic. Where stairs or ramps are covered with plastic, provide 3/4 inch (19.1 mm) exterior grade

plywood treads securely held in place, over plastic. Do not cover rungs or rails with any type of protective materials.

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

3.10 ISOLATION AREA:

A. **Maintain isolation areas** between the Work Area and adjacent building area:

8 In locations shown on the plans.

9 In unoccupied rooms located between Work Area and adjacent occupied portions of the building.

10 In locations where separation between Work Area and occupied portions of building is formed by sheet plastic and/or temporary barriers.

11 Floor below Work Area.

B. **Form isolation area** by controlling access to the space in the same manner as a Work Area. Physically isolate the space from the Work Area and adjacent areas. Accomplish physical isolation by:

12 Installing critical barriers in unoccupied space.

13 Erecting a second Critical Barrier a minimum of 3 feet (1.0 m) away from Work Area.

3.11 STOP WORK:

A. **If the Critical or Primary barrier falls** or is breached in any manner stop asbestos removal work immediately and comply with **Stop Work** requirements of Section 01013 Summary of Work - Asbestos Abatement. Do not start work until authorized in writing by the Designer.

3.12 EXTENSION OF WORK AREA:

A. **Extension of Work Area:** If the Critical Barrier is breached in any manner that could allow the passage of asbestos debris or airborne fibers, then add affected area to the Work Area, enclose it as required by this Section of the specification and decontaminate it as described in Section 01711 Project Decontamination.

3.13 SECONDARY BARRIER:

A. **Secondary layer** of plastic as a drop cloth to protect the primary layer from debris generated by the asbestos abatement work is specified in the appropriate work sections.

END OF SECTION - 01526

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01527
Regulated Areas

BrightFields, Inc.
Environmental Services

SECTION 01527 - REGULATED AREAS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. **Worker Protection:** is specified in Section 01561 AWorker Protection - Repair and Maintenance.

B. **Respiratory Protection:** is specified in Section 01562 ARespiratory Protection

C. **Wet Decontamination Facilities:** are described in Section 01563 ADecontamination Units.

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1.3 DESCRIPTION OF WORK:

A. Work of this section consists of preparing a Regulated Area for work of the following specification sections only. Do not use procedures set forth in this section in connection with any other work.

1. Section 01046 Cutting & Patching Asbestos Containing Materials
2. Section 01528 Entry Into Controlled Areas
3. Section 01529 Mini Enclosures and Glovebags
4. Section 01712 Cleaning and Decontamination Procedures
5. Section 02083 Disturbance of ACM During O&M Work
6. Section 09251 Gypsum Drywall - Asbestos Enclosures
7. Section 15254 Repair of Insulation and Lagging

1.4 SUBMITTALS

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

1. HEPA Filtered Vacuum Cleaners: Submit product data.

2. Signs: Submit samples of each type of sign to be used.

3. Warning Tape: Submit samples.

PART 2 - EQUIPMENT

2.1 PRODUCTS

A. HEPA Filter Vacuum Cleaners:

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

Nilfisk of America, Inc. 225 Great Valley Parkway Malvern, PA 19355 (800) 645-3475	HEPA filtered Vacuums
Minuteman International 111 South Route 53 Addison, IL 60101 (708) 627-6900	Minuteman HEPA Vacuums
Pullman-Holt (White) Corp. PO Box 16647 Tampa, FL 33617 (813) 645-3475	HEPA Filtered Vacuums

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B. Plastic Sheet:

1. Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick , clear, frosted, or black as indicated.

PART 3 - EXECUTION

3.1 SECURING WORK AREA:

A. **Secure work** area from access by occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area, by scheduling work for periods of time that the building in unoccupied, or by constructing temporary wood stud and plywood barriers.

3.2 DEMARCATION OF REGULATED AREA:

A. **Demarcation.** Demarcate the Regulated Area with a sheet plastic drop cloth, signs and barrier tape. Configure the regulated area in a manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos.

1. Drop Cloth: Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

2. Signs: Post warning signs that carry the following legends in both English and Spanish:

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

Legend	**Notation**
KEEP OUT	3 inch (76.2 mm)Block

   b. Second Sign: Immediately inside the locked door and outside the controlled area post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Example Legend:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

3. Barrier Tape: Where the controlled area is in a large area such as on part of a boiler room or open office area, delineate area with 3 inch (76.2 mm) wide polyethylene ribbon with the printed warning, "CAUTION ASBESTOS REMOVAL". Install this ribbon at between 3 and 4 feet (0.91 and 1.22 meters) above the floor.

3.3 SCHEDULING:

A. **Work may be carried out** during normal working hours in those areas which can be completely secured by lockable doors from access by building occupants and staff, and which have HVAC equipment that can be shut down and locked off. Otherwise, work is to be carried out after building occupants and cleaning staff have left.

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3.4 GENERAL PROCEDURES:

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

1. Setup and management of the controlled area is to be under the supervision of a OSHA Competent Person as described in Section 01043 Project Coordination - Asbestos Abatement

2. Before start of work comply with requirement for worker protection in section 01561, and respiratory protection in section 01562.

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

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

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

6. Cover floor in vicinity of Work Area and six (6) feet (1.82 meters) beyond, with 6 mil (0.15 mm) polyethylene drop sheet. Where work is adjacent to wall, extend drop sheet up wall and secure at ceiling with duct tape. This drop sheet demarcates the boundary of the Regulated Area.

7. Seal all openings, supply and exhaust vents, and convectors within ten (10) feet (3.05 meters) of the Work Area with 6 mil (0.15 mm) polyethylene sheeting secured and completely sealed with duct tape.

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

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

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

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

    b. Worker standing off the sheet HEPA vacuum thoroughly the worker standing on the sheet.

    c. Worker on the sheet thoroughly HEPA vacuum all surfaces of the plastic sheet, bags, and any other items on the sheet including the worker=s feet.

11. If moving to the next Work Area in the same secured area: Worker on the drop sheet is to don clean foot covers, placing each foot, in turn, off the sheet as the foot cover is put on. Remove clean foot covers at the next Work Area while standing on the sheet. Dispose of the used foot covers along with the plastic sheet at completion of work in that area. Do not reuse foot covers to move off the sheet.

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

13. Fold sheet and all its contents toward the center.

14. Place the sheet in a properly labeled disposal bag.

15. Neck down the bag and collapse it with the HEPA vacuum.

16. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.

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

B. **At completion of work** require all workers to complete wet decontamination procedures in accordance with Section 01560 Worker Protection - Asbestos-Abatement.

END OF SECTION - 01527

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01528
Entry into Controlled Areas

BrightFields, Inc.
Environmental Services

SECTION 01528 - ENTRY INTO CONTROLLED AREAS

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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A. **The provisions of this section apply** when entry is required into an area where such entry could cause contamination of portions of the building and/or where respiratory or other worker protection measures are required.

B. **Unless authorized in writing** by the Designer, the provisions of this section apply to only the following situations:

1. Entry into the space above a suspended ceiling where there is exposed friable asbestos-containing fire proofing, visible asbestos-containing debris, or other friable asbestos-containing surfacing material when the ceiling tiles in an area no greater than 6 feet by 12 feet (1.83 x 3.66 meters) area to be removed.

2. Entry through sealed access (access door, hatchway, locked door) into an area with friable asbestos-containing surfacing materials or visible debris.

C. **Worker Protection:** Use procedures of this section only where a negative exposure assessment has been made for these procedures. Historic airborne fiber data demonstrate that personal airborne fiber counts in the breathing zone of those performing the work can be continuously maintained at less than 0.1 fibers per cubic centimeter can be used as a part of this assessment.

D. **Area Protection:** Use procedures of this section only where historic airborne fiber data demonstrate that area samples in the work area can be continuously maintained at less than 0.01 fibers per cubic centimeter.

1.3 SUBMITTALS:

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

1. Historic Airborne Fiber Data: Submit airborne asbestos fiber count data from an independent air monitoring firm to demonstrate:

   a. The ability to perform work of this section while maintaining an airborne fiber count below 0.1 fibers per cubic centimeter in the breathing zone of the individual performing the work.

   b. The ability to perform work of this section while maintaining an airborne fiber count below 0.01 fibers per cubic centimeter in the work area.

2. Include the following data for each procedure required by the work:
   a. Date of measurements
   b. Operations monitored
   c. Sampling and analytical methods used and evidence of their accuracy
   d. Number, duration, and results of samples taken

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 REGULATED AREA:

A. **Prior to beginning work** in this area establish a regulated area as described in Section 01527 Regulated Areas.

3.2 ACCESS THROUGH SUSPENDED CEILINGS:

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A. **Remove acoustical panels** from ceiling suspension system using the following sequence:

1. Follow worker protection procedures including disposable coveralls and respirators required by Section 01560, and Section 01562.
2. Follow local area protection procedures of Section 01528. Spread layer of 6 mil (0.15 mm) polyethylene sheet on floor 6 feet (1.83 meters) further in extent than the size of the ceiling opening to be made.
3. HEPA vacuum around edges of all panels to be removed.
4. While holding nozzle of HEPA vacuum in vicinity slowly lift one edge of center ceiling panel. Immediately HEPA vacuum space at lifted edge. Lift entire panel straight up and HEPA vacuum all four sides.
5. Place panel on top of adjacent ceiling.
6. Place intake duct to HEPA Filtered Fan Unit per Section 01513 in space above ceiling and fasten in place. Operate machine continuously while ceiling is open.
7. Note that the operation of the HEPA vacuum is intended to clean the air in the location of the work. As such the nozzle should be kept above the ceiling as much as possible and the canister on the floor.
8. Climb to a position which permits access to the top of the ceiling adjacent to the removed panel.
9. Working in the space above the ceiling, HEPA vacuum both sides of the ceiling panel first removed and hand it down into a 6 mil (0.15 mm) polyethylene bag for storage.

10. Remove loose material hanging from the friable asbestos- containing material with the suction from the HEPA vacuum.

11. Pass wand of operating HEPA vacuum through air between asbestos-containing material and top of ceiling.

12. HEPA vacuum the tops of all ceiling panels which are in reach.

13. Carefully HEPA vacuum the crack between the suspension system and ceiling panels from the top for all ceiling panels within reach.

14. Remove ceiling panels as required while constantly HEPA vacuuming all four edges of panel and suspension system.

15. Working in space above ceiling HEPA vacuum both sides on each panel removed and hand each down into a 6 mil (0.15 mm) polyethylene bag which is labeled as set forth is Section 02084.

16. Maintain HEPA vacuum in operation with nozzle above ceiling and exhaust at floor for the entire time that the ceiling is open and work is being done above the ceiling.

17. When above-ceiling work is complete replace ceiling panels.

18. HEPA vacuum worker's head, arm, and shoulders before climbing down from ceiling.

19. HEPA vacuum ladder while climbing down.

20. While standing on plastic sheet thoroughly HEPA vacuum ladder and pass it to person standing off sheet.

3.3 ENTRY INTO CONTROLLED AREAS:

A. **Use same procedure as above** except that ceiling tiles do not need to be removed.

B. **If access is through a wall hatch or door**, duct tape floor sheet to wall or threshold.

C. **If access is into large area** such as crawl tunnel, comply with worker protection requirements but use HEPA vacuum only for work procedures in the area.

3.4 PERSONNEL DECONTAMINATION:

A. **At the end of all work** change to a clean disposable coverall and leaving respirator in place proceed to a remote shower and decontaminate as required by Section 01560 Worker Protection - Asbestos Abatement.

END OF SECTION - 01528

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01529
Mini Enclosures and Glove Bags

BrightFields, Inc.
Environmental Services

SECTION 01529 - MINI ENCLOSURES AND GLOVEBAGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF THE WORK:

A. **Work of this section** consists of preparing a Regulated Area for work for which there is no negative exposure assessment or that involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material. This is Class III OSHA work, and is limited in size to operations that generate small amounts of ACM, i.e., no more than can be contained in one standard (60 inch x 60 inch) glove or waste bag filled no more than 1/3 to 1/2 full.

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1.3 SUBMITTALS:

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

1. Surfactant: Submit product data, use instructions and recommendations from manufacturer of surfactant intended for use. Include data substantiating that material complies with requirements.
2. Removal Encapsulant: Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.
3. NESHAP Certification: Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet ACM to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).
4. Material Safety Data Sheet: Submit Material Safety Data Sheet, or equivalent, in accordance with the OSHA Hazard Communications Standard (29 CFR 1910.1200) for each surfactant and encapsulating material proposed for used. Submit in the same manner as product data. Submittal is for information purposes only. Submittal will not be reviewed by Designer.

5. Spray Cement: Submit following:

   a. Product description including major components and solvents

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

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

7. Glovebags: Submit product data.

8. HEPA Vacuums: Submit product data

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

10. Mini-enclosure: Provide shop drawing of mini-enclosure arrangement to used.

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

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

   a. Surfactants.

   b. Spray Cement.

   c. Encapsulants.

PART 2 - PRODUCTS

2.1 GLOVE BAGS:

A. **Glovebags:** Provide minimum 6 mil (0.15 mm) thick polyethylene, polyvinyl chloride or equivalent plastic sack, with a seamless bottom, and two sealed inward projecting long sleeved gloves or mittens, preprinted with same warning notice as a disposal bag, equipped with a pouch for storage of tools, with designated location for wand or HEPA vacuum wand. Glove bag is to be not more than 60 inches by 60 inches in size.

B. **Negative Pressure Glove Bag Systems:** Provide glovebags as specified above that are equipped for attachment to a HEPA vacuum, and that has a device to prevent the bag from collapsing during use.

C. **Negative Pressure Glove Box Systems:** Provide glove boxes constructed with rigid sides and made from metal or other material, equipped for attachment to a HEPA vacuum, which will not collapse during use, and which can withstand the weight of the ACM and water used during removal. Provide system equipped with:

1. An air filtration unit attached to the box
2. The box fitted with gloved apertures
3. An aperture at the base of the box to serve as a bagging outlet for waste ACM and water
4. Provide waste bags made of 6 mil (0.15 mm) thick plastic labeled as set forth in section 02084 ADisposal of Regulated Asbestos-Containing Material≅.
5. A HEPA filtration system (or HEPA vacuum)to maintain pressure barrier in box.

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2.2 SHEET PLASTIC:

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick , clear, frosted, or black as indicated.

B. **Reinforced Polyethylene Sheet:** Where plastic sheet constitutes the only barrier between the Work Area and the building exterior, provide translucent, nylon reinforced or woven polyethylene, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick , frosted or black as indicated.

2.3 MISCELLANEOUS MATERIALS:

A. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (51 mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

C. **Wetting Materials:** For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:

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

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

D. **Encapsulants** are specified in Section 09805.

E. **Garden Sprayer:** Provide a hand pump type pressure-can garden sprayer fabricated out of either metal or plastic, equipped with a metal wand at the end of a hose that can deliver a stream or spray of liquid under pressure.

PART 3 - EXECUTION

3.1 GENERAL:

A. **Before Start of Work:** Complete the following before start of work of this section:
   1. 01527 Regulated Areas

3.2 WORKER PROTECTION:

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

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3.3 GLOVE BAGS AND BOXES:

A. **Complete requirements** of the following:

   1. 01562 Respiratory Protection

   2. 01561 Worker Protection - Repair and Maintenance

B. **Glovebag:** Remove ACM inside a glove bag according to the following procedure:

   1. Use at least two persons to perform glovebag removals operations.

   2. Use each glovebag only once

   3. Do not move glovebag once it has been mounted in place.

   4. Do not use glovebag on surface whose temperature exceeds 150EF (65.6EC).
   5. Check materials adjacent to locations where glovebag will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6 mil (0.15 mm) plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove bag will be attached.

   6. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter) and allow additional so that the top of the glove bag will be clear of the pipe after installation.

   7. Place necessary tools into pouch located inside glove bag. This will usually include: bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-wetted cloth.

8. Place a strip of duct tape along both edges of the open top slit of glove bag for reinforcement.

9. Place the glove bag around section of pipe to be worked on and staple top together through reinforcing duct tape. Staple down sides approximately 6 inches so that top of the glove bag is clear of pipe. Seal top and sides with duct tape. Next, duct tape the ends of glove bag to pipe itself, where previously covered with plastic or duct tape.

10. Install glovebag so that it completely covers the circumference of pipe or other structures where the work is to be done.

11. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and re-test.

12. Insert wand from garden sprayer through water sleeve. Duct tape water sleeve tightly around the wand to prevent leakage.

13. Thoroughly wet material to be worked on with amended water or removal encapsulant and allow to soak in. Wet adequately to penetrate and soak material through to substrate.

14. One person places their hands into the long-sleeved gloves while the second person directs garden sprayer at the work.

15. Use bone saw, if required, to cut insulation at each end of the section to be removed. A bone saw is a serrated heavy gauge wire with ring-type handles at each end. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum.

16. Remove insulation using putty knives or other tools. Place pieces in bottom of bag without dropping.

17. Rinse all tools with water inside the bag and place back into pouch.

18. Using scrub brush, rags and water, scrub and wipe down the exposed pipe.

19. Thoroughly wash and wipe down interior of glovebag to a point below the location where the bag will be twisted and taped to seal waste in bottom of bag.

20. Remove water wand from water sleeve and attach the small nozzle from HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag.

21. Remove the vacuum nozzle, twist water sleeve closed and seal with duct tape.

22. From outside the bag, pull the tool pouch away from the bag. Place duct tape over twisted portion and then cut the tool bag from the glove bag, cutting through the twisted/taped section. Contaminated tools may then be placed directly into next glove bag without cleaning. Alternatively, tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard rags and scrub brush with asbestos waste.

23. With removed insulation in the bottom of the bag, twist the bag several times and tape it to seal material in the bottom during removal of the glove bag from the pipe.

24. Slip a 6 mil (0.15 mm) disposal bag over the glove bag (still attached to the pipe). Remove tape or cut bag and open the top of the glove bag and fold it down into disposal bag.

25. Clean all surfaces in the Work Area using disposable cloths wetted with water with surfactant or removal encapsulant added. When these surfaces have dried, clean with a HEPA filtered vacuum. Material adhered to a surface with removal encapsulant may require the application of additional removal encapsulant to facilitate cleaning.

26. Seal exposed ends of remaining pipe insulation in accordance with Section 15254.

27. Remove disposable suits and place these into bag with waste.

28. Collapse the bag with a HEPA vacuum twist top of bag, seal with at least 3 wraps of duct tape, bend over and seal again with at least 3 wraps of duct tape.

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C. **Negative Pressure Glove Bag Systems.** Remove ACM inside a negative pressure glove bag system according to the following procedure:

1. Use at least two persons to perform glovebag removals operations.

2. Use each glovebag only once

3. Do not move glovebag once it has been mounted in place.

4. Do not use glovebag on surface whose temperature exceeds 150EF (65.6EC).

5. Check materials adjacent to location where glovebag will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6 mil (0.15 mm) plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove bag will be attached.

6. Install glovebag so that it completely covers the circumference of pipe or other structure where the work is to be done.

7. Install device used to prevent collapse of bag by negative pressure.

8. Smoke-test Glovebags for leaks and seal any leaks prior to use.

9. Run HEPA vacuum cleaner or other device used to create a negative pressure in the bag continuously during the operation.

10. Prior to disposal, collapse glovebag by removing air within it using a HEPA vacuum.

11. Where system uses attached waste bag, connect waste bag to collection bag using hose or other material which will withstand pressure of ACM waste and water without losing its integrity.

    a. Use sliding valve or other device to separate waste bag from hose to ensure no exposure when waste bag is disconnected.

12. Where a separate waste bag is used along with a collection bag and waste bag is discarded after one use, the collection bag may be reused if rinsed clean with amended water before reuse.

D. **Negative Pressure Glove Box Systems:** Remove ACM inside a negative glove box system according to the following procedure:

1. Use at least two persons to perform the work.
2. Check materials adjacent to location where glovebox will be installed. Wrap damaged (broken lagging, hanging, etc.), loose or friable material in 2 layers of 6 mil (0.15 mm) plastic and "candy-stripe" with duct tape, or render material intact by some other method. Place one layer of duct tape around undamaged pipe at each location where the glove box will be attached.

3. Use system in accordance with manufacturer=s instructions.

4. Smoke test box prior to each use

5. Use a HEPA Vacuum or other negative pressure generator with HEPA filtration to create a negative pressure in system

6. Provide a back-up HEPA Vacuum on site at all times during operation of the system.

7. Use waste bags made of 6 mil (0.15 mm) thick plastic, double-bag before filling.

3.4 MINI-ENCLOSURES:

A. **A mini enclosure** is a small walk-in enclosure which accommodates no more than two persons. Provide a fabricated or job-made enclosure constructed of 6 mil (0.15 mm) plastic or equivalent. Place the enclosure under negative pressure by means of a HEPA filtered vacuum or similar HEPA filtered ventilation unit.

B. **Provide a remote personnel decontamination unit** meeting requirements of Section 01563 ADecontamination Units≅ for worker decontamination.

C. **Sequence of Work:** Before beginning work of this sub-section complete the following:
   1. Isolation of area in accordance with Section 01527 ARegulated Area.≅
   2. Construction of a personnel decontamination unit in accordance with Section 01563 Decontamination Units.

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D. **Work Room:** Construct Work Room in the same manner as a Primary Barrier fabricated from 6 mil (0.15 mm) sheet plastic. Arrange so that Primary Barrier provides both a Critical and Primary Barrier. Line walls and floor of Work Room with a continuous Secondary Barrier.

E. **Change Room:** Provide an approximately 3 feet by 3 feet (0.9 m x 0.9 m) Change Room, with additional space as required for storage, attached to each Work Room. Fabricate Change Room from 6 mil (0.15 mm) sheet plastic in the same manner as a Primary Barrier. Locate so that access to Work Area is though Change Room.

F. **Step Off Area:** Cover floor in front of entry to Change Room with one layer of 6 mil (0.15 mm) sheet plastic. Securely anchor sheet plastic to prevent slipping.

G. **Flapped Door Construction:** Provide flapped door as entry to Change Room and entry from Change Room to Work Room. Fabricate each flapped door from overlapping contacting layers of sheet plastic. Fasten each layer on the top and one side. Each flap is to be 3 inches (76 mm) longer than door opening. Reinforce free side and bottom of each sheet with duct tape. Alternate sides that are fastened on each layer. Form arrows pointing to entry side from duct tape on inside and outside of door.

H. **Signage:** At entry to Change Room post an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

Legend

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

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

I. **Complete requirements** of the following:

1. Section 01560 Worker Protection - Asbestos Abatement

2. Section 01562 Respiratory Protection

3. Section 01513 Temporary Pressure Differential & Air Circulation System: HEPA filtered vacuum cleaner with vacuum in space outside Mini-Enclosure may be used for compliance with this section. Provide a minimum of 8 air changes per hour in the Work Room.

J. **Testing:** The mini-enclosure shall be inspected for leaks and smoke tested to detect breaches, and breaches sealed.

K. **Entry to Work Room:** Require that any time a worker enter the Work Room the following procedure is followed.

1. Outside of Change Room remove all street clothes and don clean coveralls and respirator. A swim suit or second disposable suit may be worn beneath outer coveralls.

2. Enter Change Room be sure that entry is completely closed.

3. Enter Work Room be sure that entry is completely closed.

L. **Work Procedures:** Arrange work area within the mini-enclosure so that during use air movement is directed away from the worker=s breathing zone.

M. **Worker Decontamination:** Require that any time a worker leaves the mini-Enclosure the following procedure be followed.

1. Maintain a bucket of clean potable water in the Work Area. Do not amend with a wetting agent.

2. Remove contaminated suit inside the Work Area. Leave respirator in place.

3. Wash hands, face and surface of respirator with water and wet paper towels. Use caution to avoid breaking seal between respirator face-piece and face.

4. Proceed with respirator in place to Change Room.

5. Be sure that entry to Work Area is completely closed.

6. In Change Room don clean disposable suit leaving respirator in place.

7. Exit change room be sure that entry to Change Room is completely closed. Proceed to next Mini-Enclosure, or a remote shower.

8. At end of work day decontaminate fully in accordance with procedures in appropriate specification section describing Worker Protection.

N. **Material Decontamination:** Require that the following procedure be used in removing equipment and bagged debris from the Work Room.

1. Three workers are required. One in the Work Room, one in the Change Room, and one on Step Off Area.

2. Equipment and bagged debris are to be removed from the Mini-Enclosure in separate operations.

3. Worker in Work Room cleans equipment and bagged debris and hands one piece of equipment or one bag of debris at a time to worker in Change Room.

4. Worker in Change Room wet cleans each piece of equipment or bag and stores them in Change Room. Equipment is sealed completely in 6 mil (0.15 mm) sheet plastic in the Change Room.

5. When the amount of stored material in the Change Room becomes large enough that the worker cannot clean incoming material without contacting previously cleaned material the door between the Work and Clean Room is closed.

6. The worker in the Changing Room then passes each item into a new disposal bag held open in the doorway between the Changing Room and Step Off Area by the worker on the Step Off Area. The Worker on the Step Off Area places each bag in a sealed cart for transport to the load out area. No bags are to be stored outside of the Mini-Enclosure.

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7. All bags are to be transported through the building in clean sealed containers that have never been in a asbestos Work Area, Mini-Enclosure or decontamination unit.

O. **Mini-Enclosure Decontamination:** At completion of all work decontaminate the Work and Changing Rooms as set forth in Section 01711 Project Decontamination for non-friable materials.

END OF SECTION - 01529

01560
Worker Protection – Asbestos Abatement

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BrightFields, Inc.
Environmental Services

SECTION 01560 - WORKER PROTECTION - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Respiratory Protection:** is specified in Section 01562.

1.4 WORKER TRAINING:

A. **AHERA Accreditation:** All workers are to be accredited as Abatement Workers as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

C. **Training - Class I:** Train in accordance with 29 CFR 1926.1101. Provide training for all workers who will perform Class I operations that is the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

D. **Training - Class II Intact (Non-Friable):** Provide training for workers who will be performing Class II work involving only the removal and/or disturbance of one generic category of building material, such as roofing materials, flooring materials, siding materials or cement asbestos panels; which includes as a minimum the specific work practices and engineering controls which specifically relate to that category. Provide a course that includes "hands-on" training and takes at least 8 hours. Provide training that includes the elements set forth in 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63.

E. **Training - Class II Non-Intact (Friable):** Provide training for workers who will be performing Class II work on materials that are friable, or will become friable during the work that is the equivalent in curriculum, training method and length to the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

1.5 MEDICAL SURVEILLANCE:

A. **Provide a medical surveillance program** for all employees who are:

1. Engaged in Class I, II and III work for a combined total of 30 or more days per year or,

a. For the purposes of this paragraph, any day in which a worker engages in Class II or Class III work or a combination thereof for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in the OSHA standard (29 CFR 1926.1101) is not counted.

2. Are exposed at or above the permissible exposure limit or excursion limit or,

3. Before an employee can be assigned to work requiring use of a respirator.

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B. **Provide a medical surveillance program** and physicianəs opinion before a respirator is assigned as required by 29 CFR 1910.134 and 29 CFR 1926.103(e)(10) .

C. **Provide medical examination** that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individual's ability to work in environments capable of producing heat stress in the worker.

1.6 SUBMITTALS:

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

1. **AHERA Accreditation:** Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

3. **Certificate Worker Acknowledgment:** Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.

4. **Training Program:** Submit a course outline of the worker training course. Include date and time course was given, name and title of teacher.

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

   a. Name and Social Security Number

   b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

   c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

   d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

   e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure (29 CFR 1926.1101(m)).

   f. A legible typed version of the physician=s name, the physician=s signature, and date of examination.

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

PART 2 - EQUIPMENT

2.1 PROTECTIVE CLOTHING:

A. **General.** Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of TSI or surfacing ACM or PACM.

B. **Coveralls:** When needed provide cloth full-body coveralls and hats, require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment Room of the Personnel Decontamination Unit. Dispose of coverall as asbestos waste at completion of all work.

B. **Additional Protective Clothing:** Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.

C. **Cold Weather Gear:** Provide each worker with an insulated jacket, pants, gloves, and hat. Require that cold weather gear be removed in Equipment Room of Personnel Decontamination Unit. Dispose of cold weather gear as asbestos waste at completion of all work.

D. **Boots:** Provide work boots with non-skid soles, and where required by OSHA, foot protectives, for all workers. Provide boots at no cost to workers. Paint uppers of all boots red with waterproof enamel. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with ACM. Dispose of boots as asbestos-contaminated waste at the end of the work.

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

F. **Goggles:** Provide eye protection (goggles) as required by OSHA for all workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.

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

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2.2 ADDITIONAL PROTECTIVE EQUIPMENT:

A. Disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Owner, Designer, Project Administrator, and other authorized representatives who may inspect the job site. Provide six (6) complete coveralls per day.

PART 3 - EXECUTION

3.1 GENERAL:

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

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

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3.2 DECONTAMINATION PROCEDURES:

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

1. Type C Supplied Air or Powered Air-Purifying Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area:

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

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

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

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

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

   f. Carefully wash facepiece of respirator inside and out.

2. If using PAPR: shut down in the following sequence, first cap inlets to filter cartridges, then turn off blower unit (this sequence will help keep debris which has collected on the inlet

side of filter from dislodging and contaminating the outside of the unit). Thoroughly wash blower unit and hoses. Carefully wash battery pack with wet rag. Be extremely cautious of getting water in battery pack as this will short out and destroy battery.

a. Shower completely with soap and water.

b. Rinse thoroughly.

c. Rinse shower room walls and floor prior to exit.

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

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

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

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

c. Thoroughly wet body from neck down.

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

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

f. Dispose of wet filters from air purifying respirator.

g. Carefully wash facepiece of respirator inside and out.

h. Shower completely with soap and water.

i. Rinse thoroughly.

j. Rinse shower room walls and floor prior to exit.

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

B. Remote Shower: The procedures above are to be used if the decontamination facility is used as a remote shower. If a worker cannot gain direct access to the Equipment Room require that he enter Decontamination Unit and proceed directly through Shower Room to Equipment Room. Decontamination procedure is then completed as required above.

C. Within Work Area:

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

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3.3 CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT:

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

END OF SECTION - 01560

BrightFields, Inc.

01561
Worker Protection – Repair and Maintenance

BrightFields, Inc.
Environmental Services

SECTION 01561 - WORKER PROTECTION-REPAIR AND MAINTENANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **This section describes** the equipment and procedures for protecting workers against asbestos contamination and other workplace hazards, except for respiratory protection, where asbestos fibers are collected at the point of generation so that contamination of workers is unlikely.

B. **This section applies** only where the airborne fiber counts as measured in accordance with 29 CFR 1926.1101 are below 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) and the excursion limit of 1.0 f/cc.

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1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Respiratory Protection:** is specified in Section 01562.

B. **Worker Protection:** for asbestos abatement work where workers will be in areas that contain or may contain airborne fiber counts measured in accordance with 29 CFR 1926 above 0.1 fibers per cubic centimeter for an 8 hour Time Weighted Average (TWA) or above 1.0 fibers per cubic centimeter for a 30 minute Excursion Limit (EL) is specified in Section 01560.

1.4 DESCRIPTION OF REQUIREMENTS:

A. **Worker protection requirements** of this section are appropriate for asbestos maintenance and repair work. This differs from asbestos abatement in that the work is not performed in an asbestos-fiber-contaminated area. As such, the worker decontamination procedures are carried out with a HEPA-filtered vacuum cleaner rather than a shower facility.

B. **Requirements** of this section apply only when work is being performed in accordance with the limitations and requirements of the following sections of this specification:

1. 01527 Regulated Areas

2. 01528 Entry Into Controlled Areas
3. 01529 Mini Enclosures and Glovebags for glovebag work.
4. 01712 Cleaning and Decontamination Procedures
5. 02083 Disturbance of ACM During O&M Work
6. 15254 Repair of Insulation and Lagging

C. **When the work** being performed is governed under any other specification section or required by any of the above sections or during work in a mini-enclosure the requirements of Section 01560 Worker Protection - Asbestos Abatement apply.

1.5 WORKER TRAINING:

A. **AHERA Accreditation:** All workers are to be accredited as required by the EPA Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

C. **Training:** Provide training in accordance with 29 CFR 1926.1101 for all workers that is the equivalent in curriculum and training method to that of the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers. [40 CFR 763.92(a)(2)]. Provide training that includes "hands-on" training in the use of respiratory protection and work practices and shall take at least 16 hours.

1.6 MEDICAL EXAMINATIONS:

A. **Provide a medical surveillance program** for all employees who are engaged in Class I, II and III work for a combined total of 30 or more days per year or are exposed at or above the permissible exposure limit or excursion limit. A medical exam also is required before an employee can be assigned to work requiring the use of a respirator.

1. For the purposes of this paragraph, any day in which a worker engages in Class II or Class III work or a combination thereof for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in the OSHA standard (29 CFR 1926.1101) is not counted.

B. **Provide a medical surveillance program** and physician=s opinion before a respirator is assigned as required by 29 CFR 1910.134 and 29 CFR 1926.103(e)(10).

C. **Provide medical examination** that as a minimum meets OSHA requirements as set forth in 29 CFR 1926.1101. In addition, require that the physician provide an evaluation of the individual=s ability to work in environments capable of producing heat stress in the worker.

1.7 SUBMITTALS:

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

1. **AHERA Accreditation:** Submit copies of certificates from an EPA-approved AHERA Abatement Workers course for each worker as evidence that each asbestos Abatement Worker is accredited as required by the EPA Interim Final Model Accreditation Plan (MAP) asbestos abatement worker training (40 CFR Part 763, Subpart E, Appendix C).

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

3. **Historic Airborne Fiber Data:** Submit airborne asbestos fiber count data from an independent air monitoring firm to verify that work procedures will result in an airborne fiber level as measured in accordance with 29 CFR 1926 below 0.1 fibers per cubic centimeter as an 8 hour Time Weighted Average (TWA). Include at least the following data for each procedure required by the work:

   a. Date of measurements

   b. Operation monitored

   c. Sampling and analytical methods used and evidence of their accuracy

   d. Number, duration, and results of samples taken

4. **Certificate Worker Acknowledgment:** Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or enter the Work Area.

5. **Training Program:** Submit a course outline of the worker training course. Include date and time course was given, name and title of teacher and attendance sheet listing all attendees of the course. Submittal shall be in the form of a letter signed and dated by the course teacher.

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

   a. Name and Social Security Number

   b. The physician's written opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

   c. Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and

   d. A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.

   e. A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.

   f. A legible typed version of the physician=s name, the physician=s signature, and date of examination.

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

PART 2 - EQUIPMENT

2.1 PROTECTIVE CLOTHING:

A. **General.** Provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit prescribed by 29 CFR 1926.1101 or for which a required negative exposure assessment is not produced, and for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet (7.5 linear meters or 3 square meters) of TSI or surfacing ACM or PACM.

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

C. **Coveralls:** Provide cloth full-body coveralls and hats, require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment Room of the Personnel Decontamination Unit. Dispose of coverall as asbestos waste at completion of all work.

D. **Additional Protective Clothing:** Provide each worker with the protective clothing as required by Federal State and local regulations. This includes, but is not necessary limited by Hardhats, Cold weather gear, Glove, boots and goggles.

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PART 3 - EXECUTION

3.1 GENERAL:

A. **Work and Decontamination** procedures involve a person in the work area on the plastic sheet and one off the sheet. The person on the sheet carries out the work and never leaves the sheet until the work is complete and dry decontamination procedures are completed. The person off the sheet supplies materials to and accepts material from the on-sheet person. The off sheet person never enters the Work Area. If the work involves more than one person then the team shall consist of two (or more) on-sheet persons and one off-sheet person.

B. **Do not eat, drink, smoke,** chew gum or tobacco, or apply cosmetics in the Work Area. To eat, drink, chew, or smoke, workers shall follow the procedures described below and leave the Work Area.

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

3.2 AIR MONITORING:

A. **Monitor Air** as follows at all times that the work is going on:

1. **Personal Air Samples:** Collect a personal air sample on the on-sheet person at all times that work is being carried out. Collect samples at 2 liters per minute for the entire time that work is being carried out. Use cellulose ester filters with 0.8 to 1.2 micron pore size to collect samples.

2. **Area Samples:** Collect one area sample in each secure area during or at completion of the work. Collect a 600 - 3000 liter sample at a maximum pumping rate of 12 liters per minute. Use cellulose ester filters with 0.8 to 1.2 micron to collect samples.

B. **Transmit Samples** to Owner's testing laboratory for analysis. Owner will provide a copy of all air monitoring data to the Contractor.

3.3 RESPIRATORS:

A. **Instruct and train** each worker in proper respirator use and require that each worker always wear a respirator, properly fitted on the face, in the Work Area.

3.4 COVERALLS:

A. **At the Start of Each Work Shift:** Put on new disposable coveralls, new head covers, new footwear covers over street shoes, and put on a clean respirator.

B. **All workers shall wear** disposable, full-body coveralls and disposable head and footwear covers in the Work Area.

C. **Follow procedures** under "Dry Decontamination" whenever leaving a Work Area.

3.5 ADDITIONAL PROTECTIVE EQUIPMENT:

A. **At the work site** maintain 2 complete sets of protective equipment including disposable coveralls, head covers, and footwear covers for use by the Designer or the Owner.

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3.6 DECONTAMINATION PROCEDURES:

A. **Require all Workers** to adhere to the following personal decontamination procedures whenever they leave the Work Area or at end of work shift:

1. **Dry Decontamination:** Complete the following before leaving any Regulated Area.

   a. Each person HEPA vacuum thoroughly the other person. Use brush attachment on the HEPA vacuum.

   b. While still wearing respirator each person removes their paper suit, turning it inside out while removing it. Roll up suit and pack in hood.

   c. Place suits in a disposal bag.

   d. Suck air out of bag with HEPA vacuum.

   e. Twist the bag shut, bend over and seal with duct tape by wrapping around bag neck at least 3 times.

2. **End Of Shift:** Require that each worker decontaminate according to the following procedure at the end of the day work or before removing respiratory protection.

   a. Each person HEPA vacuum hands, hair, face, and respirator.

   b. Each person HEPA vacuum area of respirator seal to face on the other person.

c. Remove respirator and, HEPA vacuum face at respirator seal and all surfaces of the respirator. HEPA vacuum any parts of hair or head covered by respirator straps.

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

e. Wash respirator face piece inside and outside.

f. At completion of above, thoroughly wash face and hands with soap and water.

g. Require that each worker follow the wet decontamination procedures set forth in Section 01560 at the end of each days work before changing into street clothing.

3.7 CERTIFICATE OF WORKER'S ACKNOWLEDGMENT:

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

END OF SECTION - 01561

BrightFields, Inc.
Environmental Services

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME_____ DATE_____

PROJECT ADDRESS_____

CONTRACTOR'S NAME_____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

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Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These things are to have been done at no cost to you.

WEBSITE

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

EDIT THE FOLLOWING AS APPROPRIATE

COPY

TRAINING COURSE: You must have been trained at a course the equivalent in curriculum and training method to the 16-hour Operations and Maintenance course developed by EPA for maintenance and custodial workers who conduct activities that will result in the disturbance of ACM. [40 CFR 763.92(a)(2)]. This course must have included "hands-on" training in the use of respiratory protection and work practices and shall take at least 16 hours.

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

Signature_____Social Security No_____

Printed Name_____Witness_____

BrightFields, Inc.

01562
Respiratory Protection

BrightFields, Inc.
Environmental Services

SECTION 01562 - RESPIRATORY PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

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

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1.3 DEFINITIONS:

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

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

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

1.4 STANDARDS:

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

1. **OSHA** - U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards Section 29 CFR 1910.1001, Section 1910.134, and Section 29 CFR 1926.1101.
2. **CGA** - Compressed Gas Association, Inc., New York, Pamphlet G-7, "Compressed Air for Human Respiration", and Specification G-7.1 "Commodity Specification for Air".
3. **CSA** - Canadian Standard Association, Rexdal, Ontario, Standard Z180.1, "Compressed Breathing Air".
4. **ANSI** - American National Standard Practices for Respiratory Protection, ANSI Z88.2.
5. **NIOSH** - National Institute for Occupational Safety and Health
   - NIOSH Respirator Decision Logic (May 1987) DHHS/NIOSH Publication No. 87-108;
   - NIOSH/EPA, AA Guide to Respiratory Protection for the Asbestos Abatement Industry≅ EPA-560-OPTS-86-001 (September 1986);
   - 42 CFR 84, NIOSH Standard for Certification of Non-Powered Air Purifying Respirator filters;
   - 30 CFR 11, NIOSH - Certification of Respirators
6. **MSHA** - Mine Safety and Health Administration

1.5 SUBMITTALS:

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

1. **Product Data:** Submit manufacturer's product information for each component used, including NIOSH and MSHA Certifications for each component in an assembly and/or for entire assembly.
2. **System Diagram:** When a supplied air respiratory system is required by the work, submit drawing showing assembly of components into a complete supplied air respiratory system. Include diagram showing location of compressor, filter banks, backup air supply tanks, hose line connections in Work Area(s), routing of air lines to Work Area(s) from compressor.
3. **Operating Instruction:** Submit complete operating and maintenance instructions for all components and systems as a whole. Submittal is to be in bound manual form suitable for field use.
4. **Respiratory Protection Program:** Submit Contractor's written respiratory protection program manual as required by OSHA 1926.1101.
5. **Initial Exposure Assessment**: Submit level of respiratory protection intended for each operation required by the project. Base this selection on an AInitial Exposure Assessment≅

as required by OSHA 29 CFR 1926.1101. Submit information to support this "Initial Exposure Assessment≅ on the form included at the end of this Section.

a. Submit data from exposure monitoring for the PEL and EL from prior asbestos jobs within 12 months;
b. Submit monitoring and analysis that were performed in compliance with the OSHA asbestos standard in effect;
c. Submit data that was obtained under workplace conditions "closely resembling" those that will exist during the Work;
d. Submit data from past asbestos jobs where the type of asbestos abatement and other work, material, control methods, work practices, and environmental conditions closely resemble those that will exist during the Work;
e. Submit exposure date from prior asbestos jobs where the work that was conducted by employees whose training and experience are no more extensive than that of employees performing the current job;
f. Based on the exposure data from the previous asbestos jobs, select respiratory protection for the Work that will, to a high degree of certainty, prevent worker exposures (inside the respirator) that exceed the Permissible Exposure Limits (PEL) set forth in this Section of the specifications.

6. **Resume information:** Submit resume and information on training for individual monitoring the operation of supplied air respiratory systems. Submit training certifications where applicable.

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1.6 AIR QUALITY FOR SUPPLIED AIR RESPIRATORY SYSTEMS:

A. **Provide air** used for breathing in supplied air respiratory systems that meets or exceeds standards set for C.G.A. type 1 (Gaseous Air) Grade D:

1.7 ALLOWABLE CONTAMINANTS:

A. **Supply air** that has an asbestos concentration no greater than outside ambient conditions.

B. **Supply air** that meets the level of contaminants allowed according to the air quality standard specified.

C. **The following table** sets forth the quantity of any given contaminant allowed according to the referenced standards:

CONTAMINANT	CGA Type 1 (Gaseous Air) Grade D	Grade E	Grade H	CSA Z180.1
Carbon Monoxide, PPM/v	20	10	5	5
Carbon Dioxide, PPM/v	1000	500	500	500
Condensed Hydrocarbons, mg./cu. meter	5	5		1
Gaseous Hydrocarbons - as methane, PPM/v			10	25
Water Vapor - PPM/v	(1)	(1)	(1)	27
dewpoint	-50F	-50F	-50F	-63F
Objectionable Odors	None	None	None	None
Nitrogen Dioxide, PPM/v -	-	0.5	0.2	
Nitrous Oxide, PPM/v	-	-	-	5
Sulfur Dioxide, PPM/v	-	-	0.5	-
Halogenated solvents, PPM/v	-	-	1	-
Other gaseous contaminants	-	-	-	(2)
Inorganic particulates, mg./cu. meter	-	-	-	1

\- Indicates that the standard shows no limiting characteristics

(1) The CGA standards do not indicate a specific moisture limit when the ambient temperature is above freezing. However, since a moisture content no greater than a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint (66 PPM/v) is necessary for carbon monoxide elimination, the CO limits could not be met unless the air were dried to a -50 Degrees Fahrenheit (-45.56 Degrees Celsius) dewpoint or better.

(2) Maximum allowable content of trichlorotrifluoroethane, dichlorodifluoromethane, and chlorodifluoromethane is 2 PPM/v for each. Unlisted contaminants shall not exceed one-tenth of the Threshold Limit Values (TLV's) for Chemical Substances in Workroom air adopted by the American Conference of Governmental Industrial Hygienists (ACGIH).

1.8 DELIVERY:

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

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PART 2 - EQUIPMENT

2.1 AIR PURIFYING RESPIRATORS

A. **Respirator Bodies:** Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees Fahrenheit (0 degrees Celsius).

B. **Filter Cartridges:** Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with 42 CFR Part 84 and ANSI Z228.2. Also, additional cartridge sections may be added, if required, for solvents, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.

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

2.2 SUPPLIED AIR RESPIRATOR SYSTEMS:

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

B. **Facepiece and Hose:** Provide full facepiece and hose by same manufacturer that has been certified by NIOSH/MSHA as an approved Type "C" respirator assembly operating in pressure demand mode with a positive pressure facepiece.

C. **Auxiliary backup system:** In atmospheres which contain sufficient oxygen (greater than or equal to 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator equipped with an emergency back up HEPA filter.

D. **Escape air supply:** In atmospheres which are oxygen deficient (less than 19.5 percent oxygen) provide a pressure-demand full facepiece supplied air respirator incorporating an auxiliary self-contained breathing apparatus (SCBA) which automatically maintains an uninterrupted air supply in pressure demand mode with a positive pressure face piece.

E. **Backup air supply:** Provide a reservoir of compressed air located outside the Work Area which will automatically maintain a continuous uninterruptable source of air automatically available to each connected facepiece and hose assembly in the event of compressor shut-down, contamination of air delivered by compressor, power loss or other failure. Provide sufficient capacity in the back-up air supply to allow a minimum escape time of one-half hour times the number of connections available to the Work Area. Air requirement at each connection is the air requirement of the

respirators in use plus the air requirement of an average-sized adult male engaged in moderately strenuous activity.

F. **Warning device:** Provide a warning device that will operate independently of the building's power supply. Locate so that alarm is clearly audible above the noise level produced by equipment and work procedures in use, in all parts of the Work Area and at the compressor. Connect alarm to warn of:
1. Compressor shut down or other fault requiring use of backup air supply
2. Carbon Monoxide (CO) levels in excess of 5 PPM/V

G. **Carbon Monoxide (CO) Monitor:** Continuously monitor and record on a strip chart recorder Carbon Monoxide (CO) levels. Place monitors in the air line between compressor and back-up air supply and between backup air supply and workers. Connect monitors so that they also sound an alarm as specified under "Warning Devices".

H. **Compressor Shut Down:** Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sound if any of the following occur:
1. Carbon Monoxide (CO) concentrations exceed 5 PPM/v in the air line between the filter bank and backup air supply
2. Compressor temperature exceeds normal operating range

I. **Compressor Motor:** Provide a compressor driven by an electric motor. Do not use a gas or diesel engine to drive compressor. Insure that electrical supply available at the work site is adequate to energize motor.

J. **Compressor Location:** Locate compressor outside of building in location that will not impede access to the building, and that will not cause a nuisance by virtue of noise or fumes to occupied portions of the building.

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

L. **After-Cooler:** Provide an after-cooler at entry to filter system which is capable of reducing temperatures to outside ambient air temperatures.

M. **Self Contained Breathing Apparatus (SCBA):** Configure system to permit the recharging of 2 hour 2260 PSI (15.58 MPa) SCBA cylinders.

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PART 3 - EXECUTION

3.1 GENERAL:

A. **Respiratory Protection Program:** Comply with ANSI Z88.2 "Practices for Respiratory Protection" and OSHA 29 CFR 1910.314 and 1926.103.

B. **Require** that respirators be used in the following circumstances:
1. During all Class I asbestos jobs.
2. During all Class II work where the ACM is not removed in a substantially intact state,
3. During all Class II and III work which is not performed using wet methods.
4. During all Class II and III asbestos jobs where the employer does not produce a "negative exposure assessment".
5. During all Class III jobs where TSI or surfacing ACM or PACM is being disturbed.
6. During all Class IV work performed within regulated areas where employees performing other work are required to wear respirators.
7. During all work covered by this section where employees are exposed above the OSHA PEL (TWA, or excursion limit).
8. In emergencies. During emergencies where the airborne asbestos fiber concentration is not known, a self-contained breathing apparatus (SCBA) must be used.

C. **Require** that respiratory protection be used at all times that there is any possibility of disturbance of ACM whether intentional or accidental.

D. **Require** that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause airborne fibers until the area has been cleared for re-occupancy in accordance with Section 01711.

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

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

3.2 FIT TESTING:

A. **Initial Fitting:** Provide initial fitting of respiratory protection during a respiratory protection course of training set up and administered by a individual qualified to do fit testing. Fit types and sizes of respirator to be actually worn by each individual. Allow an individual to use only those respirators for which training and fit testing has been provided.

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

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

3.3 TYPE OF RESPIRATORY PROTECTION REQUIRED:

A. **General:** After reducing airborne asbestos levels to the lowest feasible level with engineering controls and work practices, provide respiratory protection as necessary to ensure that workers are not exposed to an airborne concentration of asbestos in excess of the Specified Permissible Exposure Limits (SPEL) set forth in this Section.

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B. **Level of Respiratory Protection:** Determine the proper level of respiratory protection by dividing the expected or actual airborne fiber count in the Work Area by the "protection factors" given below. The level of respiratory protection which supplies an airborne fiber level inside the respirator, at the breathing zone of the wearer, at or below the Specified Permissible Exposure Limits (PEL)set forth in this Section is the minimum level of protection allowed.

C. **Specific Respiratory Protection Requirements:** Provide respiratory protection as indicated below as a minimum requirement:

1. **Half-face Negative Pressure Air-Purifying Respirators:** Provide half-face negative pressure air-purifying respirators during installation of Critical or Primary Barriers or other activities where there has been an AInitial Exposure Assessment≅ that has determined that airborne asbestos fiber levels will not exceed 0.1 fiber per cubic centimeter (0.1 f/cc). Provide a PAPR where a half-face negative pressure air-purifying respirator is allowed to any worker who so requests.
2. **Powered Air-Purifying Respirators (PAPR):** Provide powered air-purifying respirators (PAPR) during removal of asbestos-containing thermal system insulation (TSI) or surfacing material where there has been an AInitial Exposure Assessment≅ that has determined that airborne asbestos fiber levels will not exceed 1.0 fiber per cubic centimeter (1.0 f/cc).
3. **Type "C" Supplied-air respirators:** full facepiece pressure demand supplied air respirators are to be used by all workers engaged in the removal of thermal system insulation (TSI) or surfacing materials, or demolition of pipes, structures, or equipment covered or insulated with asbestos, or in the removal or demolition of asbestos insulation or coverings, or any other activity which results in or may result in airborne asbestos fiber levels above 1.0 fibers per cubic centimeter (1.0 f/cc).

D. **Provide** a full facepiece supplied air respirator operated in the pressure demand mode equipped with an auxiliary positive pressure self-contained breathing apparatus for all workers within a regulated area where Class I work is being performed and for which an initial exposure assessment has not been produced. After an initial exposure assessment is made, use the level of respiratory

protection required by that assessment and requirements of this specification and the OSHA Asbestos Construction Standard 29 CFR 1926.1101.

3.4 SPECIFIED PERMISSIBLE EXPOSURE LIMITS (SPEL):

A. **Specified Permissible Exposure Limits (SPEL):** Ensure that no worker is exposed to an airborne concentration of asbestos in excess of the Time-Weighted Average (TWA) limit, and Excursion Limit (EL) set forth below.

4 **Time Weighted Average (TWA) limit** - Concentration of airborne asbestos fibers to which any worker may be exposed as an eight (8) hour time-weighted average (TWA) shall not exceed the following.

a. 0.1 fibers per cubic centimeter

5 **Excursion Limit (EL)** - Concentration of airborne asbestos fibers to which any worker may be exposed as averaged over a sampling period of thirty (30) minutes shall not exceed the following.

a. 1.0 fibers per cubic centimeter

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

6. Electron Microscopy: If Electron Microscopy is used to determine airborne fiber levels, only asbestos fibers will be enumerated, but fibers of any size detected by the testing of Section 01711 Project Decontamination will be counted.

3.5 RESPIRATORY PROTECTION FACTOR:

A. Respirator Type	Protection Factor
7. **Air purifying:** Negative pressure respirator High efficiency filter Half facepiece	10
8. **Air purifying:** Negative pressure respirator High efficiency filter Full facepiece	50

9.	**Powered Air Purifying (PAPR):** Positive pressure respirator High efficiency filter Half facepiece	50
10.	**Powered air-purifying respirator** equipped with high efficiency filters or any supplied air respirator operated in continuous flow mode. Full facepiece	1,000
11.	**Supplied air:** Positive pressure respirator Pressure demand or other positive pressure mode Full facepiece Equipped with an auxiliary HEPA cartridge or positive pressure Self-contained breathing apparatus (SCBA) for escape	1,000

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3.6 AIR PURIFYING RESPIRATORS:

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

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

should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

3.7 SUPPLIED AIR RESPIRATOR:

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

END OF SECTION - 01562

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01563
Decontamination Units

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BrightFields, Inc.
Environmental Services

SECTION 01563 - DECONTAMINATION UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **Provide separate Personnel and Equipment Decontamination facilities.** Require that the Personnel Decontamination Unit be the only means of ingress and egress for the Work Area. Require that all materials exit the Work Area through the Equipment Decontamination Unit.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Refer to Section 01503 Temporary Facilities** - Asbestos Abatement for electrical requirements and requirements relative to connection of decontamination facilities to building systems such as water, sewer, and electrical.

1.4 SUBMITTALS

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

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

2. Equipment Decontamination Unit: Provide shop drawing showing location and assembly of equipment decontamination units.

3. Shower Pan: Provide shop drawing.

4. Shower Walls: Provide product data.

5. Shower Head and Controls: Provide product data.

6. Filters: Provide product data and shop drawing of installation on decontamination unit.
7. Hose Bib: Provide product data.

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

9. Lumber: Provide product data on fire resistance treatment.

90. Sump Pump: Provide product data.

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

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PART 2 - PRODUCTS

2.1 MATERIALS

A. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick , clear, frosted, or black as indicated.

B. **Polyethylene Sheet:** Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick , frosted or black as indicated.

C. **Reinforced Polyethylene Sheet:** Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick , frosted or black as indicated.

D. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (51mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

F. **Shower Pan:** Provide one piece waterproof shower pan 4 feet x 8 feet x 6 inches deep (102 mm X 204 mm x 152 mm deep). Fabricate from seamless fiberglass minimum 1/16 inch (1.59 mm) thick reinforced with wood, 18 ga. stainless or galvanized steel with welded seems, copper or lead with soldered seams, or a seamless liner of minimum 60 mil (1.5 mm) thick elastomeric membrane.

G. **Shower Walls:** Provide 8 feet (2.44 m) long by approximately 7 feet (2.13 m) high walls fabricated from rigid, impervious, waterproof material, either corrugated fiberglass roofing or equivalent. Structurally support as necessary for stability.

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

I. **Filters:** Provide cascaded filter units on drain lines from showers or any other water source carrying asbestos-contaminated water from the Work Area. Provide units with disposable filter elements as indicated below. Connect so that discharged water passes primary filter and output of primary filter passes through secondary filter.
   1. Primary Filter - Passes particles 20 microns and smaller

2. Secondary Filter - Passes particles 5 microns and smaller

J. **Hose Bib:** Provide heavy bronze angle type with wheel handle, vacuum breaker, and 3/4 inch (19.05 mm) National Standard male hose outlet.

K. **Shower Stall:** For Wash Down Station provide leak tight shower enclosure with integrated drain pan fabricated from fiberglass or other durable waterproof material, approximately 3 feet x 3 feet (0.91m x 0.91 m) square with minimum 6 feet (1.83 m) high sides and back. Structurally support as necessary for stability. Equip with hose bib, as specified in this section, mounted at approximately 4 feet (1.22 m) above drain pan. Connect drain to a reservoir, pump water from reservoir through filters to a drain or store and use for amended water. Mount filters inside shower stall on back wall beneath hose bib.

L. **Lumber:** Provide kiln dried lumber of any grade or species.

M. **Sump Pump:** Provide totally submersible waterproof sump pump with integral float switch. Provide unit sized to pump 2 times the flow capacity of all showers or hoses supplying water to the sump, through the filters specified herein when they are loaded to the extent that replacement is required. Provide unit capable of pumping debris, sand, plaster or other materials washed off during decontamination procedures without damage to mechanism of pump. Adjust float switch so that a minimum of 3 inch (76 mm) remains between top of liquid and top of sump pan.

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PART 3 - EXECUTION

3.1 PERSONNEL DECONTAMINATION UNIT:

A. **Provide a Personnel Decontamination Unit** consisting of a serial arrangement of connected rooms or spaces, Changing Room, Drying Room, Shower Room, Equipment Room. Require all persons without exception to pass through this Decontamination Unit for entry into and exiting from the Work Area for any purpose. Do not allow parallel routes for entry or exit. Do not remove equipment or materials through Personnel Decontamination Unit. Provide temporary lighting within Decontamination Units as necessary to reach a lighting level of 100 foot candles (1076 lumens / sq meter).

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

1. Construct using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness, to provide an airtight seal between the Changing Room and the rest of the building.

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

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

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

5. An existing room may be utilized as the Changing Room if it is suitably located and of a configuration whereby workers may enter the Changing Room directly from the Shower Room. Protect all surfaces of room with sheet plastic as set forth in Section 01526 Temporary Enclosures. Authorization for this must be obtained from the Designer in writing prior to start of construction. Submit written request in accordance with Section 01632 "Substitutions" detailing layout and protective measures proposed.

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

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

8. Provide posted information for all emergency phone numbers and procedures.

9. Provide 1 storage locker per employee.

10. Provide all other components indicated on the contract drawings.

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

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

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Drying and Changing Rooms with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

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

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

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Changing Room and Shower Room with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Separate from Changing Room by a sheet plastic flapped doorway.

5. Provide a continuously adequate supply of disposable bath towels.

6. Provide a rigid, tight-sealing hinged door between Drying Room and Clean Room. Arrange so that there is a sensible movement of air from clean room through breathing zone of worker in Shower and Drying Room toward Equipment Room.

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

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

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Drying Room and Airlock with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Provide splashproof entrances to Drying Room and Airlock with doors arranged in the following configuration:

   a. At each entrance to the Shower Room construct a door frame out of nominal 2 inch x 4 inch (51 mm X 102 mm) lumber with 1-1/2 inch (39 mm) jambs (sides) and 1-1/2 inch (39 mm) head (top) and sill (bottom). Attach to this door frame two overlapping flaps of elastomeric membrane material, fastened at the head (top) and jambs (sides) (by clamping between a 1-1/2 inch (39 mm) x 3/4 inch (19mm) batten and frame). Overlap the flaps a minimum of 6 inch (152 mm) in a direction that presents a shingle-like configuration to the water stream from the shower. Overlap sill (bottom) by 1-1/2 inch (39 mm) minimum. Arrange so that any air movement out of the Work Area will cause the flaps to seal against the door frame.

5. Provide shower head and controls.

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

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

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

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

10. Provide flexible hose shower head.

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

12. Provide hose bib.

13. Provide all other items indicated on contract drawings.

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

1. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

2. Separate this room from the Equipment Room and Shower Room with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate from Equipment Room by a sheet plastic flapped doorway.

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

1. Separate this room from the Work Area by a 6 mil (0.15 mm) polyethylene flapped doorway.

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Shower Room and Work Area with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

4. Provide a drop cloth layer of sheet plastic on floor in the Equipment Room for every shift change expected. Roll drop cloth layer of plastic from Equipment Room into Work Area after each shift change. Replace before next shift change. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

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

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

2. Separate this room from the rest of the building with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

3. Separate this room from the Equipment Room and Work Area with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

I. **Work Area:** Separate Work Area from the Equipment Room by polyethylene barriers. If the airborne asbestos level in the Work Area is expected to be high, as in dry removal, add an intermediate cleaning space between the Equipment Room and the Work Area. Damp wipe clean

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all surfaces after each shift change. Provide one additional floor layer of 6 mil (0.15 mm) polyethylene per shift change and remove contaminated layer after each shift.

J. **Decontamination Sequence:** Require that all workers adhere to the following sequence when entering or leaving the Work Area.

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

2. Any additional clothing and equipment left in Equipment Room needed by the worker are put on in the Equipment Room.

3. Worker proceeds to Work Area.

K. **Exiting Work Area:**

1. Before leaving the Work Area, require the worker to remove all gross contamination and debris from overalls and feet.

2. The worker then proceeds to the Equipment Room and removes all clothing except respiratory protection equipment.

3. Extra work clothing such as boots, hard hats, goggles, gloves are to be stored in contaminated end of the Equipment Room.

4. Disposable coveralls are placed in a bag for disposal with other material.

5. Require that Decontamination procedures found in Section 01560 be followed by all individuals leaving the Work Area.

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

3.2 EQUIPMENT DECONTAMINATION UNIT:

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

B. **Arrange with airlocks** between rooms as required below.

C. **Wash Down Station:** Provide an enclosed Shower Unit located in Work Area just outside Wash Room as an equipment, bag and container cleaning station.

1. Fabricate waterproof floor extending 6 feet (1.83 m) beyond Wash Down station in all directions. Install seamless waterproof membrane over area and extend over curbs on all four sides. Form curbs from 2 inch x 4 inch (51 X 102 mm) lumber laid on the flat.

2. Waterproof membrane is to be fabricated from minimum 10 mil (.254 mm) polyethylene.

3. Do not allow water to collect on waterproof membrane. Remove continuously with a wet vacuum or mops.

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

1. Construct wash room of nominal 2 inch x 4 inch (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that packaged materials, after being wiped clean, can be passed to the Holding Room.

2. Separate this room from the Work Area by a single flapped door of 6 mil (0.15 mm) polyethylene sheeting.

3. Provide a drop cloth layer of plastic on floor in the Wash Room for every load-out operation. Roll this drop cloth layer of plastic from Wash Room into Work Area after each load-out. Provide a minimum of two (2) layers of plastic at all times. Use only clear plastic to cover floors.

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

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

2. Separate this room from the rest of the building and adjacent spaces with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

F. **Holding Room:** Provide Holding Room as a drop location for bagged asbestos-containing materials passed from the Wash Room. Construct Holding Room of nominal 2 inch x 4 inch (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness and located so that bagged materials cannot be passed from the Wash Room through the Holding Room to the Clean Room.

1. Separate this room from the adjacent rooms by flap doors fabricated from 6 mil (0.15 mm) sheet plastic.

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G. **Airlock:** Provide an airlock between Holding Room and Clean Room. This is a transit area.

1. Separate this room from adjacent spaces by a sheet plastic flap doorway.

2. Separate this room from the rest of the building and adjacent spaces with airtight walls fabricated of 6 mil (0.15 mm) polyethylene.

H. **Clean Room:** provide Clean Room to isolate the Holding Room from the building exterior. If possible locate to provide direct access to the Holding Room from the building exterior.

1. Erect Critical and Primary Barriers as described in Section 01526 "Temporary Enclosures" in an existing space. If no space exists construct Clean Room of 2 x 4 (51 X 102 mm) wood framing and polyethylene sheeting, at least 6 mil (0.15 mm) in thickness.

2. Separate this room from the exterior by a single flap door of 6 mil (0.15 mm) polyethylene sheeting.

I. **Load-out Area:** The load-out area is the transfer area from the building to a truck or dumpster. It may be the Clean Room of the Equipment Decontamination unit or a separate room or loading dock area. Erect Critical and Primary barriers as described in Section 01526 "Temporary Enclosures" in load-out area.

1. During transfer of material from load-out area erect primary barriers as described in Section 01526 "Temporary Enclosures" as necessary to seal path from load-out area to truck or dumpster.

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

2. At washdown station, thoroughly wet clean contaminated equipment or sealed polyethylene bags and pass into Wash Room.

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

4. Once inside the washroom, wet clean the bags and/or equipment.

5. When cleaning is complete pass items into Holding Room. Close all doorways except the doorway between the Holding room and the Clean Room.

6. Workers from the building exterior enter Holding Area and remove decontaminated equipment and/or containers for disposal.

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

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

3.3 CONSTRUCTION OF THE DECONTAMINATION UNITS:

A. **Walls and Ceiling:** Construct airtight walls and ceiling using polyethylene sheeting, at least 6 mil (0.15 mm) in thickness. Attach to existing building components or a temporary framework.

B. **Floors:** Use 2 layers (minimum) of 6 mil (0.15 mm) polyethylene sheeting to cover floors in all areas of the Decontamination Units. Use only clear plastic to cover floors.

C. **Flap Doors:** Fabricated from three (3) overlapping sheets with openings a minimum of three feet (3') (0.91 meters) wide. Configure so that sheeting overlaps adjacent surfaces. Weights at bottom of sheets as required so that they quickly close after being released. Put arrows on sheets to indicate direction of overlap and/or travel. Provide a minimum of six feet (6') (1.22 meters) between entrance and exit of any room. Provide a minimum of three feet (3') (0.91 meters) between doors to airlocks.

D. **If the Decontamination area** is located within an area containing friable asbestos on overhead ceilings, ducts, piping, etc., provide the area with a minimum 1/4 inch (6.4 mm) hardboard or 1/2 inch (12.7 mm) plywood "ceiling" with polyethylene sheeting, at least 6 mil (0.15 mm) in thickness covering the top of the "ceiling".

E. **Visual Barrier:** Where the Decontamination area is immediately adjacent to and within view of occupied areas, provide a visual barrier of opaque polyethylene sheeting at least 6 mil (0.15 mm) in thickness so that worker privacy is maintained and work procedures are not visible to building occupants. Where the area adjacent to the Decontamination area is accessible to the public, construct a solid barrier on the public side of the sheeting to protect the sheeting. Construct barrier with wood or metal studs covered with minimum 1/4 inch (6.4 mm) thick hardboard or 1/2 inch (12.7 mm) plywood. Where the solid barrier is provided, sheeting need not be opaque.

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

G. **Electrical:** Provide subpanel at Changing Room to accommodate all removal equipment. Power subpanel directly from a building electrical panel.

9. Connect all electrical branch circuits in Decontamination unit and particularly any pumps in shower room to a ground-fault circuit protection device.

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3.4 CLEANING OF DECONTAMINATION UNITS:

A. **Clean debris and residue** from inside of Decontamination Units on a daily basis or as otherwise indicated on Contract Drawings. Damp wipe or hose down all surfaces after each shift change. Clean debris from shower pans on a daily basis.

B. **If the Changing Room** of the Personnel Decontamination Unit becomes contaminated with asbestos-containing debris, abandon the entire Decontamination Unit and erect a new Decontamination Unit. Use the former Changing Room as an inner section of the new Equipment Room.

3.5 SIGNS:

A. **Post** an approximately 20 inch by 14 inch (508 mm x 356 mm) manufactured caution sign at each entrance to the Work Area displaying the following legend with letter sizes and styles of a visibility required by 29 CFR 1926:

10. Provide signs in both English and Spanish.

11. Legend:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

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

B. **Post** an approximately 10 inch by 14 (254 mm x 356 mm) inch manufactured sign at each entrance to each Work Area displaying the following legend with letter sizes and styles of a visibility at least equal to the following:

13. Provide signs in both English and Spanish.

14. Legend	Notation
NO FOOD, BEVERAGES OR TOBACCO PERMITTED	3/4 inch (19 mm) Block
ALL PERSONS SHALL DON PROTECTIVE CLOTHING (COVERINGS) BEFORE ENTERING THE WORK AREA	3/4 inch (19 mm) Block
ALL PERSONS SHALL SHOWER IMMEDIATELY AFTER LEAVING WORK AREA AND BEFORE ENTERING THE CHANGING AREA	3/4 inch (19 mm) Block

END OF SECTION - 01563

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01601
Materials and Equipment – Asbestos Abatement

BrightFields, Inc.
Environmental Services

SECTION 01601 - MATERIALS AND EQUIPMENT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

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

1. The Contractor's Construction Schedule is included under Section 01043 Coordination - Asbestos Abatement.

2. The Contractor's Schedule of Submittals is included under Section 01301 Submittals - Asbestos Abatement.

3. The applicability of industry standards to products specified is included under Section 01097 Reference Standards and Definitions - Asbestos Abatement.

4. The administrative procedures for handling requests for substitutions made after award of the Contract is included under Section 01632 Substitutions - Asbestos Abatement.

1.3 DEFINITIONS

A. **Definitions** used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

2. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

3. "Foreign Products" as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside the United States and its possessions. Products produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of, nor living within, the United States and its possessions are also considered to be foreign products.

4. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

5. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

Required submittals: A general listing of products requiring submittals is included at the end of Section 01301 "Submittals." This listing may not be complete. Submittal requirements are found in each specification section. Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

A. **Product List:** Prepare a list showing products specified in tabular form acceptable to the Owner=s representative. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Form: Prepare product list with information on each item tabulated under the following column headings:

   a. Related Specification Section number.

   b. Generic name used in Contract Documents.

   c. Proprietary name, model number, and similar designations.

   d. Manufacturer's name and address.

   e. Supplier's name and address.

f. Installer's name and address.

g. Projected delivery date or time span of delivery period.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of the completed product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.

5. Designer's Action: The Designer will respond in writing to Contractor within 2 weeks of receipt of the completed product list. No response within this period constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Owner=s representative's response will include a list of unacceptable product selections, containing a brief explanation of reasons for this action.

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1.5 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

5. The contractor is responsible for providing products and construction methods that are compatible with products and construction methods to be installed after completion of the work of this contract.

6. If a dispute arises between contractors over concurrently selectable, but incompatible products, the Designer will determine which products shall be retained and which are incompatible and must be replaced.

C. Foreign Product Limitations: Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:

1. No available domestic product complies with the Contract Documents.

2. Domestic products that comply with the Contract Documents are available only at prices or terms substantially higher than foreign products that comply with the Contract Documents.

D. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:

a. Name of product and manufacturer.

b. Model and serial number.

c. Capacity.

d. Speed.

e. Ratings.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.

2. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.

7. Store products subject to damage by the elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

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PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents and governing regulations govern product selection. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where Specifications name only a single product or manufacturer, provide the product indicated. No substitutions will be permitted.

2. Semiproprietary Specification Requirements: Where Specifications name 2 or more products or manufacturers, provide 1 of the products indicated. No substitutions will be permitted.

3. Compliance with Standards, Codes, and Regulations: Where Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. **Comply with manufacturer's instructions and recommendations** for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.

3.e Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

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END OF SECTION 01601

BrightFields, Inc.

01632
Product Substitutions – Asbestos Abatement

BrightFields, Inc.
Environmental Services

SECTION 01632 - SUBSTITUTIONS - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

DELETE ANY OF THE FOLLOWING THAT DO NOT APPLY:

1. **Division 1 Section Reference Standards and Definitions - Asbestos Abatement** specifies the applicability of industry standards to products specified.
2. **Division 1 Section Coordination - Asbestos Abatement** specifies requirements for submitting the Contractor's Construction Schedule.
3. **Division 1 Section Submittals - Asbestos Abatement** specifies requirements for submitting the Submittal Schedule.
4. **Division 1 Section AMaterials and Equipment - Asbestos Abatement** specifies requirements governing the Contractor's selection of products and product options.

1.3 DEFINITIONS

A. **Definitions** in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. **Substitutions:** Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period, and accepted by Addendum prior to award of the Contract, are included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
2. Revisions to the Contract Documents requested by the Owner or Designer.
3. Specified options of products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

A. **Substitution Request Submittal:** The Designer will consider requests for substitution if received within 60 days after commencement of the Work. Requests received more than 60 days after commencement of the Work may be considered or rejected at the discretion of the Designer.

1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for change-order proposals.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

    a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate contractors, that will be necessary to accommodate the proposed substitution.
    b. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements, such as performance, weight, size, durability, and visual effect.
    c. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
    d. Samples, where applicable or requested.
    e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    f. Cost information, including a proposal of the net change, if any in the Contract Sum.
    g. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.
    h. The Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

4. Designer's Action: If necessary, the Designer will request additional information or documentation for evaluation within one week of receipt of a request for substitution. The Designer will notify the Contractor of acceptance or rejection of the substitution within 2 weeks of receipt of the request, or one week of receipt of additional information or documentation, whichever is later. Acceptance will be in the form of a change order.
   a. Use the product specified if the Designer cannot make a decision on the use of a proposed substitute within the time allocated.

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PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. **Conditions:** The Designer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Designer. If the following conditions are not satisfied, the Designer will return the requests without action except to record noncompliance with these requirements.

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The request is timely, fully documented, and properly submitted.
4. The specified product or method of construction cannot be provided within the Contract Time.
5. The Designer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
6. The requested substitution offers the Owner a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Owner must assume. The Owner's additional responsibilities may include compensation to the Designer for redesign and evaluation services, increased cost of other construction by the Owner, and similar considerations.
7. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
9. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

B. **The Contractor's submittal** and the Designer's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01632

01701
Contract Closeout – Asbestos Abatement

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BrightFields, Inc.
Environmental Services

SECTION 01701 - CONTRACT CLOSEOUT - ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. **This Section includes** administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Submittal of warranties.
   4. Final cleaning.

B. **Closeout requirements** for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. **Preliminary Procedures:** Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

   1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
      a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
      b. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
   2. Advise the Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
7. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
8. Complete final cleanup requirements, including touch up painting.
9. Touch up and otherwise repair and restore marred, exposed finishes.

B. **Inspection Procedures:** On receipt of a request for inspection, the Designer will either proceed with inspection or advise the Contractor of unfilled requirements. The Designer will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Designer will repeat inspection when requested and assured that the Work is substantially complete.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

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1.4 FINAL ACCEPTANCE

A. **Preliminary Procedures:** Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Designer's final inspection list of items to be completed or corrected, endorsed and dated by the Designer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Designer.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.

7. Submit evidence of final, continuing insurance coverage complying with insurance requirements, at owner's request.

B. **Re-inspection Procedure:** The Designer will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Designer.
   1. Upon completion of re-inspection, the Designer will prepare a certificate of final acceptance. If the Work is incomplete, the Designer will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
   2. If necessary, re-inspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

A. **General:** Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Designer's reference during normal working hours.

B. **Record Drawings:** Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
   2. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
   3. Note related change-order numbers where applicable.
   4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. **Record Specifications:** Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.
   1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
   2. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
   3. Note related record drawing information and Product Data.
   4. Upon completion of the Work, submit record Specifications to the Designer for the Owner's records.

D. **Record Product Data:** Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.
3. Upon completion of markup, submit complete set of record Product Data to the Designer for the Owner's records.

E. **Miscellaneous Record Submittals:** Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Designer for the Owner's records.

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PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. **General:** The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls." The cleaning in this Section is in addition to cleaning which is part of decontamination work. This section is intended to return the facility to the Owner in presentable condition.

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

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

   a. Remove labels that are not permanent labels.
   b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials.
   c. Replace chipped or broken glass and other damaged transparent materials.
   d. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
   e. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
   f. Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C. **Removal of Protection:** Remove temporary protection and facilities installed for protection of the Work during construction.

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

1. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01701

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BrightFields, Inc.

01711
Project Decontamination

BrightFields, Inc.
Environmental Services

SECTION 01711 - PROJECT DECONTAMINATION

PART 1 - GENERAL

1.1 SUMMARY:

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

B. **Work of This Section** includes the cleaning, decontamination, and removal of temporary facilities installed prior to abatement work, including:
1. Primary and Critical Barriers erected by work of Section 01526
2. Decontamination Unit erected by work of Section 01563
3. Pressure Differential System installed by work of Section 01513

C. **Work of This Section** includes the cleaning, and decontamination of all surfaces (ceiling, walls, floor) of the Work Area, and all furniture or equipment in the Work Area.

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1.2 RELATED DOCUMENTS:

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

1.3 DESCRIPTION OF REQUIREMENTS:

A. **General:** Decontamination of the Work Area following asbestos abatement.

B. **If the asbestos abatement work is on damaged or friable materials** the work is a four step procedure with two cleanings of the Primary Barrier plastic prior to its removal and two cleanings of the room surfaces to remove any new or existing contamination. Unless specifically indicated otherwise all materials are considered damaged or friable for purposes of this section.

C. **If the asbestos abatement work is on undamaged and non-friable materials** the decontamination procedure is a two step procedure with two cleanings of the Primary Barrier plastic to remove contamination, thus preventing contamination of the building when the Work Area isolation barriers are removed.

D. **In both cases** operation of the pressure differential system is used to remove airborne fibers generated by the abatement work.

1.4 RELATED WORK SPECIFIED ELSEWHERE:

A. **Removal of Gross Debris** is integral with the performance of abatement work and as such is specified in the appropriate work section(s) of these specifications:

1. Section 02081 Removal of Asbestos-Containing Materials
2. Section 02082 Removal of Asbestos-Contaminated Soil
3. Section 09251Gypsum Drywall - Asbestos Enclosures
4. Section 09805 Encapsulation of Asbestos-Containing Materials

1.5 CLEARANCE AIR SAMPLING BY THE OWNER:

A. **To determine** if the elevated airborne asbestos structure concentration encountered during abatement operations has been reduced to the specified level, the Owner will secure samples and analyze them according to the following procedures.

1. Aggressive sampling procedures as described below will be followed.
2. PCM samples will be secured as indicated below.
3. If the project designer warrants TEM samples, they will be secured and analyzed as indicated below.
4. Work Area Clearance: upon meeting the PCM/TEM Clearance requirements the work of Section 01711 Project Decontamination can continue.
5. Aggressive sampling procedures as described below will be followed.
6. PCM/TEM samples will be secured as indicated below. PCM samples will be analyzed and TEM samples are warranted they will be transmitted to the laboratory.
7. Work Area Clearance: upon meeting the PCM/TEM Clearance requirements the work of Section 01711 Project Decontamination can continue.

1.6 AGGRESSIVE SAMPLING BY THE OWNER:

A. **All Air Samples** will be taken using aggressive sampling techniques as follows:

1. Before sampling pumps are started the exhaust from forced-air equipment (leaf blower with an approximately 1 horsepower (746 watts) electric motor) will be swept against all walls, ceilings, floors, ledges and other surfaces in the room. This procedure will be continued for 5 minutes per 10,000 (283 cubic meters) cubic feet of room volume.
2. One 20 inch (508 mm) diameter fan per 10,000 cubic feet (283 cubic meters) of room volume will be mounted in a central location at approximately 6 feet-6 inches (2 meters) above floor, directed toward ceiling and operated at low speed for the entire period of sample collection.

3. Air samples will be collected in areas subject to normal air circulation away from room corners, obstructed locations, and sites near windows, doors of vents.
4. After air sampling pumps have been shut off, fans will be shut off.
5. In work areas where a dirt floor or exposed fibrous glass insulation is in the space, but outside the work area, maintain a critical barrier to prevent disturbance of these surfaces during aggressive sampling.

1.7 SCHEDULE OF CLEARANCE AIR SAMPLES BY OWNER:

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

1. **PCM:** 0.8 micrometer mixed cellulose ester.

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

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

C. Sampling sensitivity:

1. **PCM:** Based on a limit of detection (LOD) of 7 fibers/mm^2 on the filter (approximately 5 fiber counted in 100 fields) and a 95% confidence limit, a sample volume of sufficient size that a single sample indicates compliance with the limit values given below. A sample must be at or below the LOD to indicate that it is at or below the limit value. Note: This is different from quantifying a concentration which is a stricter requirement and would need a larger sample volume.
   a. Clearance samples - a limit value of 0.01 f/cc.

2. **TEM:** Analytical Sensitivity as set forth in the analytical method used or the AHERA regulation.

D. PHASE CONTRAST MICROSCOPY:

1. **In each Work Area** after completion of all cleaning work, a minimum of 7 samples will be taken and analyzed as follows:

Location Sampled	Number of Samples	Limit Value (Fibers/cc)	Approx. Volume Liters / (Liters) Minute	Rate
Each Work Area or	5	0.01	*<1,000>*	10
Each Room of Work Area	1 (5 min.)	0.01	*<1,000>*	10
Work Area Blank	1	0.01	0	open for 30 Seconds
Laboratory Blank	1	0.01	0	Do Not Open

2. **Analysis:** Fibers on each filter will be measured using the NIOSH Method 7400 entitled "Fibers" published in the NIOSH Manual of Analytical Methods, or the OSHA Reference Method (ORM) (29 CFR 1926.1101 Appendix A).

3. **Fibers:** referred to in this section include fibers regardless of composition as counted by the phase contrast microscopy method used.

4. **Split Sample:** One Work Area sample will be split and both halves analyzed separately for duplicate analysis.

5. **Release Criteria:** Decontamination of the work site is complete when every Work Area sample is at or below the Detection Limit above. If any sample is above the Detection Limit then the decontamination is incomplete and recleaning per section 01711 Project Decontamination is required.

1.8 TRANSMISSION ELECTRON MICROSCOPY:

A. **In each Work Area** after completion of all cleaning work, a minimum of 13 samples will be taken and analyzed as follows:

Location Sampled	Number of Samples	Analytical Sensitivity Struct/cc	Approx. Volume (Liters)	Rate Liters/ Minute
Each Work Area	5	0.005	1,300-1,800	1-10
Outside Each Work Area	5	0.005	1,300-1,800	1-10
Work Area Blank	1	0.005	0	Open for 30 Seconds
Outside Blank	1	0.005	0	Open for 30 Seconds
Laboratory Blank	1	0.005	0	Do Not Open

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B. **Analysis** will be performed using the analysis method set forth in the AHERA Regulation 40 CFR Part 763 Appendix A.

C. **Asbestos Structures** referred to in this Section include asbestos fibers, bundles, clusters or matrices, as defined by method of analysis.

D. **Release Criteria:** Decontamination of the work site is complete if either of the following two sets of conditions are met:

1. **Work Area Samples are below filter background levels**

   a. All Work Area sample volumes are greater than 1,199 liters for a 25 mm. sampling cassette.

   b. The average concentration of asbestos of the five Work Area Samples does not exceed the filter background level of 70 structures per square millimeter of filter area.

2. **Work Area Samples are not statistically different from Outside samples**

   a. All sample volumes except for blanks are greater than 560 liters for a 25 mm. sampling cassette.

   b. The average asbestos concentration of the three blanks is below the filter background level of 70 structures per square millimeter of filter area.

c. Average asbestos concentrations in Work Area Samples are not statistically different from Outside samples, as determined by the Z-test calculation found in 40 CFR Part 763, Subpart E, Appendix A (Z is less that or equal to 1.65)

E. **If these conditions are not met** then the decontamination is incomplete, repeat the cleaning procedures of this section.

F. **Termination of Analysis:** if the arithmetic mean (average) asbestos concentration on the blank filters exceed 70 structures per square millimeter of filter area the analysis will cease and new samples collected.

1.9 LABORATORY TESTING BY THE OWNER:

A. **Phase Contrast Microscopy by the Owner:**

1. **The services of a testing laboratory** will be employed by the Owner to perform laboratory analysis of the air samples. A technician will be at the job site, and samples will be sent daily by overnight delivery, so that verbal reports on air samples can be obtained within 24 hours. A complete record, certified by the testing laboratory, of all air monitoring tests and results will be furnished to the Designer, the Owner and the Contractor.

B. **Transmission Electron Microscopy by the Owner:**

1. **Samples will be sent by overnight courier** for analysis by Transmission Electron Microscopy. Samples will not be carried on weekends, so that samples shipped on Friday will arrive on the following Monday. Verbal results will normally be available during the 5th working day after receipt of samples by the laboratory. The laboratory is capable of analyzing a maximum of 13 such samples from this project at any one time. All Transmission Electron Microscopy results will be available to the Contractor.

2. **Submit with bid unit cost** for each day of waiting beyond that set forth in the paragraph above.

1.10 SUBMITTALS:

A. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal is returned for Unrestricted Use or Final But Restricted Use.

1. Submit test report from an independent testing laboratory on the fire resistance rating of the assembly of the sprayback fireproofing on the lock-back sealer used.

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

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

   a. Lock-Back, sealer.

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PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 START OF WORK:

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

B. **Visual inspection:** Perform visual inspections of the work area along with the Project Administrator at each step of the decontamination process.

1. Follow inspection procedures in EPA Purple Book.

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

1. Primary Barrier: Two layers of polyethylene sheeting on floor and one layer on walls.
2. Critical Barrier: An airtight barrier between the Work Area and other portions of the building or the outside.
3. Critical Barrier Sheeting: Over lighting fixtures and clocks, ventilation openings, doorways, convectors, speakers and other openings.
4. Decontamination Units: For personnel and equipment in operating condition.
5. Pressure Differential System: In operation.

3.2 FIRST CLEANING:

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

1. Remove All Filters in Air Handling System(s) and dispose of as asbestos-containing waste in accordance with requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material.
2. After the surfaces have passed a visual inspection verifying that all debris and residue has been removed from the sheet plastic, allow a waiting period that is long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of work areas during this period. Maintain Pressure Differential System in operation for the entire 96 air change period.

3.3 SECOND CLEANING:

A. **Second Cleaning:** Carry out a second cleaning of all surfaces in the work area in the same manner as the first cleaning.

B. **Visual inspection:** Before the application of any sealer to abated surfaces as a lock-back, perform a visual inspection to determine if all ACM including debris and residue has been removed. Perform visual inspections along with Project Administrator. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Administrator. After this visual inspection is passed, lock-back sealants can be applied and the work area decontamination process can be initiated.

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C. **Sealing of substrate:** Perform sealing of substrate or installation of spray-applied finishes or fireproofing, where required, at this time. Maintain Pressure Differential System in operation during encapsulation work. Perform work only after meeting the following requirements:

3. Surfaces to be covered with sealer have met the requirements for a visual inspection in this section.

4. Airborne fiber counts in the Work Area are at or below 0.01 fibers per cubic centimeter as measured by phase contrast microscopy.

D. **Removal of Primary Barriers:**

5 Immediately following the second cleaning of the Primary plastic, remove all Primary Barrier sheeting and Material Decontamination Unit, if there is one, leaving only:

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

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

c. Decontamination Unit: For personnel, in operating condition.

d. Pressure Differential System: Maintain in continuous operation.

3.4 FINAL CLEANING:

A. **Final Cleaning:** Carry out a final cleaning of all surfaces in the Work Area in the same manner as the previous cleaning.

B. **Contractor's Testing:** At the completion of the above cleaning visually inspect all surfaces. Re-clean if any dust, debris, etc. is found. At completion of this inspection sweep entire Work Area including walls, ceilings, ledges, floors and other surfaces in the Work Area with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). Do not direct forced air equipment at any seal in any critical barrier. If any debris or dust is found

repeat the final cleaning. Continue this process until no debris dust or other material is found while sweeping of all surfaces with forced air equipment.

C. **After a visual inspection**, again wait for a period of time long enough for the HEPA-filtered fan units operating in the work area to provide 96 air changes to allow HEPA filtered fan units to clean air of airborne asbestos fibers. Use oscillating fans as necessary to assure circulation of air in all parts of Work Areas during this period. Maintain Pressure Differential System in operation for the entire 96 air change period.

3.4 VISUAL INSPECTION:

A. **After Final Cleaning Perform a Complete Visual Inspection** of the entire Work Area including: all surfaces, ceiling, walls, floor, decontamination unit, all plastic sheeting, seals over ventilation openings, doorways, windows, and other openings; look for debris from any source, residue on surfaces, dust or other matter. During visual inspection sweep entire work area including walls, ceilings, ledges, floors, and other surfaces in the room with exhaust from forced air equipment (leaf blower with approximately 1 horsepower electric motor or equivalent). If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, and if after sweeping of all surfaces with leaf blower, no debris, residue, dust or other material is found, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Administrator.

B. **Temporary lighting:** Provide a minimum of 100 foot candles (1075 Lumens / sq meter) of lighting on all surfaces in the areas to be subjected to visual inspection. Provide hand held lights providing 150 foot candles (1600 lumens / sq meter) at 4 feet (1.25 meter) capable of reaching all locations in work area.

C. **Lifts:** Provide ladders, scaffolding, and lifts as required to provide access to all surfaces in the area to be subjected to visual inspection. Access is to allow touching of all surfaces.

3.5 CLEARANCE AIR SAMPLING BY OWNER (TEM):

D. **Transmission Electron Microscopy (TEM):** After the work area is found to be visually clean TEM air samples will be collected and analyzed by the Owner in accordance with the procedure for Transmission Electron Microscopy set forth in Part 1 of this section.

6.d If Release Criteria are not met, repeat Final Cleaning and continue Decontamination procedure from that point.

7.d If Release Criteria are met, remove work area isolation in accordance with requirements of this section.

3.6 FINAL AIR SAMPLING BY OWNER (PCM):

A. **Work Area Size Limitation:** PCM without TEM sampling will be used to clear Work Areas where the ACM involved in the work are less than or equal to 35 cubic feet, 160 square feet (15 sq meters), or 260 linear feet (80 linear meters).

B. **Phase Contrast Microscopy (PCM):** After the work area is found to be visually clean, air samples will be taken and analyzed by the Owner in accordance with the procedure for Phase Contrast Microscopy set forth in Part 1 of this section.

8d If Release Criteria are not met, repeat Final Cleaning and continue Decontamination Procedure from that point.

9d If Release Criteria are met, proceed to work of this Section on Removal of Work Area Isolation.

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3.7 LOCK-BACK:

A. **Encapsulation of substrate:** Perform encapsulation of substrate or installation of spray-applied finishes or fireproofing, where required, before Removal of Work Area Isolation as specified below. Maintain Pressure Differential System in operation during encapsulation work.

3.8 REMOVAL OF WORK AREA ISOLATION:

A. **After all requirements of this section and Section 01714 Work Area Clearance** have been met:

10.d Shut down and remove the Pressure Differential System. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6 mil (0.15 mm) polyethylene sheet and duct tape to form a tight seal at intake end before being moved from Work Area.

11.d Remove Personnel Decontamination Unit.

12.d Remove the Critical Barriers separating the Work Area from the rest of the building. Remove any small quantities of residual material found upon removal of the plastic sheeting with wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities, as determined by the Designer, are found then the entire area affected shall be decontaminated as specified in Section 01712 Cleaning & Decontamination Procedures.

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

14.d Dispose of all asbestos-containing waste material as specified in Section 02084 Disposal of Regulated Asbestos Containing Material.

3.9 SUBSTANTIAL COMPLETION OF ABATEMENT WORK:

A. **Asbestos Abatement Work is Substantially Complete** upon meeting the requirements of this section including submission of:
   15.d Certificate of Visual Inspection
   16.d Receipts Documenting proper disposal as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.
   17.d Punch list detailing repairs to be made and incomplete items.

3.10 CERTIFICATE OF VISUAL INSPECTION:

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

END OF SECTION - 01711

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01712
Cleaning and Decontamination Procedures

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Environmental Services

SECTION 01712 - CLEANING AND DECONTAMINATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF THE WORK:

A. **The extent** of cleaning and decontamination work is shown on the drawings.

B. ***The work includes:*** *This section will be implemented on individual projects.*

C. **The work includes** decontamination of the areas indicated in the "Schedule of Decontamination Work," found at the end of this section.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Work Area Clearance:** Specified in Section 01714 Work Area Clearance

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION

3.1 GENERAL:

A. **Complete the following before start of work** of this section:

1. 01527 Regulated Areas
2. 01562 Respiratory Protection
3. 01561 Worker Protection - Repair and Maintenance

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3.2 WET CLEANING:

A. **Accomplish wet cleaning** during decontamination with paper towels or disposable rags:

B. **Immerse paper towel** or rag in container of amended water or dilute removal encapsulant.

C. **Wring out,**

D. **Fold into quarters,**

E. **Wipe surface once** and refold to a fresh face of cloth. Proceed in this manner until all available faces of paper towel or rag have been used.

F. **Dispose of paper towel** or rag,

G. **Do not place rag back in container** to rinse out or for any other purpose. If a used towel or rag comes in contact with water, empty container and refill.

H. **Material adhered** to a surface with removal encapsulant may require the application of additional removal encapsulant to facilitate cleaning.

3.3 REMOVAL OF ASBESTOS-CONTAINING DEBRIS

A. ***Work of this Section** is limited to the cleanup of a small quantity of amassed debris which has fallen from an architectural finish, fire-proofing, or thermal insulation on pipes, boilers and other equipment.*

B. **Remove asbestos-containing debris** and decontaminate the area involved using the following sequence:

1. Shut down all ventilation into room.

2. Seal entry to work area with 6 mil (0.15 mm) polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

3. Start HEPA vacuum before entering the area.

4. Use the HEPA vacuum to clean a path at least 6 feet (1.83 m) wide from the entry point of the work area to the site of the fallen material.

5. Remove all small debris with the HEPA vacuum.

6. HEPA vacuum surfaces of all pieces too large to be removed by the suction of the HEPA vacuum.

7. Pick up such pieces and place in the bottom of a 6 mil (0.15 mm) polyethylene disposal bag conforming to the requirements of Section 02084 Disposal of Regulated Asbestos-Containing Material. Place pieces in the bag without dropping and avoiding unnecessary disturbance and release of material.

8. Remove all remaining visible debris with HEPA vacuum.

9. HEPA vacuum an area 3 feet (0.91 m) beyond the location in which any visible debris was found in two directions each at right angles to the other.

10. Place a 6 mil (0.15 mm) polyethylene drop cloth in accordance with Section 01527, Local Area Protection, immediately on top of the HEPA vacuumed area before performing any repair work on site from which fall-out occurred.

11. HEPA vacuum the site from which material fell removing all loose material which can be removed by the vacuums suction.

12. Repair or remove remaining material.

13. HEPA vacuum ladder and/or any tools used and pass out of the work area.

C. **HEPA vacuum all surfaces** in the room starting at the top of wall and working downward to the floor. Then start at corner of floor farthest from Work Area entrance and work towards entrance.

1. HEPA vacuum the floor using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch (1.6 mm) of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one-half the width of the floor attachment. At the completion of one cleaning vacuum the floor a second time at right angles to the first.

D. **Secure area from occupancy** until air monitoring results per Section 01714 Project Decontamination indicate that area is safe for re-occupancy.

3.4 CLEANING AND DECONTAMINATING OBJECTS

A. **Perform all work of decontaminating objects** wherever possible on a plastic drop sheet installed in conformance with Section 01527.

B. **HEPA vacuum** all surfaces of object and immediate area before moving the object.

C. **Pick-up object**, if possible, and HEPA vacuum all surfaces.

D. **Hand to off-sheet worker** who will wet-clean object, if possible, and place in storage location.

E. **Decontaminate area** where object was located by HEPA vacuuming twice, in two perpendicular directions. Wet clean if necessary to remove any debris.

F. **Return object** to its original location.

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3.5 DECONTAMINATION OF ROOMS:

A. **Shut down all ventilation into space.**

B. **Seal entry to Work Area** with 6 mil (0.15 mm) polyethylene. Slit polyethylene for entry. Install a flap to cover the slit automatically; tape slit closed after entry.

C. **Install Differential Pressure System** in accordance with Section 01513.

D. **Recirculate HEPA filtered fan units** in space by operating them so that discharge from machine is back into room. Use one HEPA filtered fan unit for each 2,500 cubic feet (70.8 cubic meters) of room volume. If this process is not feasible or causing more air borne fibers then the filtered air will be discharged outside of the building.

E. **HEPA vacuum all surfaces** in the room starting at the ceiling, then top of wall and working downward to the floor.

F. **HEPA vacuum the floor** using a floor attachment with rubber floor seals and adjustable floor to attachment height. Adjust the height so that the rubber seals just touch the floor if carpeted and are within 1/16 inch (1.6 mm) of hard surface floors. Vacuum the floor in parallel passes with each pass overlapping the previous by one half the width of the floor attachment. At the completion of one cleaning, vacuum the floor a second time at right angles to the first.

G. **Operate HEPA filtered fan unit** in space for 96 air changes minimum.

H. **At completion of Decontamination Work** workers decontaminate in accordance with Section 01561 Worker Protection - Repair and Maintenance.

I. **Secure area from occupancy** until air monitoring results per Section 01714 Work Area Clearance indicate area is safe for re-occupancy.

END OF SECTION - 01712

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Division 2
Site Work

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02061
Building Component Demolition – Asbestos Abatement

BrightFields, Inc.
Environmental Services

SECTION 02061 - BUILDING COMPONENT DEMOLITION-ASBESTOS ABATEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF THE WORK

A. **The work of this Section** includes the demolition of buildings and installations where asbestos containing materials are present.

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1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Work to be completed prior to start of the work of this section** are set forth in the following sections:
   1. 01560 Worker Protection - Asbestos abatement
   2. 01562 Respiratory Protection
   3. 01563 Decontamination Units

B. **Section 02084 Disposal of Regulated Asbestos-Containing Material** describes the handling and disposal of asbestos-containing waste.

C. **Section 02086 Hazardous Waste Management** describes the management and disposal of hazardous waste such as PCB Ballasts, fluorescent light tubes, and mercury containing thermostats encountered during the work of this section.

1.4 SUBMITTALS:

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

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

2. Removal Encapsulant: Submit product data, use instructions and recommendations from manufacturer of removal encapsulant intended for use. Include data substantiating that material complies with requirements.
3. NESHAP Certification: Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet asbestos-containing materials (ACM) to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

B. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been Received or Not Reviewed.
1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
   a. Surfactants.
   b. Encapsulants.

PART 2 - PRODUCTS:

2.1 MATERIALS

A. **Wetting Materials:** For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:

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

C. **Removal Encapsulant:** Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons of water.

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D. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick frosted, or black as indicated.

E. **Polyethylene Sheet:** Provide flame resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick, frosted or black as indicated.

F. **Reinforced Polyethylene Sheet:** Where plastic sheet is the only separation between the Work Area and building exterior, provide translucent, nylon reinforced, laminated, flame resistant, polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil (0.15 mm) thick , frosted or black as indicated.

G. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (51 mm or 76 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

PART 3 - EXECUTION

3.1 WORKER PROTECTION:

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

3.2 REMOVAL OF ARCHITECTURAL FINISHES, FIREPROOFING, AND THERMAL SYSTEM INSULATION:

A. **Isolate Work Area:** from the building exterior and other portions of the building. Where existing walls, doors, windows, or other such closure is missing, seal openings with polyethylene sheet at least 6 mil (0.15 mm) in thickness, mechanically fastened in place and sealed with duct tape or spray glue. Seal broken windows or other openings to the building exterior with nylon-reinforced plastic.

B. **Drop Cloth:** Install a drop cloth consisting of clear 6 mil (0.15 mm) sheet plastic in any area where asbestos removal work is to be carried out.

C. **Adequately wet** ACM to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of water, amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for water, amended water or removal encapsulant to penetrate material thoroughly. If water or amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's instructions. Perforate outer covering of any installation which has been painted and/or jacketed in order to allow penetration of water, amended water or removal encapsulant, or where necessary, carefully strip away while simultaneously wetting the installation to minimize dispersal of asbestos fibers into the air.

D. **Remove Saturated ACM** in small sections from all areas. Scrape materials from substrate and remove residue using nylon bristled hand brush or high pressure washer. Remove materials in manageable quantities and control the descent to staging or floor below. If height is over 20' use drop chute to contain material during descent. If using water or amended water spray mist continuously during work process. Do not allow material to dry out. As it is removed, simultaneously pack material while still wet into disposal bags. Seal bags, clean outside and move to washdown station adjacent to Material Decontamination Unit.

B. **At Completion of Removal Work:** Clean all surfaces in the removal area by wet wiping, HEPA vacuuming or washing down with hoses. Clean from top down. At Contractor's option a proportional feed nozzle may be used to add a surfactant to the water. Collect any water runoff and

filter through a dual filtration system. Provide first filter that removes fibers 20 microns and larger, and a final filter that removes all fibers 5 microns and larger.

C. **Visual Inspection:** Visually inspect work area for debris. If any visible debris is noted, clean all surfaces in the Work Area again. Continue this procedure until no visible debris is found in the Work Area.

D. **Final Air Testing:** If the Work Area is to remain unoccupied prior to demolition or be occupied only by workers wearing the proper respiratory protection then final air testing is unnecessary. If the area is to be occupied prior to demolition clear the Work Area in accordance with requirements of section 01711 Project Decontamination.

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3.3 HAZARDOUS WASTE MANAGEMENT AND DISPOSAL.

A. **Manage and dispose of hazardous waste** such as PCB ballasts, fluorescent light tubes, and mercury thermostats in accordance with the requirements of Section 02086 - Hazardous Waste Management.

B. **Do not mix potentially hazardous waste streams.** Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

C. **Segregate, package, label, transport and dispose** of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.4 DISPOSAL OF WASTE:

A. **Pack:** All asbestos-containing or contaminated waste material in bags marked as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

3.5 REMOVAL OF COMPLETE SYSTEMS:

A. **Before Starting Work of This Section:** Complete the work set forth in the following specification sections:
1. Section 01527 Local Area Protection
2. Section 01561 Worker Protection - Repair and Maintenance
3. Section 01562 Respiratory Protection

B. Completely Seal all components to be removed in 6 mil (0.15 mm) polyethylene sheet sealed with duct tape. Candy stripe surface of plastic as reinforcement. Wrap large items such as boilers,

tanks, and converters with nylon reinforced sheet plastic. Install sheet plastic to allow cutting of components into sections where this is necessary for the work.

C. Remove ACM where necessary to allow the cutting components into sections using the procedures set forth in Section 01529 "Mini Enclosures and Glovebags" of these Specifications.

D. Remove Components: In largest sections possible.

END OF SECTION - 02061

02062
Non-Asbestos Demolition

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SECTION 02062 - NON-ASBESTOS DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **Extent of non-asbestos selective demolition** work is indicated on drawings.

B. **Non-Asbestos Demolition Work:** Non-asbestos demolition requires the selective removal and subsequent off site disposal of the non- asbestos containing installations, here is an example list:

1. *Portions of building structure indicated on drawings and as required to accommodate new construction*
2. *Removal of interior demountable partitions as indicated on drawings*
3. *Removal of concrete masonry partitions as indicated on drawings*
4. *Removal of doors and frames indicated "remove"*
5. *Removal of built-in casework indicated "remove"*
6. *Removal of existing windows indicated to be bricked-in*
7. *Removal and protection of existing fixtures and equipment items indicated "salvage"*

C. **Decontaminated Materials:** The following materials are to be decontaminated in work of other sections. These decontaminated materials are to be disposed of as work of this section, example list:

1. *Ceiling tiles*
2. *Ceiling suspension system*
3. *Metal framing from drywall partitions*

4. *Wood framing from drywall partitions*

5. *Piping and conduit*

D. **Asbestos-Containing Materials (ACM):** The following are asbestos-containing or asbestos-contaminated installations which are not to be disturbed during work of this section, example list:

1. *Vinyl asbestos floor tile*

2. *Drywall partitions*

3. *Acoustical plaster in auditorium and corridors*

4. *Carpeting in auditorium and corridors*

5. *Fireproofing above suspended ceilings in all office areas*

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E. **Removal work specified elsewhere, example list:**

1. *Roofing removal is specified in Division 7.*

2. *Cutting non-structural concrete floors and masonry walls for underground piping and ducts, and for above grade piping, ducts, and conduit is included with the work of the respective mechanical and electrical Divisions 15 and 16 Specification Sections.*

3. *Cutting holes in roof deck and complete installation of new rooftop equipment is specified in Division-15.*

F. **Related work specified elsewhere, example list:**

1. *Remodeling construction work and patching is included within the respective Sections of Specifications, including removal of materials for re-use and incorporated into remodeling or new construction.*

2. *Relocation of pipes, conduits, ducts, other mechanical and electrical work are specified by respective trades.*

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Section 02086 Hazardous Waste Management** describes the management and disposal of hazardous waste such as PCB Ballasts, fluorescent light tubes, and mercury containing thermostats encountered during the work of this section.

1.4 SUBMITTALS:

A. **Schedule:** Submit schedule indicating proposed methods and sequence of operations for non-asbestos demolition work to Designer for review prior to commencement of work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

2. Coordinate with Owner's continuing occupation of portions of existing building.

1.5 JOB CONDITIONS:

A. **Occupancy:** Owner could be continuously occupying areas of the building immediately adjacent to areas of selective demolition. Conduct selective demolition work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which will impact Owner's normal operations.

B. **Condition of Structures:** Owner assumes no responsibility for actual condition of items or structures to be demolished.

1. Conditions existing at time of commencement of Contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's removal and salvage operations prior to start of selective demolition work.

C. **Partial Demolition and Removal:** Items indicated to be removed but of salvable value to Contractor may be removed from structure as work progresses. Transport salvaged items from site as they are removed.

1. Storage or sale of removed items on site will not be permitted.

D. **Protections:** Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.

1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of building.

2. Erect temporary covered passageways as required by authorities having jurisdiction.

3. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.

4. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.

5. Protect floors with suitable coverings when necessary.

6. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

7. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.

8. Remove protections at completion of work.

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E. **Damages:** Promptly repair damages caused to adjacent facilities by demolition work at no cost to Owner.

F. **Traffic:** Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities

1. Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

G. **Explosives:** Use of explosives will not be permitted.

H. **Utility Services:** Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

I. **Environmental Controls:** Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions, such as ice, flooding, or pollution.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION

3.1 INSPECTION:

A. **Prior to commencement of selective demolition work,** inspect areas in which work will be performed. Photograph existing conditions of structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from selective demolition work. Submit copies of photographs to Designer prior to starting work.

3.2 PREPARATION:

A. **Decontamination Unit:** Prior to beginning work of this Section complete installation of a Personnel Decontamination Unit as described in Section 01563 Decontamination Units.

B. **Competent Person:** Work of this Section is to be supervised by an OSHA Competent Person as described in Section 01043 Project Coordination.

C. **Provide interior and exterior shoring,** bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.

1. Cease operations and notify the Designer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

D. **Cover and protect furniture,** equipment and fixtures to remain from soiling or damage when demolition work is performed in rooms or areas from which such items have not been removed.

1. Erect and maintain dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.

2. In areas where asbestos abatement work is to follow selective demolition erect barriers to control access as described in section 01562 ATemporary enclosures.≅

3. Where no asbestos abatement work is to follow selective demolitions and the work is immediately adjacent to occupied portions of the building, construct dustproof partitions of minimum 4 inch (100 mm) studs, 5/8 inch (16 mm) drywall (joints taped) on occupied side, 2 inch (13 mm) fire-retardant plywood on demolition side, and fill partition cavity with sound-deadening insulation.

4. Provide weatherproof closures for exterior openings resulting from demolition work.

E. **Work Site Isolation:** Isolate the site of selective demolition work from occupied portions of the building prior to start of demolition activities. Work site isolation includes:

1. Erection of Critical Barriers as described in Section 01526 Temporary Enclosures

2. Installation and operation of Pressure Differential and Ventilation System as describe in Section 01513

3. Locate, identify, stub off and disconnect utility services that are not indicated to remain

4. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of building. Provide minimum of 72 hours advance notice to Owner if shutdown of service is necessary during change-over.

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3.3 DEMOLITION:

A. **Perform selective demolition work** in a systematic manner. Use such methods as required to complete work indicated on Drawings in accordance with demolition schedule and governing regulations.

B. **Demolish concrete and masonry in small sections.** Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools; do not use power-driven impact tools.

C. **Locate demolition equipment** throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

D. **Provide services** for effective air and water pollution controls as required by local authorities having jurisdiction.

E. **Demolish foundation walls to a depth** of not less than 12 inches (300 mm) below existing ground surface. Demolish and remove below-grade wood or metal construction. Break up below-grade concrete slabs.

F. **For interior slabs on grade,** use removal methods that will not crack or structurally disturb adjacent slabs or partitions. Use power saw where possible.

G. **Completely fill below-grade areas** and voids resulting from demolition work. Provide fill consisting of approved earth, gravel or sand, free of trash and debris, stones over 6 inch (150 mm) diameter, roots or other organic matter.

H. **If unanticipated mechanical,** electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict.

Submit report to Designer in written, accurate detail. Pending receipt of directive from Designer rearrange selective demolition schedule as necessary to continue overall job progress without delay.

I. **Asbestos contamination:** If a disturbance of ACM occurs remove any released material and decontaminate the immediate vicinity of the release in accordance with the requirements of Section 01712 Cleaning & Decontamination Procedures.

3.4 SALVAGE MATERIALS:

A. **Salvage Items:** Where indicated on Drawings as "Salvage - Deliver to Owner," carefully remove indicated items, clean, store and turn over to Owner and obtain receipt.

1. Historic artifacts, including cornerstones and their contents, commemorative plaques and tablets, antiques, and other articles of historic significance remain the property of the Owner. Notify Designer if such items are encountered and obtain acceptance regarding method of removal and salvage for Owner.

B. **Carefully remove,** clean, and deliver to Owner the following items, example list:

1. Light Fixtures

2. Demountable partitions

3. Office landscaping

4. Wood paneling in Boardroom

5. Chandelier in entrance lobby

6. Statue in courtyard fountain

7. Commemorative plaque at main entrance

8. Five (5) lions head sculptures from East wing cornice frieze

3.5 HAZARDOUS WASTE MANAGEMENT AND DISPOSAL.

A. **Manage and dispose of hazardous waste** such as PCB ballasts, fluorescent light tubes, and mercury thermostats in accordance with the requirements of Section 02086 - Hazardous Waste Management.

B. **Do not mix potentially hazardous waste streams.** Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

C. **Segregate, package, label, transport and dispose** of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.6 DISPOSAL OF DEMOLISHED MATERIALS:

A. **Remove debris, rubbish** and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

B. **If hazardous non-asbestos containing materials** are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

C. **Burning** of removed materials is not permitted on project site.

D. **Disposal of asbestos-containing waste** is not in the work of this section. Disposal of this material is specified in Section 02084 Disposal of Regulated Asbestos Containing Material.

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3.7 CLEAN-UP AND REPAIR:

A. **Upon completion** of demolition work, remove tools, equipment and demolished materials from site.

B. **In areas where no asbestos abatement work is to occur**, remove protections and leave interior areas broom clean.

C. **In areas where asbestos abatement work is to occur**, leave protections in place as required by abatement work. Leave area broom clean. Additional cleaning as required for abatement work is not in work of this section.

D. **Repair** demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

E. **Perform** all repair work in asbestos abatement Work Areas after completion of asbestos abatement work.

END OF SECTION 02062

BrightFields, Inc.

02063
Removal of Asbestos Contaminated Materials

BrightFields, Inc.
Environmental Services

SECTION 02063 - REMOVAL OF ASBESTOS CONTAMINATED MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 SUMMARY OF WORK:

A. **Work of this section includes** removal and disposal of all non-Asbestos-Containing Material including but not limited to:

1. Ceiling system and supports
2. Removal of all carpeting from within the work area

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PART 2 - PRODUCTS

2.1 MATERIALS

A. **Unlabeled Clear Bags:** Provide clear 6 mil (0.15 mm) thick leak-tight polyethylene bags with no label.

B. **Disposal Bags:** Provide disposal bags as described in Section 02084 "Disposal of Regulated Asbestos-Containing Material"

PART 3 - EXECUTION

3.1 SEQUENCE

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

1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential and Air Circulation System
3. 01563 Decontamination Units
4. 01526 Temporary Enclosures
5. 01560 Worker Protection - Asbestos Abatement
6. 01562 Respiratory Protection; or
7. 01527 - Regulated Areas
8. 01529 - Mini Enclosures and Glovebags
9. 01561 - Worker Protection - Repair & Maintenance
10. 01562 - Respiratory Protection

3.2 CEILING SYSTEM:

A. **Non-Asbestos Ceiling Tiles:** Remove sufficient ceiling tiles to gain access to top of ceiling system. Mist top of tiles with amended water. Wet sufficiently to soak debris thoroughly, but not cause dripping. Remove ceiling tiles and carry to Wash Down Station. Wash ceiling tiles in wash down station. Bag washed tiles in unlabeled clear 6 mil (0.15 mm) bags. Dispose of tiles as non-asbestos waste.

1. Bag debris from washed off tiles in properly labeled asbestos disposal bags. Dispose of debris as asbestos-containing waste as set forth in Section 02084 Disposal of Regulated Asbestos-Containing Material.

B. **Support System:** Remove hangers, tracks, T-bars, etc. Decontaminate in Wash Down Station. Wrap in clear 6 mil (0.15 mm) sheet plastic. Dispose of as non-asbestos waste.

3.3 CARPETING:

A. **Deface carpeting** with a contrasting spray paint before the work. Coat lightly enough that wetting will not be retarded.

B. **Thoroughly wet asbestos-contaminated carpeting** to be removed to reduce fiber dispersal into the air. Wet carpet prior to cutting, rolling or any other activity that could disturb dust in or under the carpet. Accomplish wetting by a fine spray (mist) of amended water or encapsulant. Saturate material completely without causing excess dripping. Allow time for water or encapsulant to penetrate material thoroughly. Spray material repeatedly during the work process to maintain a continuously wet condition. Spraying amended water or encapsulant on carpeting during cutting or rolling to minimize dispersal of asbestos fibers into the air.

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C. **Cut seams in the carpeting and roll up** into rolls of carpeting that are no wider than factory width of carpeting. Roll or fold padding as necessary. Remove dust and debris from floor after removal of carpeting and padding by HEPA vacuuming followed by wet wiping.

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1. Wrap the rolled carpeting in two layers of 6 mil sheet plastic. Label and dispose of in accordance with requirements of specification section on "Disposal of Regulated Asbestos-Containing Waste".

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3.4 AIRBORNE FIBER LEVELS:

A. **Airborne Fiber Levels:** Maintain airborne fiber levels less than the "Stop Action Levels" set forth in Section 01013 ASummary of Work - Asbestos Abatement.

END OF SECTION - 02063

BrightFields, Inc.

02081
Removal of Asbestos Containing Materials

BrightFields, Inc.
Environmental Services

SECTION 02081 - REMOVAL OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

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A. **Worker Protection** requirements are set forth in Section 01560 Worker Protection - Asbestos abatement.

B. **Installation of Critical and Primary Barriers,** and Work Area Isolation Procedures are set forth in Section 01526 Temporary Enclosures.

C. **Project Decontamination** procedures after removal of the Secondary Barrier are specified in Section 01711 Project Decontamination.

D. **Disposal of asbestos-containing waste** is specified in Section 02084 Disposal of Regulated Asbestos-Containing Material.

E. **Section 02086 Hazardous Waste Management** describes the management and disposal of hazardous waste such as PCB Ballasts, fluorescent light tubes, and mercury containing thermostats encountered during the work of this section.

1.3 SUBMITTALS:

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

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

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

3. **NESHAP Certification:** Submit certification from manufacturer of surfactant or removal encapsulant that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will wet Asbestos-Containing Materials (ACM) to which it is applied as required by the National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

B. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been= AReceived - Not Reviewed.≅

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

   a. Surfactants.

   b. Encapsulants.

   c. Solvents.

PART 2 - PRODUCTS:

2.1 MATERIALS

A. **Wetting Materials:** For wetting prior to disturbance of ACM use either amended water or a removal encapsulant:

B. **Amended Water:** Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

C. **Removal Encapsulant:** Provide a penetrating type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the ACM and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether in five gallons (19 liters) of water.

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D. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size practicable to minimize seams, 6.0 mil (0.15 mm) thick clear, frosted, or black as indicated.

E. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (50mm or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

G. **Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled as required by Section 02084 Disposal of Regulated Asbestos Containing Material.

H. **Fiberboard Drums:** Provide heavy duty leak tight fiberboard drums with tight sealing locking metal tops.

I. **Paper board Boxes:** Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

J. **Felt:** Standard felt approximately 1/16 inch (1.6 mm) thick and 36 inches (900 mm) to 72 inches (1800 mm) in width.

PART 3 - EXECUTION

3.1 SECONDARY BARRIER:

A. **Secondary Barrier:** Over the Primary Barrier, install as a drop cloth a clear 6 mil (0.15 mm) sheet plastic in all areas where asbestos removal work is to be carried out. Completely cover floor with sheet plastic. Where the work is within 10 feet (3 m) of a wall extend the Secondary Barrier up wall to ceiling. Support sheet plastic on wall with duct tape, seal top of Secondary plastic to Primary Barrier with duct tape so that debris is unable to get behind it. Provide cross strips of duct tape at wall support as necessary to support sheet plastic and prevent its falling during removal operations.

1. **Install Secondary Barrier** at the beginning of each work shift. Install only sufficient plastic for work of that shift.

2. **Remove Secondary Barrier** at end of each work shift or as work in an area is completed. Fold plastic toward center of sheet and pack in disposal bags. Keep material on sheet continuously wet until bagged.

3. **Install Walkways** of black 6 mil (0.15 mm) plastic between active removal areas and decontamination units to protect Primary Layer from tracked material. Install walkways at the beginning of, and remove at the end of, each work shift.

3.2 WORKER PROTECTION:

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

3.3 WET REMOVAL:

A. **Thoroughly wet** to satisfaction of Designer ACM to be removed prior to stripping and/or tooling to reduce fiber dispersal into the air. Accomplish wetting by a fine spray (mist) of amended water or removal encapsulant. Saturate material sufficiently to wet to the substrate without causing excess dripping. Allow time for amended water or removal encapsulant to penetrate material thoroughly. If amended water is used, spray material repeatedly during the work process to maintain a continuously wet condition. If a removal encapsulant is used, apply in strict accordance with manufacturer's written instructions. Perforate outer covering of any installation which has been painted and/or jacketed in order to allow penetration of amended water or removal encapsulant, or use injection equipment to wet material under the covering. Where necessary,

carefully strip away while simultaneously spraying amended water or removal encapsulant on the installation to minimize dispersal of asbestos fibers into the air.

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

2. **Remove saturated ACM** in small sections from all areas. Do not allow material to dry out. As it is removed, simultaneously pack material while still wet into disposal bags. Twist neck of bags, bend over and seal with minimum three wraps of duct tape. Clean outside and move to Wash Down Station adjacent to Material Decontamination Unit.

3. **Evacuate air from disposal bags** with a HEPA filtered vacuum cleaner before sealing.

B. **Fireproofing or Architectural Finish on Scratch Coat:** Spray asbestos-containing fireproofing or architectural acoustic finish with a fine mist of amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate materials to substrate. Do not over-saturate to cause excess dripping. Scrape materials from substrate. Remove materials in manageable quantities and control the descent to staging or floor below, if over 20 feet (6000 mm) use drop chute to contain material during descent. If using amended water, spray mist surface continuously during work process. If using removal encapsulant follow manufacturer's written instructions. Remove residue remaining on scratch coat after scraping using stiff nylon bristled hand brush. Use high pressure washer only with written authorization of Designer. If a removal encapsulant is used remove residue completely before encapsulant dries. If substrate dries before complete removal of residue re-wet with amended water or removal encapsulant.

C. **Fireproofing or Architectural Finish on Wire Lath:** Spray asbestos-containing fireproofing or architectural acoustic finish with a fine mist of amended water or removal encapsulant. Allow time for amended water or removal encapsulant to saturate material completely. Do not over-saturate to cause excess dripping. If surface of material has been painted or otherwise coated cut small holes as required and apply amended water or removal encapsulant from above. Cut wire lath into manageable sections and cut hanger wires. Roll or fold up complete with ACM and hand place in container. Do not drop on floor. After removal of lath and ACM remove any overspray on decking and structure above using stiff nylon bristled brush. Use high pressure washer only with written authorization from Designer. Use one of the following methods for containing waste.

1. **Deposit material in corrugated paper board box.** When box is full duct tape closed and place in disposal bag.

2. **Wrap material in felt** and place in fiberboard drum lined with two disposal bags. Use caution to insure that all edges of wire lath that could cut plastic are covered with felt.

3. **Place material directly in a steel drum.** Seal drums when full with leak tight seal. Drum is to be leak tight in any orientation.

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D. **Pipe Insulation:** Spray with a mist of amended water or removal encapsulant. Allow amended water or removal encapsulant to saturate material to substrate. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cut bands holding preformed pipe insulation, slit jackets at seams, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks and hand place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with stiff bristle nylon hand brush. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6" (150 mm) from the point where it contacts the asbestos-containing insulation.

3.4 DRY REMOVAL:

A. **Dry Removal:** of ACM is required in the following areas where wetting may create a hazard for workers or damage equipment or finishes, the following are examples:

1. *Electrical closet on each floor: this space contains the vertical electrical bus for the building. This bus operates at 480 volts and must be kept in operation at all times.*

2. *Transformer vault: This space contains four large transformers operating at 14,000 volts on the primary side. These transformers must be kept in operation at all times.*

3. *High pressure steam lines from the boiler header to Steam Turbine no. 2. These line are operating at 300 psi (2100 kPa) and 422 degrees Fahrenheit (217 degrees Celsius) and cannot be shut down.*

4. *North Data Processing Center: This space contains operating computer equipment that must be maintained in operation throughout the work.*

5. *Reading Room: The damask wall coverings in this room are approximately 250 years old and extremely fragile.*

B. **Isolate dry removal area** from balance of Work Area by a Critical Barrier as described in Section 01526 Temporary Enclosures and a pressure differential between the dry removal area and Work Area as described in Section 01513 Pressure Differential System.

C. **EPA Authorization:** Do not begin dry removal work until authorized in writing by the EPA NESHAP coordinator and the Designer.

D. **OSHA Notification:** Do not begin dry removal work until notification to OSHA required by 29 CFR 1926.1101(g)(4)(6) is made.

E. **Active Electrical Equipment:** Do not wet materials in the vicinity of active electrical equipment. Dry remove any ACM in the vicinity of active electrical equipment.

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

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

3. **Personnel:** Work on active electrical equipment is to be performed by qualified trades persons with prior experience in the installation or repair of the involved equipment. Restrict access to electrical equipment.

4. **Electrical Isolation:** Cover exposed conductors with a minimum 1/8 inch (3 mm) thick neoprene blanket draped over the conductor and surrounding area.

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

6. **Work Procedures:** Perform removal work using "Localized Control of Material Release" and "Local Ventilation and Collection System" procedures described below.

F. **Hot Equipment:** Do not wet materials on hot piping or equipment. Dry remove any ACM on hot equipment.

1. **Restrict Access:** Maintain any existing access restrictions to areas with hot equipment. Provide railing or other barriers to prevent accidental contact with hot equipment. Allow access to area only to qualified trades persons with prior experience with the type of equipment involved.

2. **Warning Signs:** Post warning signs at hot equipment as required by OSHA or other applicable regulation.

3. **Personnel:** Work on hot equipment is to be performed by qualified trades persons with prior experience with the type of equipment involved. Restrict access to electrical equipment.

4. **Re-insulation:** Re-insulate equipment immediately following visual inspection. Do not allow more than 8 linear feet (2400 mm) of piping to be exposed at any time.

5. **Protective Equipment:** Provide workers working on or in the vicinity of hot equipment with appropriate protective equipment including insulating gloves, boots, and coveralls

6. **Work Procedures:** Perform removal work using "Localized Control of Material Release" and "Local Ventilation and Collection System" procedures described below.

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3.5 LOCALIZED CONTROL OF MATERIAL RELEASE:

A. **Pipe Insulation:** HEPA vacuum surface of pipe insulation. Cut bands holding preformed pipe insulation, slit jackets at seams while holding HEPA vacuum under cut, remove and hand-place in a disposal bag. Remove job-molded fitting insulation in chunks, using nozzle of HEPA vacuum to collect debris generated, and hand-place in a disposal bag. Do not drop to floor. Remove any residue on pipe or fitting with wire brush. Brushing toward the nozzle of a HEPA vacuum. In locations where pipe fitting insulation is removed from pipe with straight runs insulated with fibrous glass or other non-asbestos-containing fibrous material, remove fibrous material 6 inches (150 mm) from the point where it contacts the asbestos-containing insulation. Use a two worker crew for work, with one worker removing material and one worker holding the nozzle of a HEPA vacuum in the location of disturbance.

B. **Material sprayed on wire lath:** Hold the nozzle from an operating HEPA filtered vacuum cleaner in the immediate vicinity of and below the work while cutting the wire lath or otherwise disturbing the ACM. Use a two-worker crew for cutting, with one worker cutting and one worker holding the HEPA vacuum nozzle.

3.6 LOCAL VENTILATION AND COLLECTION SYSTEM:

A. **Provide local ventilation and collection systems** as described below for each area where amosite or dry ACM is being removed or otherwise disturbed:

1. **Provide HEPA filtered fan units in addition** to those required by section 01513, in the vicinity of the work. Arrange so that the units exhaust into the Work Area oriented in a direction away from the work. Extend a 12 inch (300 mm) diameter flexible non-collapsing duct from the intake end to a point no more than 4 feet (1200 mm) from any scraping or wire brushing activity.

2. **Locate intake** of duct so that air flow is horizontally and slightly downward into intake. Replace primary filters on HEPA filtered fan units at an interval of no greater that 30 minutes. Allow no more than one scraping or wire brushing activity per fan unit.

3.7 HAZARDOUS WASTE MANAGEMENT AND DISPOSAL.

A. **Manage and dispose of hazardous waste** such as PCB ballasts, fluorescent light tubes, and mercury thermostats in accordance with the requirements of Section 02086 - Hazardous Waste Management.

B. **Do not mix potentially hazardous waste streams.** Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

C. **Segregate, package, label, transport and dispose** of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

END OF SECTION - 02081

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02082
Removal of Asbestos Contaminated Soil

BrightFields, Inc.
Environmental Services

SECTION 02082 - REMOVAL OF ASBESTOS-CONTAMINATED SOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. **Asbestos abatement project requirements** to be completed prior to start of the work of this section are set forth in the following sections:
1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential & Air Circulation System
3. 01526 Temporary Enclosures - Complete Work Except Delete Floor Plastic.
4. 01560 Worker Protection - Asbestos abatement
5. 01562 Respiratory Protection
6. 01563 Decontamination Units

B. **Asbestos abatement project requirements** to be completed at completion of the work of this section are set forth in the following sections:
1. 01711 Project Decontamination

C. **Amended water and removal encapsulant** are specified in Section 02081 Removal of Asbestos-Containing Materials.

PART 2 - PRODUCTS (NOT APPLICABLE)

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PART 3 - EXECUTION

3.1 PROCEDURES

A. **Wet Soils:** After removal of the Secondary Barrier and floor layer of Primary Barrier, remove the top one inch (1")(25 mm) of soils which are damp or wet and place in disposal bags. Start removal at the point of work farthest from the entrance to the soil floor area and proceed toward the entrance. Do not permit traffic into the fresh soil surface. Arrange Pressure Differential System so that air flow is the starting point of work toward the entrance. After the entire first layer of soil is removed completely change coveralls and at the entrance to the soil removal area don clean boot covers. Remove the second one inch (1")(25 mm) of soil in the same manner as the first. Carry out the decontamination procedures set forth in the "Project Decontamination" section of this specification at this time. At the end of project decontamination remove the third one inch (1") (25 mm) of soil in the same manner as the previous two inches (2") (50 mm).

B. **Dry Soils:** Use the same procedure for dry soils, except saturate soil with amended water or a removal encapsulant as specified in other Division 2 sections of the specification. If a removal encapsulant is used, use in accordance with manufacturer's instructions. Saturate soil beyond the inch of soil currently being removed. If amended water is used keep the surface of the soil continuously wet throughout removal and decontamination.

END OF SECTION - 02082

02084
Disposal of Regulated Asbestos Containing Material

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BrightFields, Inc.
Environmental Services

SECTION 02084 - DISPOSAL OF REGULATED ASBESTOS-CONTAINING MATERIAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. **Worker protection requirements** are set forth in Sections 01560 Worker Protection - Asbestos abatement

B. **Section 01098 Codes, Regulations and Standards - Asbestos Abatement** describes applicable federal, state and local regulations.

1.3 DESCRIPTION OF THE WORK:

A. **This section describes the disposal of Regulated Asbestos-Containing Materials (RACM).** Disposal includes packaging of Regulated Asbestos-Containing Materials. Disposal may be accomplished either by land filling or converting Regulated Asbestos Containing Materials to non Asbestos waste.

1.4 SUBMITTALS:

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

1. **Copy of state or local license** for waste hauler.

2. **Name and address of landfill** where Regulated Asbestos Containing Materials are to be buried. Include contact person and telephone number.

3. **Name and address of processor** where Regulated Asbestos-Containing Materials are to be processed into non-asbestos waste. Include contact person and telephone number. Also provide the following information about the process and operation used by the processor:

   a. Results of start-up performance testing and performance testing for last 90 days including operating parameters, feed characteristics, and analysis of output materials.

   b. Results of composite analysis required during initial 90 days of operation and results of composite analysis of monthly product composite samples for last 90 days.

   c. Results of continuous monitoring and logs of process operating parameters for the initial 90 days and last 90 days of operation.

   d. A description of any deviation from the operating parameters established during performance testing, the duration of the deviation, and steps taken to correct the deviation.

   e. Product data on process to be used

4. **Chain of Custody form** and form of waste manifest proposed

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

B. **On a weekly basis** submit copies of all manifests and disposal site receipts to Designer.

C. **Waste Shipment Record:** Maintain a waste shipment record as required by the NESHAP regulation which indicates the waste generator, transporter, and disposal site, and which describes the nature, size, type of container, and form of asbestos waste. Submit to Designer within 35 days of departure from building.

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PART 2 - PRODUCTS:

2.1 MATERIALS

A. **Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled with three labels with text as follows:

1. **First Label:** Provide in accordance with 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
BREATHING AIRBORNE FIBERS IS
HAZARDOUS TO YOUR HEALTH

2. **Second Label:** Provide in accordance with U. S. Department of Transportation regulation on hazardous waste marking. 49 CFR parts 171 and 172. Hazardous Substances

RQ-ASBESTOS WASTE
CLASS 9
NA2212-PG III

3. **Third Label:** Provide the name of the waste generator (Owner's name), the location from which the waste was generated and the names and addresses of the contractor and transporter. This label must be durable, able to repel dirt and moisture (e.g., permanent marker). Label must be placed directly on disposal bag(s) in a legible format. **Peel and stick type labels are expressly prohibited.**

2.2 VITRIFICATION:

A. **Convert Regulated Asbestos-Containing Materials to non-asbestos waste** by thermal conversion in a process including the following principal elements. Comply with all EPA and DOT requirements for asbestos waste until the waste is converted:

1. **Receiving and storage:** areas that are maintained as contained controlled areas isolated by physical barriers and a pressure differential

2. **Melting:** process that is intrinsically safe in that it will not allow unconverted asbestos to appear in the final product under any circumstances

B. **Processor:** Use a processor that meets all the requirements of the EPA NESHAP regulation for an operation that converts regulated asbestos-containing material and asbestos-containing waste material into non-asbestos (asbestos-free) material as set forth in 40 CFR 61 Sub-part A and M section 61.155

C. **Available Processors:** Subject to compliance with requirements, providers of processes include, but are not limited to, the following:

D. **Processors:** Subject to compliance with requirements, utilize process provided by one of the Following:

1. GTS Duratek
   8955 Guilford Rd
   Suite 200
   Columbia, MD 21045
   (800) 638-3838

2. Penberthy Electromelt
   631 So. 96th Street
   Seattle, WA 98108

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PART 3 - EXECUTION

3.1 SEQUENCE

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

1. **Section 01560** Worker Protection - Asbestos Abatement

2. **Section 01562** Respiratory Protection

3.2 GENERAL:

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

B. **Liquid waste:** Mix all liquid asbestos-containing waste or asbestos contaminated waste with a bladeable material so that it forms a bladeable (non-liquid) form, and have the concurrence of the landfill operator prior to disposal.

C. **Load all adequately wetted Regulated Asbestos-Containing Material** in disposal bags or leak-tight containers. All materials are to be contained in one of the following

1. **Two 6 mil (0.15 mm) disposal bags** or

2. **Two 6 mil (0.15 mm) disposal bags and a fiberboard drum** or

3. **Sealed steel drum** with no bag

D. **Protect interior of truck** or dumpster with Critical and Primary Barriers as described in Section 01526 Temporary Enclosures.

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

F. **Warning Signs:** During loading and unloading mark dumpsters, receptacles and vehicles with a sign complying with requirements of the EPA NESHAP regulation (40 CFR Part 61), in a manner and location that a person can read the following legend :

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

G. **Do not store containerized materials outside of the Work Area.** Take containers from the Work Area directly to a sealed truck or dumpster.

H. **Do not transport disposal bagged materials on open trucks.** Label drums with same warning labels as bags. Uncontaminated drums may be reused. Treat drums that have been contaminated as Regulated Asbestos-Containing Material and dispose of in accordance with this specification.

I. **Advise the landfill** operator or processor, at least ten days in advance of transport, of the quantity of material to be delivered.

J. **At disposal site** unload containerized waste:

1. **At a disposal site,** sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for re-bagging. Clean entire truck and contents using procedures set forth in section 01711 Project Decontamination.

2. **At a processing site** truck and loading dock are arranged as a controlled work area and containerized waste is transferred to storage area by site personnel. All bags including broken ones will be transferred. Clean truck, using procedures set forth in section 01711 Project Decontamination.

K. **Retain receipts from landfill** or processor for materials disposed of.

L. **At completion of hauling** and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Designer.

END OF SECTION - 02084

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02085
Resilient Floor Covering Manufacturer's Recommended Work Practices

BrightFields, Inc.
Environmental Services

SECTION 02085 - RESILIENT FLOORING REMOVAL - RESILIENT FLOOR COVERING MANUFACTURERS' RECOMMENDED WORK PRACTICES:

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. **Work** described by this section relates to work practices as currently set forth in "Recommended Work Practices for the Removal of Resilient Floor Coverings,≅ revised August, 1995, published by:

1. Resilient Floor Covering Institute
   966 Hungerford Drive
   Suite 12-B
   Rockville, MD 20850

2. Armstrong World Industries, Inc.
   P.O. Box 3001
   Lancaster, PA 17604

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1.2 SUMMARY

A. **This Section** includes work practices for removal of resilient floor covering materials which are Aintact, and are likely to remain intact during the removal, and can be removed under a negative exposure assessment in compliance with the OSHA standard by appropriately trained workers using the Recommended Work Practices.

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

1. **Division 2 Section 02084 "Disposal of Regulated Asbestos-Containing Material"** for disposal of friable asbestos-containing waste. Note that resilient floor covering is defined by the EPA NESHAP regulation as Category 1 non-friable ACM and as such is not covered by Section 02084. Resilient floor covering materials should be disposed of in accordance with any applicable state and local regulations.

1.3 DEFINITIONS

A. **Compliant Work Practices:** Work practices for the removal of flooring material which OSHA has determined will consistently result in exposures below the TWA and excursion limit established by 29 CFR 1926.1101. Recommended Work Practices described in this Section have been recognized by OSHA as Compliant Work Practices.

B. **Recommended Work Practices:** ARecommended Work Practices for the Removal of Resilient Floor Coverings, revised August, 1995, published by the Resilient Floor Covering Institute (RFCI) and Armstrong World Industries, Inc.

C. **Friable:** Material that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

D. **Intact:** means that ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix. The incidental breakage of flooring materials, or slicing of sheet vinyl floor covering with a sharp edged instrument, during removal operations conducted in accordance with the Recommended Work Practices does not mean that the materials are not removed in an intact conditions. Intact resilient floor covering materials will be rendered friable if subjected to sanding, sawing or other aggressive operations.

E. **Competent Person:** An individual with the training and experience required by OSHA for a Competent Person involved in removal of intact flooring material using compliant work practices (12 hours of training). The competent person will supervise the work of this section, and is responsible for the health and safety of workers at the flooring material removal job site. The competent person must have authority to stop work, and take corrective action.

F. **Initial Exposure Assessment:** An inspection made by a Competent Person of the job site prior to the start of removal operations for the purpose of determining if the requirements of a negative exposure assessment are met.

G. **Negative Exposure Assessment:** Based on data in the rulemaking record, OSHA has determined that worker exposures will consistently be below the TWA and excursion limit during removal of intact flooring material when compliant work practices are used. As such, a Competent Person may make a negative exposure assessment when:

1. Recommended Work Practices will be used.
2. Workers are properly trained.
3. The resilient flooring is intact and is likely to remain intact throughout the removal process.

1.4 WORKER PROTECTION

A. **Worker Training:** Workers using the Recommended Work Practices for the intact removal of resilient floor covering materials must have completed an 8-hour training program as required by the OSHA regulation 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63 Appendix D, covering asbestos subjects as well as training in the Recommended Work Practices. Workers with this amount of training only are not permitted to continue working if the material becomes non-intact.

B. **Competent Person:** Engage a person experienced in the use of the Recommended Work Practices who has completed an 8-hour worker training program and additional 4 hours of training as required by the OSHA regulation 29 CFR 1926.1101(k) and the Compliance Directive CPL 2-2.63 Appendix D, for a Competent Person involved in removal of intact flooring material using compliant work practices. Competent Persons with this amount of training only are not permitted to continue working if the material becomes non-intact.

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

D. **Medical Surveillance:** Workers who engage in the removal of asbestos-containing flooring materials for more than 30 days per year (one hour or more per day) must receive medical surveillance. This requires a medical examination within 10 working days following the 30th day of exposure.

E. **Prohibitions in work area:** Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area.

F. **Certificate of Worker Acknowledgment:** Have each worker who is at the job site or who will enter the work area, fill out and sign a copy of the Certificate of Worker's Acknowledgment found at the end of this section.

1.5 QUALITY ASSURANCE

A. **Notifications:** Before the start of Work notify the following of the presence and location of ACM and of the planned removal activity:

1. Employees performing the work.
2. Employers of employees working in the area (not separated from the work area by either a wall, closed door or window or other impermeable barrier).
3. The building owner.

B. **Regulatory Compliance:** Comply with provisions of the following:

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1. OSHA Construction Standard for Asbestos 29 CFR 1926.1101

2. OSHA Compliance Directive CPL 2-2.63 November 3, 1995, Inspection Procedures for Occupational Exposures to Asbestos Final Rule 29 CFR Parts 1910.1001, 1926.1101, and 1915.1001. .

3. OSHA 29 CFR 1926.2 through 35

4. Applicable state and local regulations.

C. **Non-Intact Material:** If the resilient flooring materials become non-intact during the work, stop work until the job can be evaluated by a competent person. Do not resume work until:

1. The job can be evaluated and supervised by a competent person who has completed a training course meeting the criteria of EPA's Model Accreditation Plan for supervisors, and

2. The work will be carried out by workers who have completed training meeting the criteria of the EPA's Model Accreditation Plan for asbestos abatement workers.

3. The work will be carried out in accordance with worker and area protection specified in Section 02087.

1.6 SUBMITTALS

A. **Negative Exposure Assessment:** Before starting any work submit a Negative Exposure Assessment certified by a Competent Person to the Owner. If a Negative Exposure Assessment cannot be made, report the reasons and any corrective action that would result in a Negative Exposure Assessment. The certification must be signed and dated by a Competent Person and be based on an Initial Assessment of the work of this contract. A copy of the negative exposure assessment should be retained by the employer of the Competent Person. The certification must include:

1. The name and signature of the Competent Person making the Assessment.

2. Certification that the Competent Person has been trained as required by OSHA for work on intact resilient flooring.

3. A description of the work including:
   a. Name and address of facility where the work is to occur.
   b. Description of location within the facility where work is to occur.

4. Certification that:
   a. Recommended Work Practices will be used.
   b. Workers will be properly trained as required by OSHA for work on intact resilient flooring.
   c. The resilient flooring is intact and is likely to remain intact throughout the removal process.

5. Complete and submit to the Owner the job form from AUsing Compliant Work Practices to Remove Resilient Floor Covering published by the Resilient Floor Covering Institute (RFCI) and Armstrong World Industries, Inc. This form is to be signed by a Competent Person. Retain a copy of the form.

6. Certificate of Worker Acknowledgment: Submit an original signed copy of the Certificate of Worker's Acknowledgment found at the end of this section, for each worker who is to be at the job site or who will enter the work area.

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PART 2 - PRODUCTS:

2.1 MATERIALS

A. **Wetting Materials:** For wetting prior to disturbance of asbestos-containing sheet flooring or asphaltic adhesive, use liquid dishwashing detergent that contains anionic, nonionic, and amphoteric surfactants.

1. **Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

2. **Manufacturer:** Subject to compliance with requirements, provide products of one of the following:

a. Procter & Gamble Ivory Liquid
Cincinnati, Ohio 45202

B. **Waste Bag:** Large size heavy-duty impermeable trash bag made from 6 mil (0.15 mm) thick polyethylene. Identify with a label stating ADANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD.

C. **Waste Container:** Closed leak-tight container. Identify with a label stating ADANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD.

D. **Scrapers:** Broad stiff-bladed wall or floor scrapers. Heavy-duty short or long handled scraper.

E. **Cutting Sand:** No. 1 sandblasting sand (clean, sharp, coarse cutting sand).

F. **Terrazzo Floor Machine:** Terrazzo or low-speed floor machine fitted with a floor plate attachment (similar to Clark Assembly 500202-6).

G. **Removal Solution:** Solution used to remove adhesive residue. e.g. Mop on, mop off, no machine scrub - wax stripping solution.

H. **Floor Pad:** Black floor scrubbing pad.

I. **HEPA Filter Vacuum Cleaners:** Use wet/dry tank-type vacuum cleaner equipped with a filter and metal floor attachment (no brush).

1. **Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

2. **Manufacturer:** Subject to compliance with requirements, provide products of one of the following:

a. Nilfisk of America, Inc. — HEPA-Filtered Vacuums
225 Great Valley Parkway
Malvern, PA 19355
(800) 645-3475

b. Minuteman International, Inc. — Minuteman HEPA Vacuums
111 South Rohlwing Road
Addison, IL 60101
(708) 627-6900

c. Pullman-Holt (White) Corporation — HEPA-Filtered Vacuums
PO Box 16647
Tampa, FL 33617
(813) 645-3475

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J. **Thermal Equipment with Automatic Control:**

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

2. **Manufacturer:** Subject to compliance with requirements, provide products of one of the following:

a. Enviromethods, Inc. — "Delta T" series
P.O. Box 6151
Wolcott, CT 06716
203-879-5527

b. UAS Automation Systems, Inc. — "ATR" (Automated Tile Removal) series
4524 Parkway Commerce Blvd.
Orlando, FL 32808

K. **Miscellaneous Equipment:** Provide as needed the following equipment: utility or hook knife, ground fault circuit interrupter, hand sprayer, hammer or mallet, commercial-type, hand-held, hot-air gun or radiant heat source, hand-held rubbing stones, slip resistant shoes or boots, chisel, heavy gloves, duct tape, safety glasses.

L. **Use a Ground Fault Circuit Interrupter (GFCI)** for any electrical connections in a wet environment.

PART 3 - EXECUTION

3.1 GENERAL:

A. **Assume an asbestos content:** Unless indicated in the contract documents that a flooring material is a non-asbestos product, assume it contains asbestos and treat it in the manner prescribed by the following procedures which are based on the "Recommended Work Practices for the Removal of Resilient Floor Coverings," published by the Resilient Floor Covering Institute and Armstrong World Industries. Do not sand, dry sweep, dry scrape, drill, saw, beadblast, or mechanically chip or pulverize existing resilient flooring, backing lining felt or asphaltic Acut back adhesives.

B. **Before beginning removal** of any resilient flooring materials complete the following

3. **Negative Exposure Assessment:** Before starting any work require that a Competent Person make an Initial Exposure Assessment of the resilient flooring to be removed. Begin work only if the Competent Person makes a Negative Exposure Assessment. Based on data in the rulemaking record, OSHA has determined that worker exposures will consistently be below the TWA and excursion limit during removal of intact flooring material when compliant work practices are used. As such, a Competent Person may make a negative exposure assessment when:

   a. Recommended Work Practices will be used.
   b. Workers are properly trained.
   c. The resilient flooring is intact and is likely to remain intact throughout the removal process.

   If a Negative Exposure Assessment cannot be made, report the reasons and any corrective action that would result in a Negative Exposure Assessment.

4. **Notifications:** Before the start of Work notify the following of the presence and location of ACM and of the planned removal activity:

   a. Employees performing the work.
   b. Employers of employees working in the area (not separated from the work area by either a wall, closed door or window or other impermeable barrier).
   c. The building owner.

5. **Demarcation:** The work area must be demarcated or access must be limited to workers performing the removal. Post warning signs that read:

DANGER
ASBESTOS

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6. **Preparation:** Prior to beginning the removal of resilient floor covering complete the following:

   a. Remove appliances and furniture from the work area.
   b. Remove binding strips or other restrictive molding from doorways, walls, etc.
   c. Mix a detergent solution (16 ounces (0.473 liters) of liquid dishwashing detergent to 1 gallon (3.79 liters) of water) and pour into a garden sprayer.
   d. Clean the entire floor using a wet/dry vacuum cleaner equipped with a HEPA filtration system with disposable bag and metal floor attachment (no brush). Do not dry sweep; do not create dust.
   e. Precaution: Resilient flooring becomes slippery when wet with a detergent solution. Use caution to contain the solution in the immediate work area. Stand on a sheet of plywood or non-slip surface while working on wet surfaces.
   f. After vacuuming, used HEPA filters and cleaner bags should be removed according to manufacturer's instructions and place in a waste bag or waste container.

C. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.2 REMOVAL OF PERIPHERALLY-ADHERED RESILIENT SHEET VINYL FLOORING:

A. **Use the following procedures** to remove adhered portions of the sheet vinyl floor covering:

7. The manufacturer's recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

8. Make a slice with a sharp knife into the adhered floor covering 4 to 8 inches (102 to 203 mm) wide, parallel with the walls, around the perimeter of the room.

9. Starting on either side of the entrance door, pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

10. Roll the strip tightly as it is removed. Tie or tape securely and immediately place in a waste bag or waste container for disposal.

11. Remove all of the exposed residual felt by wet scraping, using the procedures under, "Wet Scraping Residual Felt," in this section, before proceeding with removal of the unadhered portion of the floor covering. Residual felt must be removed by wet scraping. Do not sand or dry scrape in any way. Do not dry sweep. Avoid creating dust.

12. Remove additional strips, following the above procedure, as necessary to expose unadhered subfloor area.

13. Continue around the room completely removing the adhered flooring along the perimeter, one strip at a time following the procedures above. Do not remove the flooring at the entrance doorway until all other flooring has been completely removed.

14. Vacuum up any residue of wet felt scrapings immediately with a wet/dry vacuum equipped with a HEPA filter and metal floor attachment (no brush).

15. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

16. Remove the unadhered flooring as detailed in the article in this Section on ARemoval of Unadhered Resilient Floor Covering.

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B. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.3 REMOVAL OF UNADHERED RESILIENT FLOOR COVERING:

A. **Use the following procedure** to remove loose laid or the unadhered portion of peripherally adhered sheet resilient floor covering:

1. The manufacturer's recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

2. Start at the end of the room farthest from the entrance doorway and slice a strip 18 inches (0.46m) wide in the unadhered flooring.

3. Remove the sliced strips while spraying the detergent solution into the separation nip point. Do not stand or kneel on the exposed subfloor during the removal process.

4. Roll the wet strip tightly and tie or tape to secure. Continue working toward the doorway, slicing each strip and removing it while spraying the separation nip point with the detergent solution. Place the strips while still wet into a waste bag or waste container.

5. After removing three strips of flooring, vacuum the exposed floor using a wet/dry vacuum equipped with a HEPA filter with metal floor attachment (no brush).

6. Seams and other adhered areas should be removed as they are encountered. Strip the wear surface while spraying the detergent solution into the delamination nip point. Wet scrape the residual felt as described under, "Wet Scraping Residual Felt" in this section.

7. Continue removing flooring, doing only one three-strip area at a time, until the entire floor has been completely removed.

8. When the whole floor has been completely removed, let it dry. Vacuum up any dust using a vacuum with a HEPA filtration system and a metal floor attachment (no brush). Stand only in vacuumed areas as work proceeds across the floor. Position the vacuum cleaner so that discharge air does not blow on the floor being cleaned. Do not dry sweep. Avoid creating dust.

9. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

10. When floor is dry, install new resilient floor covering following manufacturer's installation recommendations.

B. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material≡. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.4 REMOVAL OF ADHERED RESILIENT SHEET VINYL FLOORING:

A. **Use the following procedure** to completely remove adhered resilient sheet flooring.

1. The manufacturer's recommend that two workers be utilized to perform sheet flooring removal. The Contractor should consider the particular circumstances of the project and determine the advisability of requiring a minimum of two workers as a quality assurance measure.

2. Make a series of parallel slices, with a knife, 4 to 8 inches (102 to 203 mm) apart parallel to a wall.

3. Start at the end of the room farthest from the entrance door. Pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

4. Roll the strip tightly as it is removed. Tie or tape securely and immediately place in a waste bag or waste container for disposal.

5. If parts of the foam inner-layer remain stuck to the backing, attempt to eliminate this condition by pulling the strips loose from the opposite end. Peel the foam inner-layer from the floor while spraying the detergent solution into the delamination nip point.

6. Some resilient flooring is not readily strippable by hand. When these conditions are encountered, a sharp stiff blade scraper may be used to assist cleavage of the wear layer from felt. If this procedure is used the distance between slices must be narrowed to a width of 3 to 5 inches (76 to 127 mm).

7. Regardless of whether stripping of the wear surface is accomplished by hand peeling alone or with the assistance of a stiff blade scraper, detergent solution must be sprayed into the delamination nip point to minimize any airborne dust particles.

8. After removing three strips of the wear surface, remove the remaining residual felt by wet scraping using the procedures "Wet Scraping Residual Felt," in this section. During the stripping process, do not stand or walk on the exposed felt.

9. After removing the three strips of flooring and residual felt vacuum the exposed floor using a wet/dry vacuum equipped with a HEPA filter and metal floor attachment (no brush).

10. Repeat the operation (wetting the delamination nip point while removing the next three strips, then wet scrape the residual felt, then vacuum the exposed floor). Do only one three-strip area at a time until the entire floor has been completely removed.

11. Place all flooring strips and felt scrapings immediately while wet into waste bags or waste containers. Close full bags and containers tightly and seal securely for disposal.

12. Do not dry sweep. Avoid creating dust.

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13. When all floor covering has been completely removed, let the floor dry. Vacuum up any dirt using a vacuum with a HEPA filtration system and a metal floor attachment (no brush). Stand only in the vacuumed area as the work proceeds across the floor. Position the vacuum cleaner so the discharge air does not blow on the floor being cleaned.

14. After vacuuming, used HEPA filters and cleaner bags should be removed according to manufacturer's instructions and place in a waste bag or waste container.

15. When the floor is dry, it is ready to have a new resilient floor covering installed. Follow the floor covering manufacturer's instructions.

B. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.5 WET SCRAPING RESIDUAL FELT:

A. **Remove any residual felt** remaining on the floor after removal of the wear layer of adhered vinyl sheet flooring by using the following procedure:

1. Thoroughly wet residual felt with detergent solution. Avoid excessive wetting or standing water. Wait a few minutes to allow solution to soak into felt.

2. Stand on the remaining floor covering (not the felt) and use a stiff-bladed scraper or a floor scraper with a replaceable blade to remove the wet felt.

3. Re-wet the felt if the solution has not completely penetrated, if drying occurs or if dry felt is exposed during scraping. Scrape all felt from each three-strip area before proceeding further. Pick up the scrapings as they are removed from the floor and place in a waste bag or waste container.

4. Wet residual felt as above but do not excessively soak or flood wood floors with detergent solution. Excessive water can damage wood floors to the extent that new underlayment could be required. A floor that has been wet scraped must be allowed to dry thoroughly before new resilient flooring is installed.

5. As removal progresses, vacuum the area using a vacuum cleaner equipped with a HEPA filter and metal floor attachment (no brush).

6. After removal is complete and the entire floor has dried, vacuum using a HEPA vacuum with a metal floor attachment (no brush).

7. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

B. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.6 REMOVAL OF RESILIENT TILE FLOOR COVERING:

A. **Use the following procedure** to remove resilient tile floor covering:

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1. Begin removal in an area that receives the minimum foot traffic.

2. Floor tiles must be wetted (misted with a garden sprayer) before actual removal begins, unless heat will be used to remove tiles.

3. Start removal by carefully wedging a wall scraper in the seam of two adjoining tiles and gradually forcing the edge of one of the tiles up and away from the floor. Continue to force the balance of the tile up by working the scraper beneath the tile. Exert both a forward pressure and a twisting action on the blade to promote release of the tile from the adhesive and the floor.

4. When the first tile is removed place it, without breaking it further into smaller pieces, in a waste bag or waste container.

5. After the first tile is removed and accessibility to other tiles is improved, force the wall scraper under the exposed edge of another tile. Continue to exert a prying twisting force to the scraper as it is moved under the tile until the tile releases from the floor. Again, dispose of the tile, and succeeding tiles, by placing in a waste bag or waste container without additional breaking.

6. Force the scraper through tightly-adhered areas by striking the scraper handle with a hammer using blows of moderate force while maintaining the scraper at a 25 to 30 degree angle to the floor. The resilient floor covering manufacturer's work practices recommend use of safety goggles during this work.

7. Continue to wet (mist) the tiles throughout the procedure

8. It should be the goal to remove individual tiles as a complete unit, although breakage of tiles is unavoidable.

9. If the procedure above is inadequate to loosen tiles use heat to soften adhesive, or alternatively, without first prying up floor tiles using a scraper, thoroughly heat the tile(s) with a hot air gun or radiant heat source until the heat penetrates through the tile and softens the adhesive, and remove tiles by hand or by using a scraper. The resilient floor covering manufacturers work practices recommend that the hot air gun or radiant heat source, tiles and adhesive be carefully handled to avoid burns, and that heated tiles and adhesive be handled only with suitable glove protection for hands. Caution: Over-heating resilient tile might produce harmful vapors, and a respirator with organic cartridges might be needed.
10. Deposit tiles in a waste bag or leak-tight container. Do not attempt to break tiles after they are in bag.

B. **Wet Scrape Residual Adhesive:** As small areas of subfloor are cleared of tile, wet scrape residual asphaltic Acut-back adhesive so that no ridges or puddles are evident and what remains is a thin, smooth film.

1. Start in the corner of the room farthest from the entrance door and moisten an area of the adhesive (approximately 3 by 10 feet) (0.91m by 3.05m) with water mixed with liquid dishwashing detergent (to aid in wetting the adhesive). Wet scrape with a stiff-bladed wall or floor scraper removing ridges and any loose adhesives.

2. Place loosened adhesive residues into a waste bag or waste container

3. Wet vacuum standing water with HEPA wet/dry vacuum.

4. Continue the above steps until what remains of the residual asphaltic Acut-back adhesive is a thin, smooth film.

C. **Wet Remove residue of adhesive from Concrete:** Completely remove residue of adhesive left after removal of resilient floor tile using the following procedure:

1. Place cutting sand (enough to cover an area of approximately 6 by 6 foot (1.83 by 1.83 m) into a container, add water mixed with liquid detergent (1 ounce (30 ml) of liquid dishwashing detergent to 1 gallon (3.79 liters) of water) to dampen the sand (20 pounds (9.07 kg) of sand to 2 gallon (1.89 liters) of solution).

2. Place sand over a 6 by 6 foot (1.83 by 1.83 m) area and wet remove the existing adhesive residue using a terrazzo floor machine. Keep sand under rubbing stones when operating the machine. The sand and subfloor must be continuously kept wet.

3. Occasionally push away cutting sand from the subfloor with a wall or floor scraper to check for complete removal.

4. Remove adhesive around the edge of the room and missed areas with dampened, clean, sharp, cutting sand and a hand held rubbing stone.

5. Wet-scrape sand into a pile using a stiff-bladed floor or wall scraper and place sand and adhesive residue in a waste bag or waste container.

6. Rinse area with clear clean water using a hand sprayer. Worker's boots should also be rinsed and cleaned.

7. Wet-vacuum standing water with HEPA wet/dry vacuum with a metal floor attachment (no brush).

8. Continue with the above steps until the entire room is complete.

9. Allow sub-floor to dry and vacuum up any remaining dirt or sand using a vacuum equipped with a HEPA filter and metal floor attachment (no brush).

10. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

11. Wet-wipe and/or wash down all equipment used during the work.

D. **Wet Remove residue of adhesive from Concrete:** Completely remove residue of adhesive left after removal of resilient floor tile using the following procedure:

1. Start in the corner of the room farthest from the entrance door . Put the removal solution onto the residual adhesive with a hand sprayer or mop over a 6' X 6' (1.82m X 1.82m) Put enough removal solution (e.g. Amop on, mop off, no machine scrub≅ stripping solution) to ensure that the area is thoroughly wet. Allow the area to soak for 5-10 minutes. Remove the adhesive using a floor machine equipped with a black floor pad (or equivalent). The subfloor must be kept continuously wet.

2. Occasionally push away the adhesive slurry from the subfloor with a wall or floor scraper to check for complete removal. Continue to use the floor machine, equipped with the black pad, in the same area until the concrete subfloor is cleaned to the desired degree.

3. Remove adhesive around the edge of the room, from missed areas, and from areas difficult to reach with the machine with a hand held piece of the black floor pad using the above procedure.

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4. Wet HEPA vacuum the adhesive slurry. When the HEPA vacuum is full, place a commercially suitable water absorbent into the HEPA container until the adhesive slurry is absorbed. Place adhesive waste in a waste bag or waste container.

5. Rinse area with clear clean water using a hand sprayer or mop. Worker=s boots should also be rinsed and cleaned.

6. Wet-vacuum standing water with HEPA wet/dry vacuum with a metal floor attachment (no brush).

7. Continue with the above steps until the entire room is complete.

8. Allow subfloor to dry and vacuum using a vacuum equipped with a HEPA filter and metal floor attachment (no brush).

9. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

10. Wet-wipe and/or wash down all equipment used during the work.

E. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material≅. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.7 REMOVAL OF THIN WOOD UNDERLAYMENT:

A. **Thin wood underlayment covered with existing sheet vinyl**. Remove thin wood underlayment covered with existing sheet-vinyl-resilient flooring, with the flooring adhered. Use the following procedure:

1. Locate the joints of the underlayment panel farthest from the entrance door.

2. Slice a strip of the flooring 4 to 8 inches (102 to 203 mm) wide centered over the underlayment joint in the panel being removed.

3. Pry up the corner of the strip separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.

4. Roll the strip tightly as it is removed. Tie or tape securely and place in a waste bag or waste container for disposal.

5. Remove all of the exposed residual felt by wet scraping using the procedures of, "Wet Scraping Residual Felt," in this section before proceeding.

6. Drive a cold chisel using a hammer or mallet into the joint at a corner of the panel. Now use the chisel to pry the panel up far enough to insert a pry bar. Continue working around the panel, lifting all edges slowly. Use one or two pry bars to pry up the underlayment panel a little at a time until the panel is completely loose and can be removed. Attempt to remove the panel in one piece.

7. If the panel breaks, slice the resilient flooring at the break and spray the detergent solution onto the exposed felt. Allow the solution to penetrate for a few minutes, then continue lifting the broken underlayment.

8. Remove each underlayment panel or piece from the work areas as it is lifted. The resilient floor covering manufacturers work practices recommend that workers wear heavy gloves when handling removed panels, and be very careful of wood splinters and protruding fasteners. Flatten the fasteners with a hammer and stack the panels back to back on pallets or place in dumpster. Identify panels with a label stating, ADANGER, CONTAINS ASBESTOS FIBERS, AVOID CREATING DUST, CANCER AND LUNG DISEASE HAZARD. Dispose of in an approved landfill only.

9. Place any small wood or flooring scrapes in a waste bag or waste container.

10. If the underlayment extends under cabinets or wall partitions, slice through the flooring with a knife as close to the vertical surface as possible, deeply scoring the panel.

11. After each panel has been lifted and removed from the work area, pull up any remaining nails or fasteners in the subfloor.

12. Continue removing each underlayment panel in sequence following the above procedures.

13. When the underlayment / resilient flooring removal is complete, vacuum with a HEPA filter and metal floor Attachment (no brush).

14. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

B. **Removal of thin wood underlayment covered with existing tile.** Remove the underlayment with the tile adhered using the following procedure:

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1. Floor tiles must be wetted (misted with a garden sprayer) before actual removal begins, unless heat will be used to remove tiles.

2. Starting at the doorway or a floor ventilation vent, locate a joint in an underlayment board.

3. Start removal by carefully wedging a wall scraper in the seam of two adjoining tiles and gradually force the edge of one of the tiles up and away from the floor. Continue to force the balance of the tile up by working the scraper beneath the tile. Exert both a forward pressure and a twisting action on the blade to promote release of the tile from the adhesive and the floor.

4. When the first tile is removed place it, without breaking it further into smaller pieces, in a waste bag or waste container.
5. After the first tile is removed and accessibility to other tiles is improved, force the wall scraper under the exposed edge of another tile. Continue to exert a prying twisting force to the scraper as it is moved under the tile until the tile releases from the floor. Again, dispose of the tile, and succeeding tiles, by placing in a waste bag or waste container, without additional breaking.

6. Force the scraper through tightly adhered areas by striking the scraper handle with a hammer using blows of moderate force while maintaining the scraper at a 25 to 30 degree angle to the floor. Use eye protectives and other protective equipment required for the work.

7. Continue to wet (mist) the tiles throughout the procedure.

8. It should be the goal to remove individual tiles as a complete unit, although breakage of tiles is unavoidable.

9. If the procedure above is inadequate to loosen tiles use heat to soften adhesive. Thoroughly heat the tile(s) with a hot air gun or radiant heat source until the heat penetrates through the tile and softens the adhesive. The resilient floor covering manufacturers work practices recommend that the hot air gun or radiant heat source, tiles and adhesive be carefully handled to avoid burns, and that heated tiles and adhesive be handled only with suitable glove protection for hands.

10. After all tiles have been removed from the underlayment joints, drive a chisel, using a hammer or a mallet, between the underlayment board and the subfloor. Use the chisel to pry up the underlayment enough to insert a pry bar and remove the chisel. Slowly and carefully use pry bars to pry up the underlayment board a little at a time until the board is completely loose and can be removed.

11. Use caution to avoid breaking the underlayment board. The underlayment board should be removed in one piece. If the underlayment board breaks, heat and slice the tile at the break, then continue to remove broken underlayment.

12. The Resilient floor covering manufacturers work practices recommend that workers wear heavy gloves and be careful of wood splinter and fasteners sticking out the back of the underlayment. Remove each underlayment board (or piece of board) from the work area as soon as it has been pried up to avoid injuries (such as stepping on a nail). Flatten with a hammer fasteners protruding from a removed board. Place removed underlayment boards on skids with the nails pointing downward. Wrap skid with 6 mil (0.15 mm) polyethylene sheet plastic and secure with duct tape. Label panels in the same manner as waste bags.

13. After each board has been removed, pull out any nails or fasteners still in the subfloor. Dispose of these and any other nails or fasteners which have been removed but are still lying in the work area.

14. After the first board has been removed a chisel is not needed to start removal of boards. Work pry board under the exposed edge of the next board.

15. When removal of underlayment/existing tile floor is complete, thoroughly check the exposed subfloor. Re-nail loose areas and reset "popped" nails and fasteners.

16. Vacuum up any dirt in the area using a vacuum cleaner equipped with a HEPA filter and metal floor attachment (no brush).

17. After vacuuming, used HEPA filters and cleaner bags should be removed according to the manufacturer's instructions and placed in a waste bag or waste container.

C. **Disposal of materials:** Dispose of friable materials in accordance with Section 02084 ADisposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

END OF SECTION - 02085

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02086
Hazardous Waste Management

BrightFields, Inc.
Environmental Services

SECTION 02086 - HAZARDOUS WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

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1.2 RELATED SECTIONS

A. **Section 01092 Codes and Regulations - Asbestos Abatement** describes federal, state and local regulations applicable to asbestos.

B. **Section 02084 Disposal of Regulated Asbestos-Containing Material** describes the handling and disposal of asbestos-containing waste.

1.3 DESCRIPTION OF THE WORK:

A. **This section describes** the segregation, packaging, labeling, transport, and disposal of waste materials generated by demolition activities and the subsequent shipment of properly packaged and labeled waste materials to an approved disposal site.

1.4 CODES AND REGULATIONS

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

B. **Contractor Responsibility:** The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to hazardous waste management and disposal. Hold the Owner and Designer harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of the Contractor, the Contractor's employees, or Subcontractors.

C. **Federal Requirements:** which govern the management, hauling and disposal of hazardous waste include but are not limited to the following:

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

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

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

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

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

a. Management of Hazardous Wastes Resource Conservation and Recovery Act (RCRA)
Title 40, Parts 260- 268 of the Code of Federal Regulations

D. **State Requirements:** Abide by all state requirements which govern the management, hauling and disposal of hazardous waste.

E. **Local Requirements:** Abide by all local requirements which govern the management, hauling and disposal of hazardous waste.

1.5 DEFINITIONS:

A. **Toxicity Characteristic Leaching Procedure (TCLP):** A laboratory test method to determine the mobility of both organic and inorganic analytes present in liquid, solid, and multiphasic wastes performed in accordance with test methods required under 40 CFR Part 268.

1.6 SUBMITTALS:

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

1. **Copy of state and local licenses** for waste hauler.

2. **U.S. EPA Identification Number** of waste hauler.

3. **Name and address of waste disposal facility** where hazardous waste materials are to be disposed including:

   a. Contact person and telephone number.

   b. Copy of state license and permit

   c. Disposal facility permits

4. **Specimen copy** of Uniform Hazardous Waste Manifest form.

5. **Copy** of EPA ANotice of Hazardous Waste activity≅ form

6. **Copy** of forms requires by state and local agencies

7. **Sample** of disposal label to be used.

B. **During Work:** Submit the following as required by the work.

1. **TCLP test results**, as required to characterize waste for segregation and packaging purposes.

2. **Submit copies** of all executed manifests and disposal site receipts to the Designer.

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PART 2 - PRODUCTS:

2.1 MATERIALS

A. **Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags.

B. **DOT Hazardous Waste Disposal Drums:** Provide DOT 17-H Open -Top Drums (55 gallon) in accordance with DOT regulations title 49 CFR Parts 173, 178, and 179.

C. **DOT Hazardous Waste Labels:** in accordance with DOT regulations Title 49 CFR parts 173, 178, and 179.

PART 3 - EXECUTION

3.1 GENERAL

A. **Do not mix potentially hazardous waste streams.** Where feasible, separate each type of hazardous waste from other types of hazardous wastes, from asbestos waste and from construction waste.

B. **Segregate, package, label, transport and dispose** of Hazardous Waste in accordance with DOT, EPA, State and Local regulations.

3.2 HAZARDOUS WASTE DESIGNATION

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A. **Where not otherwise designated** by the Owner as Hazardous waste, characterize all suspect waste products by conducting representative TCLP testing.

B. **Testing of components by use of TCLP** was completed by Owner's consultant prior to initiating this project.

1. A schedule of materials that must be managed as hazardous waste is attached at the end of this section.

2. Additional TCLP testing obtained at the site for contractor's use in fulfilling waste management requirements is at contractor's expense.

C. Representative sampling of waste products will be in accordance with EPA Document SW 846.

D. TCLP test analysis will be performed in accordance with EPA Method 1311.

3.3 HAZARDOUS WASTE:

A. The following waste products are designated by the Owner as non-salvageable and as Hazardous Waste Types, example list:

1. **Waste Type A:** PCB waste.

   a. PCB-containing ballasts from fluorescent light fixtures.

2. **Waste Type B:** Mercury-containing waste.

a. Thermostats with mercury switches. Individually bagged mercury-containing thermostats.

b. Fluorescent, and mercury-vapor lamps.

3.4 **Hazardous Waste Packaging and Labeling:** Package each segregated Hazardous Waste Type , A and B, in specified containers as follows. **IMPORTANT: Do Not Mix Waste Streams:**

A. Waste Type A

1. Package in DOT 17-H Open-Top Drums

2. Fill to capacity only with Waste Type A (Do Not Mix Waste Stream types).

3. Install gasket on lid, apply lock ring, and seal.
4. Apply Hazardous Waste Label to drum side.

5. Enter DOT Shipping Data as follows: RQ Waste Polychlorinated Biphenols, 9, UN-2315, PG-II, (M001).

6. Adjacent to each label, enter the date indicating when waste was first placed in each drum.

B. Waste Type B

1. Package in DOT 17-H Open-Top Drums with Polyethylene disposal Bag liners

2. Fill liner bags only with Waste Type B (Do Not Mix Waste Stream types); then neck liner bags down into DOT 17-H Open-Top Drum and seal with duct tape.

3. Install gasket on lid, apply lock ring, and seal.

4. Apply Hazardous Waste Label to drum side.

5. Enter DOT Shipping Data as follows: RQ Hazardous Waste Solid, NOS, 9, NA3077, PG-III, (D009).

6. Adjacent to each label, enter the date indicating when waste was first placed in each drum.

C. Sealed and Labeled Containers: maintain all containers in a continuously sealed condition after they have been sealed.

1. Do not reopen sealed containers.

2. Do not place additional waste in sealed containers.

3.5 Temporary Storage: Partially filled containers of hazardous waste may be stored at the work site for intermittent packaging provided that:

A. Each container is properly labeled when it is first placed in service;

B. Each container remains closed at all times except when compatible waste types are added; and

C. When moved from site to site, each container remains within the geographic boundaries of the facility without moving nor crossing public access highways.

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3.6 Removal of Hazardous Wastes: Immediately seal containers of hazardous waste as each the container is filled. Remove containers of hazardous waste from the work site **within seventy-two (72) hours of being filled.**

A. **Transporting filled containers** from the work site to an approved disposal site or recycling center.

B. **Continuously maintain custody** of all hazardous material generated at the work site including security, short-term storage, transportation and disposition until custody is transferred to an approved disposal site or recycling center. Document continuous chain-of custody.

C. **Do not remove**, or cause to be removed, hazardous waste from Owner=s property without a legally executed Uniform Hazardous Waste manifest .

D. **At completion of hauling** and disposal of each load submit copy of waste manifest, chain of custody form, and landfill receipt to Designer.

3.7 Recycling and Recovery: Turn over waste which contains materials for which recovery and/or recycling is possible to an approved recycling center. Materials subject to recycling include, example list:

1. Fluorescent light tubes.

2. Thermostats with mercury switches.

3. Lead acid batteries

4. Combustible lead-based painted building components and lead-based paint chips.

3.8 Backcharges:

A. Where contractor fails to fulfill packaging, handling, transport or disposal requirements as outlined herein, Owner will charge back to the Contractor all costs associated with insuring that hazardous wastes are segregated, packaged, transported and disposed of in accordance with all applicable Federal and State regulations.

B. Environmental pollution of Owner's property or other environments resulting from Contractor's hazardous waste management activities will be promptly remediated under Owner's direction, to the Owner's sole satisfaction, and at the Contractor's sole expense.

C. Contractor agrees to either reimburse the Owner, or reduce the Contract amount by change order to cover all costs associated with waste re-packaging, waste re-segregation, or pollution remediation efforts.

3.9 Removal of Non-Hazardous Waste Materials:

A. Transport and legally dispose of non-hazardous waste products, materials, residues and refuse at a location not on Owner's property.

B. Non-hazardous waste products, materials, residues and refuse include, but are not necessarily limited to:

1. Materials which are determined to be non-hazardous wastes through objective sampling in accordance with EPA Document SW-846 and laboratory analysis in accordance with EPA Method 1311.

2. Emptied hazardous material containers: containers holding a material with constituents listed on the MSDS as hazardous.

a. When a container is emptied of its hazardous contents by pouring or scraping so that less than one inch of material remains in the bottom of the container, the container is considered Aempty≅ and is not in itself a hazardous waste.

b. Emptied hazardous material containers may be disposed of as construction debris waste (i.e. non-hazardous).

3. Personnel protective clothing and safety equipment with de minimis or trace contamination, as determined by visual inspection by Owner's Representative.

C. Keep premises in a clean and orderly condition during performance of abatement work.

D. Place non-hazardous construction debris wastes on a daily basis in secure containers for local landfill disposal.

END OF SECTION - 02086

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BrightFields, Inc.

02087
Resilient Flooring Removal – Aggressive Asbestos Abatement

BrightFields, Inc.
Environmental Services

SECTION 02087 - RESILIENT FLOORING REMOVAL - AGGRESSIVE ASBESTOS ABATEMENT:

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

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1.2 RELATED WORK SPECIFIED ELSEWHERE:

A. Asbestos abatement project requirements to be completed prior to start of the work of this section are set forth in the following sections:

1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential & Air Circulation System
3. 01526 Temporary Enclosures - Complete Work Except Delete Floor Plastic.
4. 01527 - Regulated Areas
5. 01560 Worker Protection - Asbestos abatement
6. 01562 Respiratory Protection
7. 01563 Decontamination Units

B. Asbestos abatement project requirements to be completed at completion of the work of this section are set forth in the following sections:

1. 01711 Project Decontamination

1.3 SUBMITTALS:

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

1. Wetting Materials: Submit product data, use instructions and recommendations from manufacturer of wetting material (surfactant and/or removal encapsulant) intended for use. Include data substantiating that material complies with requirements.

2. NESHAP Compliance Documentation: Submit manufacturer's documentation for removal encapsulants proposed for use that, to the extent required by this specification, the material, if used in accordance with manufacturer's instructions, will comply with the wetting requirements of National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M).

3. NESHAP Compliance Documentation: Submit written approval from the EPA NESHAP Coordinator, in compliance with applicable requirements of National Emission Standard for Hazardous Pollutants (NESHAP) Asbestos Regulations (40 CFR 61, Subpart M), for the use of shot/bead blast equipment for adhesive removal.

4. Plan of Action for Dry Ice Use: Submit a plan of action as required by this section for protection of workers from carbon dioxide and cold hazards associated with use of dry ice. Testing and protective measures proposed are to be certified by a Certified Industrial Hygienist (CIH) as defined in Section 01097 "Definitions & Standards - Asbestos Abatement".

5. Adhesive Removal Solvent: Submit product data, use instructions and recommendations from manufacturer of adhesive removal solvent intended for use. Include data substantiating that material complies with requirements.

B. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been Received or Not Reviewed.
   1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for all materials proposed for use on the work including:
      a. Surfactants.
      b. Adhesive Removal Solvents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Wetting Materials:** For wetting prior to disturbance of asbestos-containing materials use:

1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the asbestos-containing material (ACM) and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

2. Removal Encapsulant: Provide a penetrating-type encapsulant designed specifically for removal of ACM. Use a material which results in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of 50 percent polyoxyethylene ester and 50 percent polyoxyethylene ether mixed with five gallons (19 liters) of water.

3. Dishwashing detergent that contains anionic, nonionic, and amphoteric surfactants.

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B. **Foam or Viscous Liquid:** Provide material that contains no organic materials, is non-flammable, presents no physical hazard due to reactivity, presents no acute or chronic health hazard, and does not require special skills, knowledge, or equipment for application.

C. **Tile Adhesive Removal Solvent:** Provide a slow-drying solvent intended to remove tile adhesive. Provide material that is not flammable, does not create combustible vapors and has no significant inhalation hazard.

1. Provide materials that have less than 250 g/l of volatile organic solvents (VOCs).

D. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick , clear, frosted, or black as indicated.

E. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (50 or 75 mm) widths as indicated, with an adhesive formulated for use on sheet polyethylene.

F. **Spray Cement:** Provide, in aerosol cans, spray adhesive which is formulated for use on sheet polyethylene. Provide materials that do not contain methylene chloride.

G. **Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

H. **Fiberboard Drums:** Provide heavy duty leak-tight fiberboard drums with tight sealing locking metal tops.

I. **Steel Drums:** Provide leak-tight steel drums with tight-sealing locking metal tops.

J. **Injection Molded Plastic Drums:** Provide leak-tight injection-molded plastic drums with tight sealing locking tops.

K. **Paper board Boxes:** Provide heavy-duty corrugated paperboard boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

L. **Polyethylene Boxes:** Provide heavy-duty polyethylene boxes. Provide leak-tight boxes or boxes in sizes that will easily fit in disposal bags.

2.2 PRIMARY RESILIENT FLOORING REMOVAL EQUIPMENT

A. **Manual Spades:**

1. Hand operated scraper/chisels with long handles and replaceable blades for removal of resilient flooring.

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

3. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a.	Crain Cutter Co., Inc. 156 So. Milpitas Blvd. Milpitas, CA 95035 408-946-6100	Various manual scrapers/strippers
b.	Beno J. Gundlach Company P.O. Box 544 Belleville, IL 62222 618-233-1781	Various manual scrapers/strippers
c.	Roofing Equipment, Inc. 11075 East 47th Avenue Denver, CO 80239	Taylor Tools "Spud Bar" and other manual scrapers/strippers

d. Red Devil, Inc. "The Slam Scraper"
2400 Vauxhall Road
Union, NJ 07083-1933
201-688-6900 or 800-4-A-DEVIL

B. Powered Spades:

4. Long-handled scraper/chisels used in a full-standing position that have replaceable blades and are pneumatically or electrically-powered to move in a reciprocating (in and out) motion.

5. Provide powered spades that are equipped with pneumatic vents and piston seals that prevent compressed air or blow by from sweeping floor.

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

7. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a. Aramsco "Air Powered Tile Removal System≅
1655 Imperial Way - hose
Thorofare, NJ 08086 - compressor
800-666-6933 - spade, chisel

b. Equipment Development Co., Inc. "A-LR-5"
100 Thomas Johnson Drive
Frederick, MD 21701
301-663-1600 or 800-638-EDCO

C. Stripper Machines:

8. These are walking units with blades at the front, driven by electric motors, and move either in a reciprocating (in and out) or an oscillating orbital motion.

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

10. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a.	Crain Cutter Co., Inc. 156 So. Milpitas Blvd. Milpitas, CA 95035 408-946-6100	No. 700 "Bearcat" Stripper - without blades - various blades available
b.	Beno J. Gundlach Company P.O. Box 544 Belleville, IL 62222 618-233-1781	No. 500 No. 525
c.	Inventive Manufacturing 1440 South Seneca Wichita, KS 67213 316-267-2443	"The Big Rip-Off"
d.	Palmer Distributing & Sales Co. P.O. Box 6327 Glendale, CA 91225-0327 818-244-7261 or 800-423-2733	Model 460 Model PG 101 Model PG 102
e.	Roofing Equipment, Inc. 11075 East 47th Avenue Denver, CO 80239 303-371-7667	Taylor Tools
f.	Warner Manufacturing 13435 Industrial Park Blvd. Minneapolis, MN 55441 612-559-4740 or 800-328-0606	No. 7079 Warner Floor Stripper

D. Rotary Cutters:

11. Machine with rotating discs facing flat against the floor with spring-loaded cutters that follow the profile of the floor and removes soft resilient materials by cutting them into thin strips and scraping them from the floor.

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

13 Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a. Critical Industries, Inc.
5815 Gulf Freeway
Houston, TX 77023
800-624-7030
AStrip-Dek"fitted for connection to HEPA Vac

b. Equipment Development Co. Inc.
100 Thomas Johnson Drive
Frederick, MD 21701
301-663-1600 or 800-638-EDCO
"Strip-Dek"

c. Roofing Equipment, Inc.
11075 East 47th Avenue
Denver, CO 80239
303-371-7667
Taylor Tools "Scrape Away"

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E. Shot Blast/Bead Blast Machines:

14. Machines that send steel shot at high velocity at the floor surface, arranged to provide a high-vacuum flow in the blast region to collect dust. Exhaust air is filtered through a HEPA filter. Shot is recollected, separated, and recycled continuously.

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

16. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a. Goff Corporation
One Pleasant Grove Road
Seminole, OK 74866
405-382-6900
HEPA filter on turret model only

b. Inventive Machine Corporation
P.O. Box 369
Bolivar, OH 44612
216-874-4222 or 800-325-1074
"Blast N' Vac"

c. Nelco Mfg. Corp.
6215 Aluma Valley Drive
Oklahoma City, OK 73121
405-478-3440
JJ2000
EC72

d. Wheelabrator Corporation "Blastrac"
1606 Executive Drive - seven models
La Grange, GA 30240
1-800-544-4144

2.3 THERMAL EQUIPMENT WITH AUTOMATIC CONTROL:

A. Thermal Equipment with Automatic Control:

17. Equipment utilizing controlled infrared radiant heat to make the resilient floor tiles and adhesive soft and pliable for removal.

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

19. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a. Enviromethods, Inc. "Delta T" series
P.O. Box 6151
Wolcott, CT 06716
203-879-5527

b. UAS Automation Systems, Inc. "ATR" (Automated Tile Removal)
4524 Parkway Commerce Blvd. series
Orlando, FL 32808
407/294-8551 or 800/969-8837

2.4 HIGH PRESSURE WATER JET:

A. High Pressure Water Jet

20. Tools using very high pressure water jets to hydraulically lift tiles.

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

22 Manufacturer: Subject to compliance with requirements, provide products of one of the following:

a.	Flow Systems, Inc. 21440 68th Ave. South Kent (Seattle), WA 98032 206-872-4900	Operating pressures of 35,000 psi (240 Pa) and up 0-5.6 g.p.m. and up

2.5 OTHER TECHNOLOGIES APPLIED TO THE WORK:

A. Rotary Grinders/Surfacers:

23. Machine with discs facing flat against the floor that removes hard materials with a grinding action.

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

25.a Manufacturer: Subject to compliance with requirements, provide products of one of the following:

b.	Allen Engineering Corporation P.O. Box 819 Paragould, AR 72451 501-236-7751 or 800-643-0095	No. 021006 grinders; diamond (wet cut) with dust extraction kit - gasoline, electric, propane
c.	Equipment Development Co. Inc. 100 Thomas Johnson Drive Frederick, MD 21701 301-663-1600 or 800-638-EDCO	EDCO grinders diamond (wet cut) w/HEPA vac connectors models: SEC, 2EC, 2GC, 411

B. Surfacers/Planers/Scarifiers:

26. Machine with a series of small cutters freewheeling on axles mounted on a drum so that the cutters contact the floor surface with a flailing action.

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

28 Manufacturer: Subject to compliance with requirements, provide products of one of the following:

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a.	Allen Engineering Corporation P.O. Box 819 Paragould, AR 72451 501-236-7751 or 800-643-0095	"Thunderbird 8" planer w/dust extraction kit "Multi-Duty Planer" diamond head grinder with dust extraction kit
b.	Aurand 1210 Ellis Street Cincinnati, Ohio 45223 513-541-7200	Handheld units (no vac) and small walking units
c.	Bartell Power Products 56 Harvester Avenue Batavia, NY 14020 716-344-0850 or 800-247-8577	"Surface Preparation System" - machine and cutter individually sold Handheld units (2" path, no vac) models SP86, SP86E Walking units (8" path) with dust extractor models B446, 436, 346
d.	Equipment Development Co. Inc. 100 Thomas Johnson Drive Frederick, MD 21701 301-663-1600 or 800-638-EDCO	EDCO various Surfacers/Planers with HEPA vacs - models CPM 4, 8, CPU 10, 10C, 12
e.	SASE Company P.O. Box 81003 Seattle, WA 98108 206-762-0744	VON ARX various Surfacers/Scarifiers

PART 3 - EXECUTION

3.1 RESILIENT FLOOR COVERINGS:

A. **Pre-requisite activities:** Before starting removal of ACM using the procedures of this section complete work of the following sections:

29. 01503 Temporary Facilities - Asbestos Abatement
30. 01513 Temporary Pressure Differential & Air Circulation System
31. 01526 Temporary Enclosures - Complete work except delete floor plastic.
32. 01527 - Regulated Areas
33. 01560 Worker Protection - Asbestos abatement
6. 01562 Respiratory Protection
7. 01563 Decontamination Units

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B. **Preparation:** Prior to beginning the removal of any resilient floor covering complete the following:

34. Remove appliances and furniture from the work area.

35. Mix a detergent solution (16 ounces (0.5 liters) of liquid dishwashing detergent to 1 gallon (4 liters) of warm water) and pour into a garden sprayer.

C. **Seal Floor Penetrations:** Before using wet methods to remove resilient flooring, seal openings, and penetrations in the floor to prevent water leakage.

1. Remove surface mounted junction boxes (doghouses) from raceway system.
2. Remove hatch and trench covers that are covered with resilient flooring. Seal opening with plywood. Seal edges of plywood to floor with urethane foam caulk. Remove resilient flooring from cover in a later operation during wet removal of flooring.
3. Seal openings with a wooden or plywood plug. Seal with urethane foam caulk.
4. Remove flooring material in the immediate area of floor penetrations with a hand spade or scraper.
5. Remove adhesive by hand scraping as necessary to permit installation of seals.
6. Remove any adhesive residue from slab where cover on openings and penetrations must seal to floor to accomplish a water tight assembly. Remove this residue by abrasion using dampened, clean, sharp, cutting sand and a hand-held rubbing stone as necessary. Use minimum wetting required to permit removal. Use caution to prevent water leakage into opening or penetration.
7. Cover sealed plywood hatch assemblies with 6 mil (0.15 mm) sheet plastic. Seal plastic to floor with spray glue or urethane caulk.
8. Cover sealed openings with sheet plastic. Seal plastic to floor with spray glue or urethane caulk.

D. **Remove Resilient Flooring:** Use the three step process described in the following sections:

36. First Step: "Removal of Resilient Tile Floor Covering," and/or " Removal of Resilient Sheet Flooring." This step involves removal of tiles or the wear layer of sheet flooring using a powered spade or stripper machine.
37. Second Step: "Removal of Heavy Residue of Adhesive" and/or "Removal of Residual Backing." This step involves the use of a rotary cutter to remove the bulk of these residual materials. As an alternative hand scraping can be used for this purpose.
38. Third Step: "Removal of Adhesive Residue." After completion of the first two steps there will be a thin residue of adhesive left on the floor. This is removed using a shot/bead blast machine. If the thickness of adhesive residue is too thick to permit effective use of the shot/bead blast machine, repeat the second and third steps.
39. At the completion of all work, leave the substrate in such a state as to comply with all requirements and recommendations of manufacturer of replacement flooring.

3.2 STEP ONE REMOVAL OF RESILIENT TILE FLOOR COVERING:

A. **Remove resilient tile floor covering using the following procedure:**

40. General:
    a. Remove binding strips or other restrictive molding from doorways, walls, etc. clean and dispose of as non-asbestos waste. Dispose of any materials that have glue or floor mastic on them as asbestos-containing waste.

41. Wet Floor:
    b. Wet floor with amended water, removal encapsulant, or detergent solution, so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions. Cover with sheet polyethylene to allow humidity to release tile from floor. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.
    c. Keep floor continuously wet throughout removal operation.
    d. Remove tiles using a manual or powered spade, or stripping machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet. Keep floor where tile has been removed continuously wet until after completion of heavy adhesive residue removal.

42. Foam or Viscous Liquid:
    a. Distribute dry foam in a uniform manner over floor. Use sufficient powder to form 1 inch (25 mm) of foam. Wet powder to produce foam. Add additional powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

b. Remove tiles using a manual or powered spade, or stripping machine. Add additional dry foam powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process. Maintain layer of foam on floor where tile has been removed until after completion of heavy adhesive residue removal.

B. Debris and Waste

1. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material . Dispose of Category I non-friable waste in accordance with State and Local Regulations.
2. Shovel broken tiles and debris into cardboard boxes that are placed in a disposal bag, or place directly in steel leak-tight drums.
3. Place bagged waste in a second disposal bag during decontamination and dispose of waste as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

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C. Dry Ice: Place block (approximately 20 pounds (9 kg)) of dry ice on tile to be removed. Allow to remain in place until the bond between the floor and tile is broken. Do not allow dry ice to remain in one location for more than 15 minutes to avoid frost damage to substrate. Relocate dry ice block to next location to be removed. Store dry ice in ice chest when not in use. Require that workers use insulated gloves while handling dry ice. Provide adequate ventilation to prevent a build up of carbon dioxide in the work area. Use exhaust-type ventilation as described in Section 01513 Pressure Differential and Ventilation System. Do not use a recirculation ventilation system. Provide at a minimum one air change per hour for each block of dry ice in use. Use no more that one block of dry ice per 100 square feet (30 sq meters) of work area.

1. Develop a plan of action for preventing a hazard from carbon dioxide and cold. Include in this plan of action: a description of type, location, and frequency of air testing that will be performed to detect in advance workers potentially overexposed to carbon dioxide; stop work and evacuation levels, method of correcting and preventing high carbon dioxide levels; protective equipment and work methods to prevent frost bite and protect workers from cold. Automatically and voluntarily stop work and evacuate the work area if a stop work level is measured, or if requested by the owner's representative on the basis of potentially high carbon dioxide levels. If a stop work has occurred, do not restart work until a method has been developed to control carbon dioxide levels and written authorization has been given by the Designer.

3.3 STEP ONE - REMOVAL OF ADHERED SHEET RESILIENT FLOORING:

A. Use the following procedure to remove adhered resilient sheet flooring completely:

1. Wet Floor

a. Wet floor with amended water, removal encapsulant, or detergent solution so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions.
b. Keep floor continuously wet throughout removal operation.
c. Remove wear layer using a manual or powered spade, or stripping machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet. Keep floor where wear layer has been removed continuously wet until after completion of heavy residue removal.

2. Foam or Viscous Liquid
   a. Distribute dry foam in a uniform manner over floor. Use sufficient powder to form 1 inch (25 mm) of foam. Wet powder to produce foam. Add additional powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.
   b. Remove wear layer using a manual or powered spade, or stripping machine. Add additional dry foam powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process. Maintain layer of foam on floor where the wear layer has been removed until after completion of heavy adhesive residue removal.
3. Debris and Waste:
   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.
   b. Place bagged waste in a second disposal bag during decontamination and dispose of waste as required by Section 02084 Disposal of Regulated Asbestos-Containing Material.

B. Manual Removal:

1. Make a series of parallel cuts, with a knife, 4 to 8 inches (100 to 200 mm) apart parallel to the wall, keeping cut lines wet.
2. Start at the end of the room farthest from the entrance door. This will help avoid tracking of debris from the removal operation. Pry up the corner of the first strip, separating the backing layer. As the strip is being removed, spray a constant mist of the detergent solution into the delamination nip point to minimize any airborne dust particles. When done properly, any felt remaining on the floor and on the back of the strip will be thoroughly wet. Peel the strip either by pulling upward at an angle that permits the best separation or by rolling around a core.
   a. PRECAUTION: Resilient flooring becomes slippery when wet with, amended water, removal encapsulant, or a detergent solution. Use caution to contain the solution in the immediate work area. Stand on a new sheet of plywood or non-slip surface while working on wet surfaces.
3. Debris and Waste:

a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

b. Roll the strip tightly as it is removed. Tie or tape securely and place in a disposal bag or closed impermeable container for disposal.

4. Occasionally parts of the foam inner-layer will remain stuck to the backing. This condition can sometimes be eliminated by pulling the strips loose from the opposite end. Peel the foam inner-layer from the floor while spraying the detergent solution into the delamination nip point.
5. Some resilient flooring is not readily strippable by hand. When these conditions are encountered, a sharp stiff blade scraper may be used to assist cleavage of the wear layer from felt. If this procedure is used the distance between cuts should be narrowed to 3 to 5 inches (75 to 125 mm) wide.
6. Regardless of whether stripping of the wear surface is accomplished by hand peeling alone or with the assistance of a stiff blade scraper, amended water, removal encapsulant or detergent solution must be sprayed into the delamination nip point to minimize any airborne dust particles.
7. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.
8. Place all flooring strips and felt scrapings into disposal bags immediately, while still wet. Close full bags tightly and seal securely for disposal.
9. Keep floor where wear layer has been removed continuously wet until after completion of heavy residue removal.

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3.4 STEP TWO - REMOVAL OF HEAVY RESIDUE OF ADHESIVE:

A. Remove the heavy residue of adhesive left after removal of resilient tile flooring using the following procedure. If the residual adhesive is sufficiently thin that a shot/bead blast machine or slurry removal can effectively remove the mastic, this step may be skipped and step three started.

1. Dampen Floor
   a. Dampen floor by misting with amended water, removal encapsulant, or detergent solution so that entire surface is wet. Do not allow to puddle or run off to other areas. If a removal encapsulant is used, use in strict accordance with manufacturer's instructions.
   b. Keep floor continuously damp throughout removal operation.

2. Foam or Viscous Liquid:
   a. Add additional foam dry powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

3. Adhesive Removal:
   a. Begin removal at a point farthest from the entrance to the work area. Work of this step may proceed concurrently with work of removal of tile.
   b. Remove heavy residue of adhesive backing using a rotary cutting machine. Continuously mist floor in area where machine is working with amended water, removal encapsulant or detergent solution. Wet any debris generated as necessary to keep continuously wet.

4. Disposal and Debris
   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos containing Material . Dispose of Category I non-friable waste in accordance with State and Local Regulations.

5. Wet vacuum standing water with HEPA wet/dry vacuum.

6. Mop floor with amended water, removal encapsulant, or liquid detergent solution to remove all debris and residue.

7. Continue the above steps until the adhesive is sufficiently reduced in thickness that it can be effectively removed with shot/bead blast equipment.

8. Start in the corner of the room farthest from the entrance door and moisten an area of the adhesive approximately 3 by 10 feet (1 m by 3 m) with amended water, removal encapsulant, or detergent solution. Wet scrape with a stiff-bladed wall or floor scraper removing ridges and any loose adhesives until only a thin smooth film remains. Where deposits are heavy or difficult to scrape, heat with a hot-air blower prior to scraping.
   a. Dispose of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

9. Wet vacuum standing water with HEPA wet/dry vacuum.

10. Mop floor with amended water, removal encapsulant, or liquid detergent solution to remove all debris and residue.

11. Continue the above steps until the adhesive is sufficiently reduced in thickness that it can be effectively removed with shot/bead blast equipment.

3.5 STEP TWO - Removal of Residual Backing Material:

A. Remove any residual felt or rubber backing remaining adhered to the floor after removal of the wear layer of adhered vinyl sheet flooring by using the following procedure:

1. Wetting:
   a. Thoroughly wet residual backing with amended water, removal encapsulant, or detergent solution. Wait a few minutes to allow solution to soak into felt, or;

2. Foam or Viscous Liquid:
   a. Add additional foam dry powder and wet as necessary to maintain 1 inch (25 mm) of foam during the entire removal process.

3. Backing Removal:

   a. Concrete floors: Use a rotary cutter, a stiff-bladed scraper, or a floor scraper with a replaceable blade to remove the wet backing.
      1) Re-wet the backing if the solution has not completely penetrated, if drying occurs or if dry felt is exposed during scraping. Pick up the scrapings as they are removed from the floor and place in a disposal bag or impermeable container.
   b. Wood floor: Wet residual felt as above but do not excessively soak or flood wood floors with detergent solution. Excessive water can damage wood floors to the extent that new underlayment could be required. If this occurs, the Contractor will provide new underlayment at no increase in the Contract Sum. Do not use a rotary cutter on wood floors. Use manual scraping only.

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3.6 STEP THREE - REMOVAL OF ADHESIVE RESIDUE:

A. After removal of resilient flooring and any heavy residue of adhesive, mastic, or backing material, in the previous step, remove all residue of adhesive from the floor using the following procedure:

1. Do not use solvents other than water to remove adhesive residue.
2. Allow floor to dry after completion of the wet removal procedures used in previous steps.
3. Begin removal at a point farthest from the entrance to the work area.
4. Remove adhesive residue by either shot/bead blast machine or by slurry removal at the contractor's option.

3.7 SHOT/BEAD BLAST:

A. Remove residue of adhesive from floor using a shot/bead blast machine with dust collection equipment attached to a HEPA-filtered vacuum cleaner.

B. If the previous work did not reduce the thickness of adhesive sufficiently to allow effective removal by the shot/bead blast machine, repeat the second step.

C. Remove residue at walls and other hard to reach locations with a shot/bead blast edging machine or using dampened, clean, sharp, cutting sand and a hand-held rubbing stone.

D. Continue this operation until there is no residue of adhesive on the floor.

E. After removal of all residue rinse area with clear clean water using a hand sprayer.

F. Wet vacuum standing water with HEPA wet/dry vacuum.

G. Continue with the above steps until the entire room is complete.

H. Allow floor to dry and vacuum up any remaining dust or dirt using a vacuum equipped with a HEPA filter and metal floor tool (no brush).

3.8 SLURRY REMOVAL:

A. Remove residue of adhesive from floor using slurry removal in a manner that keeps the floor in the area of the work continually wet with a slurry of sand and water.

B. Place cutting sand (enough to cover an approximate 6 foot by 6 foot (1800 mm x 1800 mm) area) into a container and add either amended water or water mixed with liquid detergent (1 ounce of liquid dishwashing detergent to 1 gallon of water (31.5 ml detergent to 4 liters water)) to dampen the sand (20 pounds (9 kg) of sand to 2 gallon (2 liters) of solution).

C. Place sand over a 6 foot by 6 foot (1800 mm x 1800 mm) area and wet remove the existing adhesive residue using a terrazzo floor machine. Keep sand under rubbing stones when operating the machine. The sand and subfloor must be continuously kept wet.

D. Replace cutting sand periodically as needed to maintain adequate cutting and cleaning of floor. Add sand periodically as required.

E. Occasionally push away cutting sand from the subfloor with a wall or floor scraper to check for complete removal.

F. Remove adhesive around the edge of the room and missed areas with dampened, clean, sharp, cutting sand and a hand-held rubbing stone.

G. Wet scrape sand into a pile using a stiff-bladed floor or wall scraper and place sand and adhesive residue in a disposal bag or other impermeable container and dispose of, as required, by Section 02084 Disposal of Regulated Asbestos-Containing Material.

H. Rinse area with clear, clean water using a hand sprayer.

I. Wet-vacuum standing water with HEPA wet/dry vacuum.

J. Continue with the above steps until the entire room is complete.

K. Allow subfloor to dry and vacuum up any remaining dirt or sand using a vacuum equipped with a HEPA filter and metal floor tool (no brush).

3.9 ADHESIVE SOLVENT:

A. **Adhesive:** Remove adhesive residue by using adhesive removal solvents. Use solvents in accordance with manufacturers' instructions. Saturate adhesive with removal solvent and allow adhesive to soften. Remove by scraping, wet sanding, or wet scrub with floor cleaning machine with abrasive pad. Provide worker protection as required by material safety data sheet (MSDS) for any material used.

1. Mop floor with removal solvent as required by manufacturer's directions as required to completely remove all residue of adhesive.

2. Clean Floor after completion of removal of ACM by wet mopping with amended water. Mop three times allowing a drying time between each mopping.

3. Encapsulate cleaned floor with one coat of an encapsulant. Use an encapsulant that has been determined not to prevent the bond of new resilient flooring. Follow manufacturer's recommendations for new floor covering installation.

4. Dispose of all rags, plastic sheet, etc. in accordance with requirements of Section 02084 "Disposal of Regulated Asbestos-Containing Material".

B. **Decontaminate Equipment:** After the completion of all work, decontaminate all equipment and machinery used for work of this section. Accomplish decontamination as required by the section on Project Decontamination.

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3.10 WORK AREA CLEARANCE:

A. After completion of all resilient flooring and adhesive removal work and prior to removal of critical barriers, decontamination units, and shut down of pressure differential and ventilation system; complete project decontamination and clearance in accordance with section 01711 "Project Decontamination."

END OF SECTION 02087

02088
Removal of Asbestos Roofing Materials

BrightFields, Inc.
Environmental Services

SECTION 02088 - REMOVAL OF ASBESTOS ROOFING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

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1.2 SUMMARY OF WORK:

A. **Work of this section includes** removal and disposal of all Asbestos-Containing built-up roofing material

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Asbestos abatement project requirements** to be completed prior to start of the work of this section are set forth in the following sections:

1. **01526** - Temporary Enclosures (for Critical Barriers and Screens)
2. **01527** - Regulated Areas
3. **01561** - Worker Protection - Repair & Maintenance
4. **01563** Decontamination Units

1.4 TRAINING

A. **Non-Intact Roofing:**

1. **Worker Training:** Workers performing removal work on non-intact roofing must have completed an 8-hour training program as required by the OSHA regulation 29 CFR 1926.1101(k) covering asbestos subjects as well as training, including hands-on training, in the work practices and engineering controls specific to roofing removal work and work practices required by 29 CFR 1926.1101(g)(8).

2. **Competent Person:** Engage a person experienced in roofing work who has completed a 40 hr. EPA/AHERA supervisor training course as required by 29 CFR 1926.1101(o)(4)(I).

B. **Intact Roofing:**

1. **Worker Training:** Workers performing removal work on intact roofing must be trained as required by the OSHA regulation 29 CFR 1926.1101(g)(11) and as set forth in the Compliance Directive CPL 2-2.63 Appendix D page D-22 to D-23.

2. **Competent Person:** Competent Persons for work on intact roofing must be trained as required by the OSHA regulation 29 CFR 1926.1101(g)(11) and as set forth in the Compliance Directive CPL 2-2.63 Appendix D page D-22 to D-23.

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

1.5 SUBMITTALS:

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

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

2. **Disposal Chute:** Provide a drawing showing disposal chute and how it is to be mounted and supported. Show the relationship of the chute to the dumpster.

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

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

a. Surfactants.

b. Encapsulants.

c. Solvents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Disposal Chute:** Provide a leak tight waste disposal chute to transfer the materials to the ground.

B. **Polyethylene Sheet:** A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mil (0.15 mm) thick clear, frosted, or black as indicated.

C. **Duct Tape:** Provide duct tape in 2 inch or 3 inch (50 or 75 mm) widths as indicated, with an adhesive which is formulated to stick aggressively to sheet polyethylene.

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

E. **Disposal Bags:** Provide 6 mil (0.15 mm) thick leak-tight polyethylene bags labeled as required by Section 02084 Disposal of Regulated Asbestos Containing Material.

F. **Fiberboard Drums:** Provide heavy duty leak tight fiberboard drums with tight sealing locking metal tops.

G. **Paper board Boxes:** Provide heavy duty corrugated paper board boxes coated with plastic or wax to retard deterioration from moisture. Provide in sizes that will easily fit in disposal bags.

H. **Unlabeled Clear Bags:** Provide clear 6 mil (0.15 mm) thick leak-tight polyethylene bags with no label.

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PART 3 - EXECUTION

3.1 GENERAL

A. **Isolate air intakes**

1. Shut down air handling units that draw in fresh air from any area within 30' of the roofing work. Seal all air intakes with 6 mil sheet plastic.

2. Provide horizontal or vertical extension to relocate the opening of air intakes outside or above the regulated area.

3. Use a 20' buffer zone to isolate the work area from openings into the building.

4. Install HEPA filters in fresh air intakes for heating and ventilating equipment

B. **Install critical barriers** over all openings into building, adjacent buildings, or equipment within 30 feet of the work. Do not cover building surfaces. Erect temporary screens of reinforced sheet plastic as required to prevent wind carrying products of work to any entries of building or occupied portions of the site.

C. **Do not sand, abrade or grind** roofing materials.

D. **Use Manual methods** which do not render roofing material Anon-intact.≅ These include the use of spud, spade, flat-blade or slicing tools, such as axes, mattocks, pry bars, spud bars, crow bars, shovels, flat-blade knives, and utility knifes, to slice, cut, strip-off, shear-under, or pry up the material.

E. **Remove roofing materials** in an intact state to the extent feasible.

F. **Non-intact Built Up Roofing:** Perform all removal work on non-intact roofing when outside temperatures are warm enough that the bitumen in the roofing is above the phase change (glass) point. Carry out all roofing removal in a manner that will minimize pulverizing, breaking or abrading of involved materials.

1. **Use Wet Methods** to remove roofing materials that are not intact, or will be rendered not intact during removal, unless wet methods are not feasible or will create safety hazards.

2. **Non-intact Roof Membrane:** Wet surface of roof with amended water. Use sufficient water to completely wet surface but not cause ponding or running of water. Cut roof membrane into sections able to fit in disposal boxes. Use rotary blade to cut roof. Do not saw. Lift sections from insulation and place in disposal boxes. Bag and dispose of as required by Section 02084 ADisposal of Regulated Asbestos-Containing Material.≅

3. **Insulation in a non-intact roof assembly:** Wet insulation with amended water sufficiently to enable it to be removed in a crumbly damp mass. Remove by scraping with roofing hoes. Do not use powered roof rippers. Dispose of insulation as a non-asbestos waste.

4. **Non-intact Vapor Barrier:** Wet surface of vapor barrier with amended water. Use sufficient water to completely wet surface but not cause ponding or running of water. Scrape vapor barrier from roof deck with roofing hoes. Do not use powered roof rippers. Use water based solvent as required to completely remove vapor barrier and as much roofing bitumen as possible from roof deck. Use a HEPA vacuum or wet sweep into sweep shovels to pick up debris. Dispose of as required by Section 02084 "Disposal of Regulated Asbestos-Containing Material".

G. **Power Roof Cutter:** When removing built-up roofs with a power roof cutter

1. **Continuously mist** the blade of the cutting machine during use unless the competent person determines that misting substantially decreases worker safety.

2. **Collect dust and debris** resulting from the cutting operation:

   a. Aggregate Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector or by HEPA vacuuming along cut line.

   b. Smooth Surface: Collect all dust resulting from the cutting operation with a HEPA dust collector, by HEPA vacuuming along cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line

3. **Immediately bag dust and debris** resulting from the cutting operation or place in covered containers.

H. **Do not drop or throw** ACM that has been removed from a roof to the ground. Either carry or pass the ACM to the ground by hand, or lower it to the ground via covered, dust-tight chute, crane or hoist.

1. **Intact ACM** remove from the roof as soon as is practical, but in any event no later than the end of the work shift.

2. **ACM that is not intact** lower to the ground as soon at is practical, but in any event no later than at the end of the work shift. While the material remains on the roof either keep it wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.

I. **Upon being lowered** transfer unwrapped material to a closed receptacle in such manner so as to preclude the dispersion of dust.

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3.2 WARNING SIGNS

A. **The warning signs** required by this section shall bear the following information.

1.

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY

2.

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

3.3 DISPOSAL

A. **Dispose** of all friable materials in accordance with Section 02084 Disposal of Regulated Asbestos Containing Material. Dispose of Category I non-friable waste in accordance with State and Local Regulations.

3.4 AIRBORNE FIBER LEVELS:

A. **Airborne Fiber Levels:** Maintain airborne fiber levels less than the AStop Action Levels≅ set forth in Section 01013 ASummary of Work - Asbestos Abatement.≅

END OF SECTION - 02088

Division 9
Finishes

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BrightFields, Inc.

09251
Gypsum Board – Asbestos Enclosures

BrightFields, Inc.
Environmental Services

SECTION 09251 - GYPSUM BOARD - ASBESTOS ENCLOSURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **Types of work include** enclosure of Asbestos-Containing Materials (ACM) by the following methods or alternate approved methods:

1. Gypsum board including screw-type metal support system
2. Gypsum board directly applied to solid (continuous) substrates
3. Gypsum board applied to wood framing and furring
4. Drywall finishing (joint tape-and-compound treatment)
5. Wood framing and furring are specified in Division 6

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1.3 DEFINITIONS:

A. "Enclosure":

1. An air-tight, impermeable, permanent barrier around asbestos-containing material to control the release of asbestos fibers into the air.
2. A space, within which asbestos abatement operations are performed, whose limits are defined by rigid or non-rigid barriers for the purpose of controlling access and limiting fiber escape.

1.4 QUALITY ASSURANCE:

A. **Fire-Resistance Rating:** Where gypsum board systems with fire-resistance ratings are indicated, provide materials and installations which are identical with those of applicable assemblies tested per ASTM E 119 by fire testing laboratories acceptable to authorities having jurisdiction.

B. **Gypsum Board Terminology Standard:** GA-505 by Gypsum Association.

1.5 SUBMITTALS:

A. **Product Data:** Submit manufacturer's product literature for each gypsum board component, including other data as may be required to show compliance with these specifications.

1.6 DELIVERY, STORAGE AND HANDLING:

A. **Deliver materials** in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. **Store materials** inside under cover and in manner to keep them dry, protected from weather, direct sunlight, surface contamination, corrosion and damage from construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

C. **Handle gypsum boards** to prevent damage to edges, ends or surfaces. Protect metal corner beads and trim from being bent or damaged.

1.7 PROJECT CONDITIONS:

A. **Environmental Requirements,** General: Comply with requirements of referenced gypsum board application standards and recommendations of gypsum board manufacturer, for environmental conditions before, during and after application of gypsum board.

B. **Cold Weather Protection:** When ambient outdoor temperatures are below 50 degrees F (10 degrees C) maintain continuous, uniform, comfortable building working temperatures of not less than 50 degrees F (10 degrees C) for a minimum period of 48 hours prior to, during and following application of gypsum board and joint treatment materials or bonding of adhesives.

C. **Ventilation:** Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

2. Use HEPA filtered fan units as described in section 01513 for ventilation if required prior to clearance of work area in accordance with Section 01711.

PART 2 - PRODUCTS

2.1 METAL SUPPORT MATERIALS:

A. Ceiling Support Materials and Systems:

2. General: Size ceiling support components to comply with ASTM C 754 unless otherwise indicated.

3. Main Runners: Steel channels with rust-inhibitive finish, hot or cold-rolled.

4. Hanger Wire: ASTM A 641, soft, Class 1 galvanized.

4. Hanger Anchorage Devices: Screws, clips, bolts, or other devices applicable to the indicated method of structural anchorage for ceiling hangers and whose suitability for use intended has been proven through standard construction practices or by certified test data. Size devices for 3 x calculated load supported except size direct pull-out concrete inserts for 5 x calculated loads.

5. Furring Members: ASTM C 645; 0.0179 inch (0.455 mm) min. thickness of base metal, hat-shaped.

   a. Where shown as "Resilient", provide manufacturer's special type designed to reduce sound transmission.

6. Furring Members: ASTM C 645; 0.0179 inch (0.455 mm) min. thickness of base metal, C-shaped studs.

7. Furring Anchorages: 16 gage galvanized wire ties, manufacturer's standard wire-type clips, bolts, nails or screws as recommended by furring manufacturer and complying with ASTM C 754.

8. Direct Suspension Systems: Manufacturer's standard zinc-coated or painted steel system of furring runners, furring tees, and accessories designed for concealed support of gypsum board ceilings; of proper type for use intended.

B. Wall/Partition Support Materials:

1. Studs: ASTM C 645; 0.0179 inch (0.455 mm) min. thickness of base metal unless otherwise indicated.

   a. Depth of Section: 3-5/8 inch (90 mm), except as otherwise indicated.

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2. Runners: Match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work.

3. Furring Members: ASTM C 645; 0.0179 inch (0.455 mm) min. thickness of base metal, hat-shaped.

   a. Where shown as "Resilient," provide manufacturer's special type designed to reduce sound transmission.

4. Fasteners for Furring Members: Type and size recommended by furring manufacturer for substrate and application indicated.

2.2 GYPSUM BOARD PRODUCTS:

A. **Gypsum Wallboard:** ASTM C 36, of types, edge configuration and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.

1. Type: Regular, unless otherwise indicated

2. Type: Foil-backed where indicated

3. Type: Type X for fire-resistant rated assemblies and where indicated

4. Edges: Tapered

5. Edges: Tapered and featured (rounded or beveled) for prefilling

6. Thickness: as indicated, or if not otherwise indicated, as required to comply with ASTM C 840 for application system and support spacing indicated

B. **Water-Resistant Gypsum Backing Board:** ASTM C 630, with tapered edges and of type and thickness indicated below; in maximum lengths available to minimize end-to-end butt joints.

1. Type: Regular, unless otherwise indicated

2. Type: Type X for fire-resistant rated assemblies and where indicated
3. Thickness: 5/8 inch (16 mm), unless otherwise indicated

4. Thickness: 2 inch (13 mm), unless otherwise indicated

5. Thickness: As indicated, or if not otherwise indicated, 5/8 inch (16 mm)

C. **Exterior Gypsum Soffit Board:** ASTM C 931, with manufacturer's standard edges, of type and thickness indicated below:

2.3 TRIM ACCESSORIES:

A. **General:** Provide manufacturer's standard trim accessories of types indicated for drywall work, formed of galvanized steel unless otherwise indicated, with either knurled and perforated or expanded flanges for nailing or stapling, and beaded for concealment of flanges in joint compound. Provide corner beads, L-type edge trim-beads, U-type edge trim-beads, special L-kerf-type edge trim-beads, and one-piece control joint beads.

B. **Semi-Finishing Type:** manufacturer's standard trim units which are not to be finished with joint compound (non-beaded).

C. **Plastic Edge Trim:** manufacturer's standard rigid or semi-rigid PVC moldings of the semi-finished type, shaped to provide resilient contact of gypsum board edges with other work; friction-fit, or pressure-sensitive adhesive mounting.

D. **Joint Compound:** on interior work provide chemical-hardening-type for bedding and filling, ready-mixed vinyl-type or vinyl-type powder type for topping.

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2.4 MISCELLANEOUS MATERIALS:

A. **General:** Provide auxiliary materials for gypsum board work of the type and grade recommended by the manufacturer of the gypsum board.

PART 3 - EXECUTION

3.1 PREPARATION FOR METAL SUPPORT SYSTEMS

A. **Ceiling Anchorages:** Before starting work of this section complete the following:

1. Section 01513 - Temporary Pressure Differential & Air Circulation System
2. Section 01563 - Decontamination Units
3. Section 01526 - Temporary Enclosures
4. Section 01560 - Worker Protection - Asbestos Abatement
5. Section 01562 - Respiratory Protection

B. **Ceiling Anchorages:** Before starting of work of this section complete the following:
1. Section 01527 - Regulated Areas
2. Section 01561 - Worker Protection - Repair & Maintenance
3. Section 01562 - Respiratory Protection

C. **Wall Anchorages:** Before starting work of this section complete the following:
1. Section 01513 - Temporary Pressure Differential & Air Circulation System
2. Section 01563 - Decontamination Units
3. Section 01526 - Temporary Enclosures
4. Section 01560 - Worker Protection - Asbestos Abatement
5. Section 01562 - Respiratory Protection

D. **Wall Anchorages:** Before starting work of this section complete the following:
1. Section 01527 - Regulated Areas
2. Section 01561 - Worker Protection - Repair & Maintenance
3. Section 01562 - Respiratory Protection

3.2 INSTALLATION OF METAL SUPPORT SYSTEMS:

A. **General:**

B. **ACM:** In disturbing ACM comply with the following:
1. Section 01046 - Cutting and Patching Asbestos-Containing Materials
2. Section 01529 - Mini Enclosures and Glovebags

C. **Metal Support Installation Standard:** Comply with ASTM C 754.

1. Do not bridge building expansion joints with support system. Frame both sides of joints with furring and other support as indicated. Provide air tight seal between partition and adjacent surfaces.

2. Nail or screw furring members to wood framing as indicated.

D. Ceiling Support Suspension Systems:

1. Secure hangers to structural support by connecting directly to structure where possible while avoiding contact with ACM; otherwise connect to inserts, clips or other anchorage devices or fasteners as indicated.

2. Space main runners 4 feet (1200 mm) o.c. and space hangers 4 feet (1200 mm) o.c. along runners, except as otherwise shown.

3. Level main runners to a tolerance of 1/4 inch (6 mm) in 12 feet (3600 mm), measured both lengthwise on each runner and transversely between parallel runners.

4. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

E. Direct-hung Metal Support System: Attach perimeter wall track or angle wherever support system meets vertical surfaces. Mechanically join support members to each other and butt-cut to fit into wall track.

5. Space furring member 16 inches (400 mm) o.c., except as otherwise indicated.

6. Install auxiliary framing at termination of drywall work, and at openings for light fixtures and similar work, as required for support of both the drywall construction and other work indicated for support thereon.

F. Wall/Partition Support Systems:

7. Install supplementary framing, blocking and bracing at terminations in the work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer.

8. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

9. Install runner tracks at floors, ceilings and structural walls and columns where gypsum board stud system abuts other work, except as otherwise indicated.

10. Extend partition stud system through acoustical ceilings and elsewhere as indicated to the structural support or substrate above the ceiling.

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11. Space studs 16 inches (400 mm) o.c., unless otherwise indicated.

6. Frame door openings to comply with detail indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for jack studs) at head and secure to jamb studs.

7. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above, unless otherwise indicated.

8. Frame openings other than door openings to comply with details indicated or, if not indicated, in same manner as required for door openings; install framing below sills of openings to match framing required above door heads.

9. Space wall furring members 16 inches (400 mm) o.c., unless otherwise indicated.

3.3 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS:

A. **Gypsum Board Application and Finishing Standards:** ASTM C 840 and GA 216.

12. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 1foot (300 mm) in alternate courses of board.

13. Install ceiling boards in the direction and manner which will minimize the number of end-butt joints, and which will avoid end joints in the central area of each ceiling. Stagger end joints at least 1 foot (300 mm).

14. Install wall/partition boards vertically or horizontally to avoid end-butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.

15. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch (1.6 mm) open space between boards. Do not force into place.

16. Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field- cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

17. Attach gypsum board to supplementary framing and blocking; Provide for additional support at openings and cutouts.

18. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories. Provide air tight seal.

19. Cover both faces of steel stud partition framing with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls which are properly braced internally.

20. Except where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.75 sq meters) in area, and may be limited to not less than 75 percent of full coverage.

21. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 2 inch (6 mm to 13 mm) space and trim edge with J-type semi-finishing edge trim. Provide air tight seal.

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B. **Floating Construction:** Where feasible, including where recommended by manufacturer, install gypsum board over wood framing, with "floating" internal corner construction.

C. **Air-Tight Seal:** Provide air-tight seal at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of beads, and seal flanking paths around or through the work, including sealing of partitions above acoustical ceilings.

22. Space fasteners in gypsum boards in accordance with referenced standards and manufacturer's recommendations, except as otherwise indicated.

3.4 METHODS OF GYPSUM BOARD APPLICATION:

A. **Single-layer Application:** Install gypsum wallboard.

B. **Double-Layer Application:** Install gypsum backing board for base layer and exposed gypsum board for face layer.

C. **Single-Layer Fastening Methods:** Apply gypsum boards to supports as follows:

23 Fasten with screws

D. **Double-Layer Fastening Methods:** Apply base layer of gypsum board and face layer to base layer as follows:

24 Fasten both base layers and face layers separately to supports with screws.

3.5 INSTALLATION OF DRYWALL TRIM ACCESSORIES:

A. **General:** Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges in accordance with manufacturer's instructions and recommendations.

25. Install corner beads at external corners of drywall work.

26. Install edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

27. Install semi-finishing trim where indicated, and where exterior gypsum board edges are not covered by applied moldings or indicated to receive trim with face flanges covered with joint compound.

28. Install edge trim where indicated on wall panels at juncture with ceilings.

29. Install control joint (beaded-type) where indicated.

3.6 INSTALLATION OF DRYWALL FINISHING:

A. **General:** Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration. Prefill open joints and rounded or beveled edges, if any, using type of compound recommended by manufacturer.

30. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.

31. Apply joint compound in 3 coats (not including prefill of openings in base), and sand or sponge between last 2 coats and after last coat.

B. **Water-Resistant Gypsum Backing Board Base for Ceramic Tile:** Comply with recommendations of gypsum backing board manufacturer for treatment of joints behind ceramic tile.

C. **Regular Gypsum Board Base for Ceramic Tile:** In areas to be tiled using organic adhesive, tape joints and apply 4 inch (100 mm) wide coat of joint compound.

D. **Partial Finishing:** Omit third coat (if specified) and sanding on concealed drywall work which is indicated for drywall finishing or which requires finishing to achieve fire-resistance rating, sound rating or to act as air or smoke barrier.

32. Refer to sections on painting, coatings and wall-coverings in Division-9 for decorative finishes to be applied to drywall work.

3.7 PROTECTION OF WORK:

A. **Provide final protection** and maintain conditions, in a manner suitable to Installer, which ensures gypsum board work being without damage or deterioration at time of substantial completion.

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3.8 CLEANING AND DECONTAMINATION:

A. **At completion** of all work clean and decontaminate the Work Area in accordance with Section 01711 - Project Decontamination

END OF SECTION - 09251

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09805
Encapsulation of Asbestos-Containing Materials

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BrightFields, Inc.
Environmental Services

SECTION 09805 - ENCAPSULATION OF ASBESTOS-CONTAINING MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK (Only Example):

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

1. *The work includes the encapsulating of asbestos-containing fireproofing located above suspended acoustic ceilings.*
2. *The work includes the encapsulating or asbestos-containing spray-on acoustic plaster in the "Main Reading Room" of the Anthophyllite Public Library.*
3. *The work includes the sealing of all scratch coat plaster from which asbestos-containing finish plaster has been removed with two (2) coats of penetrating encapsulant.*
4. *The work includes the sealing of all wood grounds, blocking, etc. that have been in contact with asbestos-containing plaster materials, and cannot be removed for structural or other reasons; with one (1) coat of penetrating encapsulant.*
5. *The work includes the sealing of pipe insulation ends at walls on the perimeter of the work area with two (2) coats of penetrating encapsulant and one (1) coat of bridging encapsulant.*

1.3 RELATED WORK SPECIFIED ELSEWHERE:

A. **Asbestos abatement project requirements** to be completed prior to start of the work of this section are set forth in the following sections:
1. 01503 Temporary Facilities - Asbestos Abatement
2. 01513 Temporary Pressure Differential & Air Circulation System
3. 01526 Temporary Enclosures
4. 01560 Worker Protection - Asbestos abatement
5. 01562 Respiratory Protection
6. 01563 Decontamination Units

B. **Asbestos abatement project requirements** to be completed at completion of the work of this section are set forth in the following sections:
1. 01711 Project Decontamination

1.4 DEFINITIONS:

A. "Encapsulant" :A material that surrounds or embeds asbestos fibers in an adhesive matrix, to prevent release of fibers.
   1. Bridging encapsulant: an encapsulant that forms a discrete layer on the surface of an in situ asbestos matrix.
   2. Penetrating encapsulant: an encapsulant that is absorbed by the in situ asbestos matrix without leaving a discrete surface layer.
   3. Removal encapsulant: a penetrating encapsulant specifically designed to minimize fiber release during removal of asbestos-containing materials rather than for in situ encapsulation.

B. "Encapsulation": Treatment of asbestos-containing materials, with an encapsulant. Application of a sealer to a substrate following completion of removal of ACM is not considered encapsulation.

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1.5 SUBMITTALS:

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

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

C. **Performance Warrantee:** Submit manufacturer's performance guarantee.

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

E. **Before Start of Work** submit the following to the Designer for review. Do not begin work until these submittals are returned with the Designer's action stamp indicating that the submittal has been= AReceived - Not Reviewed.≅
   1. Material Safety Data Sheet: Submit Material Safety Data Sheets, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for the following:
      a. Surfactants.
      b. Encapsulants.

1.6 DELIVERY AND STORAGE:

A. **Deliver materials to the job site** in original, new and unopened packages and containers bearing manufacturer's name and label, and following information:
   1. Name or title of material

2. Manufacturer's stock number and date of manufacture
3. Manufacturer's name
4. Thinning instructions
5. Application instructions

B. **Deliver materials** together with a copy of the OSHA Material Safety Data Sheet for the material.

1.7 JOB CONDITIONS:

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

1.8 QUALITY ASSURANCE:

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

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

C. **Performance Warranty:** Submit written Performance Warranty, executed by the manufacturer and co-signed by the contractor, agreeing to repair/replace spray-on work which has cracked, fallen from substrate, or otherwise deteriorated to a condition where it would not perform effectively for its intended purposes due substantially to defective materials or workmanship and not due to abuse by occupants, improper maintenance, unforeseeable ambient exposures or other causes beyond anticipated conditions and manufacturer's /contractor's control.

1. Warranty period is ___ years after date of substantial completion.

D. **Mock-up:** Prior to commencement of work, provide a sample area of encapsulation for approval, 10 feet by 10 feet (3 m by 3 m) in size. The approved mock-up shall serve as a standard for the balance of the encapsulation work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Encapsulants:** Provide penetrating or bridging type encapsulants specifically designed for application to ACM.

1. Draft Standards: Product shall be rated as acceptable for use intended when field tested in accordance with ASTM Proposed Specification P-189 "Specification for Encapsulants for Friable Asbestos Containing Building Materials".
2. Fire Safety: Use only materials that have a flame spread index of less than 25, when dry, when tested in accordance with ASTM E-84.

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2.2 MANUFACTURERS:

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

1. Penetrating Encapsulants:
2. Bridging Encapsulants:

PART 3 - EXECUTION

3.1 GENERAL:

A. **Prior to applying any encapsulating material,** ensure that application of the sealer will not cause the base material to fail and allow the sealed material to fall of its own weight or separate from the substrate. Should Contractor doubt the ability of the installation to support the sealant, request direction from the Designer before proceeding with the encapsulating work.

B. **Do Not Commence Application** of encapsulating materials until all removal work within the work area has been completed.

3.2 WORKER PROTECTION:

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

B. **In addition** to protective breathing equipment required by OSHA requirements or by this specification, use painting pre-filters on respirators to protect the dust filters when organic solvent based encapsulant are in use.

3.3 SCRATCH COAT PLASTER:

A. **Apply two (2) coats of encapsulant** to the scratch coat plaster after all ACM has been removed. Apply in strict accordance with the manufacturer's printed instructions for use of the encapsulant as an asbestos coating. Any deviations from such printed instructions must be approved by the Designer in writing prior to commencing work.

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

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

5. Apply second coat over first coat in strict conformance with manufacturer's instructions.

6. **Color the encapsulant contrasting colors** in alternate coats so that visual confirmation of complete and uniform coverage of each coat is possible. Adhere to manufacturer's instructions for coloring. At the completion of work the encapsulated surface must be a uniform third color produced by the mixture.

3.4 SEALING EXPOSED EDGES:

A. **Seal edges of ACM** exposed by removals up to an inaccessible spot such as a sleeve, wall penetration, etc. with two (2) coats of encapsulant.
   7. Prior to sealing, permit the exposed edges to dry completely to permit penetration of the sealer.

3.5 ARCHITECTURAL FINISH AND FIREPROOFING:

A. **Examine Existing Conditions:** Determine if the friable ACM to be encapsulated remains sufficiently bonded to receive the encapsulation process and if encapsulation process will effectively prevent release of asbestos fibers from the material. If the existing ACM is loose and deteriorated, the Contractor must immediately notify the Designer that removal of friable ACM must be accomplished before encapsulation.

B. **Encapsulants used on fireproofing materials** must have an Underwriters Laboratories classification and be listed in the current edition of the UL Fire Resistance Directory.

C. **Before start of work** on an architectural finish complete the work of the following:
   8 Section 01560 Worker Protection - Asbestos Abatement
   9 Section 01562 Respiratory Protection
   10 Section 01526 Temporary Enclosures
   11 Section 01563 Decontamination Units

D. **Comply with all manufacturer's instructions** for particular conditions of installation in each case. Consult with manufacturer's technical representative for conditions not covered.

E. **Encapsulate all surfaces** in full compliance with manufacturer's procedures.

F. **At completion of Encapsulation** and before removal of Work Area enclosures and Pressure Differential System, decontaminate space in accordance with requirements of section 01711.

G. **At completion of work** submit manufacturer's record of inspection of completed work and Manufacturer's Performance Guarantee executed by both manufacturer and Contractor.

3.6 DRYING ENCAPSULATED SURFACES

A. **General:** Following encapsulation work allow the HEPA filtered fan units to operate for a sufficient length of time that all encapsulated surfaces dry thoroughly. Use oscillating fans as necessary to assure circulation of air in all parts of the work area during this period. During period of drying operate Temporary Pressure Differential & Air Circulation System as and Exhaust System to as great an extent as possible.

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B. **For encapsulation projects** do not start the work of Section 01711 AProject Decontamination≅ until all encapsulated surfaces are completely dry.

END OF SECTION - 09805

Division 15
Mechanical

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15254
Repair of Insulation and Lagging

BrightFields, Inc.
Environmental Services

SECTION 15254 - REPAIR OF INSULATION AND LAGGING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

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

1.2 DESCRIPTION OF WORK:

A. **Repair of insulation** on all piping upon which asbestos-containing insulation is to remain.

B. **Repair of lagging** on boilers, breeching and equipment upon which asbestos-containing lagging and/or insulation is to remain.

C. **Extent of pipe insulation** and lagging to be repaired is shown on the drawings.

D. **Labeling** of repaired Asbestos-Containing Materials (ACM).

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1.3 SUBMITTALS

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

1. Mineral Wool Insulating Cement: Provide product data.
2. Waterproof Cement: Provide product data.
3. Nonwoven Fibrous Glass Mat: Provide product data.
4. Open Weave Glass Fiber Mat: Provide product data.
5. Plastic Jackets: Provide product data.
6. Labels: Submit samples.

PART 2 - PRODUCTS

2.1 MATERIALS

A. **Mineral Wool Insulating Cement:** Provide job-mixed insulating plaster manufactured for use on plumbing equipment.

B. **Waterproof Cement:** Provide premixed or job mixed cement manufactured for coating of thermal insulation lagging.

C. **Nonwoven Fibrous Glass Mat:** Provide felt approximately 3/32 inch (2.4 mm) thick fabricated from glass fibers.

D. **Open Weave Glass Fiber Mat:** Provide cloth with approximately 1/4 inch (6 mm) openings in weave, fabricated from glass fibers twisted or braided into strands approximately 1/128 inch (0.198 mm) in diameter.

E. **Bridging Type Encapsulant:** as specified in section 09805.

F. **Plastic Jackets:**

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

a.	H. B. Fuller Company 6107 Industrial Way Houston, Texas 77011 (800)231-9541	Speedline 25/50 Smoke-Safe PVC

PART 3 - EXECUTION

3.1 GENERAL:

A. **Before starting work** of this section complete the following:

1. Section 01513 - Temporary Pressure Differential & Air Circulation System
2. Section 01563 - Decontamination Units
3. Section 01526 - Temporary Enclosures
4. Section 01560 - Worker Protection - Asbestos Abatement
5. Section 01562 - Respiratory Protection
6. Section 01529 -Mini Enclosures and Glovebags
7. Section 01561 - Worker Protection - Repair & Maintenance

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B. **Piping**: Remove any loose material with HEPA vacuum. No existing jacket material is to be removed.

C. **Reinforced Bridging Encapsulant:** Repair with reinforced bridging encapsulant:

1. Fill holes with mineral wool insulating cement and cover damaged areas with nonwoven fibrous glass mat completely saturated with bridging type encapsulant.
2. Wrap open joints with nonwoven fibrous glass mat embedded in bridging type encapsulant.
3. Smooth mat to a wrinkle free condition. Allow to dry and coat entire surface of mat with an additional coat of bridging type encapsulant and brush to a smooth uniform appearance.

D. **Plastic Jackets:** Repair by covering with plastic jackets.

1. Install in strict accordance with manufacturers instructions

E. **Fittings:** Remove any loose material with HEPA vacuum. No existing jacket material is to be removed.

F. **Equipment Lagging:** (hot water tanks, converters, etc.) Fill damaged portion of lagging as required with mineral wool insulating cement and cover with nonwoven fibrous glass mat completely embedded in bridging type encapsulant. Coat area of repair and six inches on all sides

with bridging type encapsulant, brush out to a uniform appearance. Completely coat lagging which do not possess a canvas jacket with two coats of bridging type encapsulant.

G. **Boiler and Smoke Hoods Breeching Lagging:** Fill damaged portions of lagging, as required, with mineral wool insulating cement. Coat entire surface of lagging with 1/4" (6 mm) minimum thickness of mineral wool insulating cement reinforced with open weave glass fiber mat. Trowel surface smooth finish.

H. **Labeling:** Label all asbestos-containing piping insulation, fitting insulation lagging, etc. in unoccupied areas with a 3 inch x 5 inch (75 mm x 125 mm) stickers containing the words

1.

DANGER

CONTAINS ASBESTOS FIBERS

AVOID BREATHING DUST

CANCER AND LUNG DISEASE HAZARD

AVOID BREATHING ASBESTOS

2.

CAUTION

ASBESTOS HAZARD

DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT

F. **Alternate labels.** Apply labels minimum 2 per side or maximum of five feet (5') (1500 mm) apart on boilers, breeching and equipment and a minimum of one per section and a maximum of eight feet (8') (2400 mm) apart on pipe runs. Apply labels to both sides of pipe runs which are accessible from both sides.

1. In occupied areas, provide labels shaped like stop signs approximately 3 inches (75 mm) across with text reading:

a.

STOP
Before Doing Work In This Area
See Custodian

END OF SECTION - 15254

BrightFields, Inc.

Forms

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BrightFields, Inc.

Prevailing Wage and Payroll Report Forms

BrightFields, Inc.

The most current Prevailing Wage Rates will be submitted and apply to each specific project

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PAYROLL REPORT

NAME OF CONTRACTOR [ ] OR SUBCONTRACTOR [ ]

Delaware Department of Labor
Division of Industrial Affairs
225 Corporate Boulevard
Suite 104
Newark, DE 19702
302-451-3423

ADDRESS:

PHONE:

PROJECT AND LOCATION

WEEK ENDING DATE

CONTRACT NUMBER

DATE OF PREVAILING WAGE DETERMINATION USED ON THIS PROJECT:

NAME, ADDRESS AND SOCIAL SECURITY NUMBER OF EMPLOYEE	WORK CLASSIFICATION		DAY & DATE & HOURS WORKED EACH DAY							TOTAL HOURS & RATE OF PAY		GROSS AMOUNT EARNED	DEDUCTIONS					NET WAGES PAID	HOURLY VALUE OF FRINGES
			M	T	W	T	F	S	S	HOURS	RATE		FICA	FWT	SWT				
1.		S																	
		O																	
2.		S																	
		O																	
3.		S																	
		O																	
4.		S																	
		O																	
5.		S																	
		O																	
6.		S																	
		O																	
7.		S																	
		O																	
8.		S																	
		O																	

DATE _____

I,_____ _____
(Name of signatory party) (Title)

do hereby state:

1. That I pay or supervise the payment of persons employed by

_____ on the
(Contractor or Subcontractor)

_____:
(public project)

that during the payroll period commencing on the _____ day of

_____, 20_____ and ending on the _____ day of

_____, 20 _____ all persons employed on said project

have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of the contractor or subcontractor from the full weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in the prevailing wage regulations of the State of Delaware.

2. That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work performed.

3. That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a state apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, and that the worksite ratio of apprentices to mechanics does not exceed the ratio permitted by the prevailing wage regulations of the State of Delaware.

An employer who fails to submit sworn payroll information to the Department of Labor weekly shall be subject to fines of $1,000.00 and $5,000. for each violation.

List only those fringe benefits:

For which the employer has paid; and
Which have been used to offset the full prevailing wage rate.

(See Delaware Prevailing Wage Regulations for explanation of how hourly value of benefits is the be computed.)

HOURLY COST OF BENEFITS (List in same order shown on front of record)							
Employee							
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							

I hereby certify that the foregoing information is true and correct to the best of m knowledge and belief. I realize that making a false statement under oath is a crime in State of Delaware

_____
Signature

STATE OF _____

COUNTY OF _____

SWORN TO AND SUBSCRIBED BEFORE ME, A NOTARY PUBLIC,

THIS _____ DAY OF _____, A.D. 20_____.

_____
Notary Public

COPY UNOFFICIAL WEBSITE

STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR **BUILDING CONSTRUCTION** EFFECTIVE MARCH 15, 2010

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	36.66	35.35	46.38
BOILERMAKERS	63.07	17.85	48.83
BRICKLAYERS	43.48	43.48	43.48
CARPENTERS	47.56	47.56	37.87
CEMENT FINISHERS	43.45	43.45	19.05
ELECTRICAL LINE WORKERS	43.49	37.29	28.44
ELECTRICIANS	55.35	55.35	55.35
ELEVATOR CONSTRUCTORS	64.17	40.93	30.55
GLAZIERS	60.45	60.45	54.20
INSULATORS	48.38	48.38	48.38
IRON WORKERS	55.78	55.78	37.22
LABORERS	36.10	36.10	36.10
MILLWRIGHTS	58.65	58.65	45.21
PAINTERS	39.17	39.17	39.17
PILEDRIVERS	64.37	37.64	30.45
PLASTERERS	28.40	28.40	28.40
PLUMBERS/PIPEFITTERS/STEAMFITTERS	54.27	37.24	32.71
POWER EQUIPMENT OPERATORS	53.31	53.31	26.00
ROOFERS-COMPOSITION	22.19	21.54	18.63
ROOFERS-SHINGLE/SLATE/TILE	17.52	17.50	16.45
SHEET METAL WORKERS	61.53	61.53	61.53
SOFT FLOOR LAYERS	43.42	43.42	41.56
SPRINKLER FITTERS	49.30	49.30	49.30
TERRAZZO/MARBLE/TILE FNRS	48.95	48.95	45.45
TERRAZZO/MARBLE/TILE STRS	56.43	56.43	52.63
TRUCK DRIVERS	23.19	21.59	17.99

CERTIFIED:_____ BY:_____
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

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STATE OF DELAWARE
DEPARTMENT OF LABOR
DIVISION OF INDUSTRIAL AFFAIRS
OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR **HEAVY CONSTRUCTION** EFFECTIVE MARCH 15, 2010

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
ASBESTOS WORKERS	46.38	18.60	40.43
BOILERMAKERS	63.07	30.73	41.61
BRICKLAYERS	38.48	22.19	23.83
CARPENTERS	47.56	47.56	37.87
CEMENT FINISHERS	43.45	22.94	17.35
ELECTRICAL LINE WORKERS	27.27	26.30	25.89
ELECTRICIANS	55.35	55.35	55.35
GLAZIERS	19.54	16.96	11.48
INSULATORS	48.38	39.03	48.38
IRON WORKERS	53.00	25.54	55.78
LABORERS	36.10	36.10	36.10
MILLWRIGHTS	58.65	58.65	45.21
PAINTERS	40.67	40.67	40.67
PILEDRIVERS	64.37	37.64	29.30
PLASTERERS	18.40	15.97	10.80
PLUMBERS/PIPEFITTERS/STEAMFITTERS	66.15	21.62	17.12
POWER EQUIPMENT OPERATORS	53.31	36.54	34.48
SHEET METAL WORKERS	29.40	18.23	17.13
SPRINKLER FITTERS	31.68	11.99	9.93
TRUCK DRIVERS	26.14	18.58	17.69

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DEPARTMENT OF LABOR
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OFFICE OF LABOR LAW ENFORCEMENT
PHONE: (302) 451-3423

Mailing Address:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

Located at:
225 CORPORATE BOULEVARD
SUITE 104
NEWARK, DE 19702

PREVAILING WAGES FOR **HIGHWAY CONSTRUCTION** EFFECTIVE MARCH 15, 2010

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	43.48	43.48	14.51
CARPENTERS	40.35	47.56	37.87
CEMENT FINISHERS	31.04	26.13	23.29
ELECTRICAL LINE WORKERS	34.29	54.05	54.05
ELECTRICIANS	55.35	55.35	55.35
IRON WORKERS	42.20	22.98	25.35
LABORERS	23.81	23.89	23.73
MILLWRIGHTS	16.11	15.63	13.49
PAINTERS	51.47	51.47	51.47
PILEDRIVERS	59.23	23.75	26.95
POWER EQUIPMENT OPERATORS	33.37	27.59	27.95
SHEET METAL WORKERS	22.75	20.31	18.40
TRUCK DRIVERS	26.19	20.81	19.79

CERTIFIED:_____ BY:_____
ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

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EPA/DNREC 10-Day Notification of Demolition and Renovation

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A Site Specific EPA/DNREC 10-day Notification will be prepared, as appropriate, for each project

NOTIFICATION OF DEMOLITION OR RENOVATION				DNREC USE, ONLY
1. FACILITY INFORMATION *(Identify Owner, Removal Contractor, and Certified Professional Service Firm)*				
Owner				
Address				
City	County	State	Zip	
Contact		Telephone		
REMOVAL CONTRACTOR				
Address				
City	County	State	Zip	
Site Contact *(Supervisor on-site)*		Telephone		
CERTIFIED PROFESSIONAL SERVICE FIRM				
Address				
City	County	State	Zip	
Site Contact		Telephone		
II. TYPE OF NOTIFICATION? *("O" = "Original" — "R" = "Revised")*				
III. TYPE OF OPERATION? *("D" = "Demolition" — "R" = "Renovation")*				
IV. IS ASBESTOS PRESENT? *("Y" = "YES" — "N" = "NO")*				
V. FACILITY DESCRIPTION *(Include Building Name, number and floor, or room number)*				
Building Name				
Address #1				
Address #2				
City	County	State	Zip	
Site Location				
Building Size: Sq. Meters	Sq. Feet	Number of Floors	Age in Years	
Present Use	Prior Use			

VI. PROCEDURE, INCLUDING ANALYTICAL METHOD, IF APPROPRIATE, USED TO DETECT THE PRESENCE OF ASBESTOS MATERIAL (Note: all demolition jobs must have a Survey performed by a Certified Professional Service Firm to ensure that there are no Asbestos-Containing Materials *("ACM")* present) *(Definition:* Asbestos-Containing Materials *("ACM")*: containing ***> 1% asbestos***)

VII. APPROXIMATE AMOUNT OF *REGULATED ASBESTOS-CONTAINING MATERIAL ("RACM")* TO BE REMOVED, AND NON-FRIABLE ASBESTOS MATERIAL THAT WILL *NOT* BE REMOVED
(Specify the amount of asbestos below):

VII. APPROXIMATE AMOUNT OF REGULATED ASBESTOS-CONTAINING MATERIAL ("RACM") TO BE REMOVED, AND NON-FRIABLE ASBESTOS MATERIAL THAT WILL NOT BE REMOVED (Specify the amount of asbestos below):	RACM TO BE REMOVED	NON-FRIABLE ASBESTOS MATERIAL *NOT* TO BE REMOVED	
		CATEGORY I	CATEGORY II
PIPES: Linear Feet			
PIPES: Linear Meters			
SURFACE AREA: **Square Feet**			
SURFACE AREA: Square Meters			
Volume of RACM, off-Facility **Components: Cubic Feet**			
Volume of RACM, off-Facility Components: Cubic Meters			
VIII. SCHEDULED DATES OF ASBESTOS REMOVAL/DEMOLITION/RENOVATION?		Start	Finish
IX. SCHEDULED WORKING HOURS (SHIFT HOURS) (A.M./P.M./etc.)		Start	Finish

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NOTIFICATION OF DEMOLITION OR RENOVATION.....*(continued)*

X. DESCRIPTION OF PLANNED DEMOLITION OR RENOVATION WORK, AND METHOD(s) TO BE USED

XI. DESCRIPTION OF ENGINEERING CONTROLS AND WORK PRACTICES TO BE USED TO CONTROL EMISSIONS OF ASBESTOS AT THE DEMOLITION OR RENOVATION SITE

XII. WASTE TRANSPORTER #1

Address			
City	County	State	Zip
Contact		Telephone	

WASTE TRANSPORTER #2

Address			
City	County	State	Zip
Contact		Telephone	

XII. WASTE DISPOSAL SITE — EPA Certification Number

Address			
City	County	State	Zip
Contact		**Telephone**	

XIV. IF THE DEMOLITION WAS ORDERED BY A GOVERNMENT AGENCY, PLEASE IDENTIFY THE AGENCY BELOW:

Name		Title	
Authority			
Date of Order (MM/DD/YY)		Date Ordered to Begin (MM/DD/YY)	

XV. FOR EMERGENCY RENOVATIONS:

DATE and HOUR of Emergency: (MM/DD/YY)		(HH:MM)	

Description of SUDDEN, UNEXPECTED EVENT

Explanation of how the Event caused unsafe conditions, or a serious disruption of industrial operations

XVI. DESCRIPTION OF PROCEDURES TO BE FOLLOWED IN THE EVENT THAT UNEXPECTED ASBESTOS IS FOUND, OR THAT PREVIOUSLY NON FRIABLE ASBESTOS MATERIAL BECOMES CRUMBLED, PULVERIZED OR REDUCED TO POWDER

XVII. I CERTIFY THAT AN INDIVIDUAL, TRAINED IN THE PROVISIONS OF THIS REGULATION (40 CFR, PART 61, SUBPART M WILL BE ON-SITE DURING THE DEMOLITION OR RENOVATION, AND THAT EVIDENCE THAT THE REQUIRED TRAINING HAS BEEN ACCOMPLISHED BY THIS PERSON WILL BE AVAILABLE FOR INSPECTION DURING NORMAL BUSINESS HOURS
(Required one (1) year after promulgation).

(Signature of Owner/Operator) *(Date)*

XVIII. I CERTIFY THAT THE ABOVE INFORMATION IS CORRECT

(Signature of Owner/Operator) *(Date)*

Certificate of Abatement Worker's Acknowledgement

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BrightFields, Inc.
Environmental Services

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME: Delaware Department of Transportation DATE:

PROJECT ADDRESS:

CONTRACTOR'S NAME:

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You are trained in safe work practices and in the use of the equipment found on the job. Additional training in working with asbestos containing materials has to be completed prior to working on this project and a state of Delaware worker's license has to be issued. Your employer must also have medical surveillance program in place and have trained you in respirator use. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper used of respirators, and informed of the type of respirator to be used on this project. You must be given a copy of the written protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above referenced project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. This training must have been the equivalent in curriculum, training method and length to the EPA Model Accreditation (MAP) asbestos abatement worker training (40CFR Part 763, Subpart E, Appendix C).

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no additional cost to you. This examination must have included: health history, pulmonary function tests and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer.

Signature_____ State of Delaware Asbestos Worker License #:_____

Printed Name_____ Witness_____

BrightFields, Inc.

Credential, Inspection and Observation Reports

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BrightFields, Inc.
Environmental Services

DAILY OBSERVATION REPORT

Job Site: _____ Date: / /

Work Area: _____ Project No. 2680. .74

Client: Delaware Department of Transportation Technician's Name: _____

TIME	ACTIVITY

Signature: _____

Visitors	Company

BrightFields, Inc.
Environmental Services

Credentials Report

Project Name: _____ Page: _____ of _____

Project Number: 2680. .74 Date: _____

Site: _____ Shift: _____

Contractor: _____ Area: _____

	Name (Last, First)	IN	OUT	FT	MED	Asbestos Permit No.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

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COMMENTS

_____

_____

_____

_____

_____

BrightFields, Inc. Representative Signature: _____

Daily Project Inspection Checklist

BrightFields, Inc.
Environmental Services

Project Name: _____
Project No.: 2680. .74 Project Monitor: _____
Work Area: _____ Date: _____
Project Address: _____

Worker Protection

1. Is the proper Personal Protection Equipment (PPE) being utilized?	YES	NO	N/A	
2. Type of Respirator in use?	half-face	full-face	PAPR	supplied air
3. Is fall protection being utilized?	YES	NO	N/A	
If yes, is fall protection equipment being used properly?	YES	NO		
If yes, is fall protection equipment in good working order?	YES	NO		

Work Area / Outside Work Area

1. Are all criticals intact?	YES	NO	N/A
2. Poly wall and floors installed properly?	YES	NO	N/A
3. Containment area inspected to determine integrity?	YES	NO	N/A
4. Are view ports installed as required by state or scope of work?	YES	NO	N/A
5. Work area and surrounding areas inspected for proper demarcation of hazards?	YES	NO	N/A
6. Do connections to site water system include backflow protection?	YES	NO	N/A
7. Are electrical receptacle outlets equipped with ground fault circuit interrupters (GFI)?	YES	NO	N/A
8. Are all extension cords grounded and undamaged?	YES	NO	N/A
9. Are first aid supplies and fire extinguishers located on site?	YES	NO	N/A

Negative Pressure Equipment

Contractor must have a calibrated monometer (differential pressure recording device) for each work area. No work may start or continue unless there is a negative pressure in the work area of at least 0.02 inches of water

1. Number of units _____

2. Pressure Readings: Start of shift: _____ End of shift: _____

3. Filters inspected for proper use?		YES	NO	N/A
4. Filter Changes:	Start of shift:	YES	NO	N/A
	End of shift:	YES	NO	N/A

Daily Project Inspection Checklist

BrightFields, Inc.
Environmental Services

Project Name: _____
Project No.: 2680. .74 Project Monitor: _____
Work Area: _____ Date: _____
Project Address: _____

Decontamination Units

1. Drain filter unit operational?	YES	NO	N/A
If yes, is the drain filter in place?	YES	NO	N/A
2. Is the Decon Unit clean and free of tripping hazards?	YES	NO	N/A
3. Is the decontamination sequence being followed by all persons exiting the work area?	YES	NO	N/A

Waste Management

1. Asbestos containing waste in the work area regularly picked up and bagged?		YES	NO	N/A
2. General housekeeping practices utilized during the project?		YES	NO	N/A
3. Is waste being transported to dumpster properly?		YES	NO	N/A
4. Is the waste dumpster locked when not in use?	Start of shift:	YES	NO	N/A
	End of shift:	YES	NO	N/A

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COMMENTS

Project Monitor Signature: _____

BrightFields, Inc.

Certifications and Acceptance of Project Completion

BrightFields, Inc.
Environmental Services

Certifications and Acceptance of Project Completion

Client: **Delaware Department of Transportation** Site: _____

Project No: **2680. .74** Area: _____

Address: _____

In accordance with Section 01711 - Project Decontamination of the Project Specifications, the following certifications for completion of inspections, abatement, decontamination, encapsulation, and air sampling have been fulfilled and to document that the contractor has completed all contractual obligations.

PRE-COMMENCEMENT INSPECTION

A pre-commencement inspection has been completed and any pre-existing conditions have been identified and adequately documented.

Abatement Supervisor Certification

Signature: _____ Date: _____

Supervisor License Number: _____

BrightFields' Project Monitor Certification

Signature: _____ Date: _____

Project Monitor License Number: _____

PRE-ENCAPSULATION INSPECTION

A pre-encapsulation inspection has been completed. All gross and fine removal has been completed, waste removed from containment and the area is free of any visible debris and non-essential equipment.

Abatement Supervisor Certification

Signature: _____ Date: _____

Supervisor License Number: _____

BrightFields' Project Monitor Certification

Signature: _____ Date: _____

Project Monitor License Number: _____

In the event that encapsulation is not necessary, the BrightFields Project Monitor must initial here: _____

FINAL VISUAL/CLEARANCE INSPECTION

A final visual/clearance inspection has been completed. The area is toughly dried, if applied, the encapsulation has dried and the area is free of any visible debris and non-essential equipment. All poly floors, walls, or drop cloths have been removed and criticals are intact and sealed.

Abatement Supervisor Certification

Signature: _____ Date: _____

Supervisor License Number: _____

BrightFields' Project Monitor Certification

Signature: _____ Date: _____

Project Monitor License Number: _____

Air Clearance Sampling

Air clearance samples have been collected and have met the acceptable re-occupancy concentration.

Date of Final Aggressive Air Clearance Sampling: _____

Date of results receipt: _____

Date Contractor notified of clearance results: _____

BrightFields' Project Monitor Certification

Signature: _____ Date: _____

Project Monitor License Number: _____

FINAL TEAR-DOWN INSPECTION

Remaining criticals, polyethylene sheeting, or other structures needed for the containment have been removed and properly disposed as asbestos containing waste. All remaining equipment and supplies have been removed from the site. The area is free of any residual glue, tape or polyethylene sheeting. The area has been inspected and any areas of damage have been identified and documented.

Abatement Supervisor Certification

Signature: _____ Date: _____

Supervisor License Number: _____

BrightFields' Project Monitor Certification

Signature: _____ Date: _____

Project Monitor License Number: _____

PROJECT COMPLETION CERTIFICATION

A BrightFields Project Designer and a Building Owner Representative have completed a final visual walk through inspection of the project area and are satisfied that the contractor has completed all contractual obligations and that any discrepancies that have been documented and required corrective action have been completed.

BrightFields' Project Designer Certification

Signature: _____ Date: _____

Building Owner Representative Certification

Signature: _____ Date: _____

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