Asbestos-Containing Building Materials Abatement Project Monitoring Closeout Summary Report

Bourne High School
75 Waterhouse Road
Bourne, Massachusetts

Monitoring Dates

Bourne Public Schools

Bourne, Massachusetts

July 2017

FUSS & O'NEILL
EnviroScience, LLC

Fuss & O'Neill EnviroScience, LLC
108 Myrtle Street, Suite 502
Quincy, MA 02171

FUSS & O'NEILL
EnviroScience, LLC

October 9, 2017

Mr. Jordan Geist
Director of Business Services
Bourne Public Schools
36 Sandwich Road
Bourne, MA

RE: Asbestos-Containing Building Materials Abatement
Project Monitoring Closeout Summary Report
Bourne High School
75 Waterhouse Road, Bourne, Massachusetts
Fuss & O'Neill EnviroScience, LLC Project No. 20121141.C2E

Dear Mr. Geist:

Enclosed please find the asbestos abatement project monitoring closeout report for the project completed at Bourne High School located at 75 Waterhouse Road in Bourne, Massachusetts. Abatement occurred from July 15, 2017 to July 19, 2017. The building owner should obtain the Waste Shipment Records from the Asbestos Abatement Contractor in post-abatement closeout documents when available, but no later than 45 calendar days from when the waste was removed from the project site.

Additionally, this report is important documentation that must be placed with the Asbestos Hazard Emergency Response Act (AHERA) Management Plan that was generated for the school. A copy should be placed at the school, as well as the central location where the Management Plans are stored.

If you should have any questions regarding the contents of the enclosed report, please do not hesitate to contact me at 617-282-4675, extension 4703. Thank you for this opportunity to have served your environmental needs.

Sincerely,

Dustin A. Diedricksen
Senior Project Manager

DD/so
Enclosure

108 Myrtle Street
Suite 502
Quincy, MA
02171
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www.fando.com

Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

FUSS & O'NEILL
EnviroScience, LLC

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FUSS & O'NEILL
EnviroScience, LLC

1 Introduction

Fuss & O'Neill EnviroScience, LLC (EnviroScience) was retained by Bourne Public Schools (the "Client") to provide asbestos-containing building material abatement project monitoring services at Bourne High School located at 75 Waterhouse Road in Bourne, Massachusetts (the "Site"). Abatement was necessary due to renovation activities that would have impacted asbestos-containing building materials (ACBM). Abatement activities occurred from July 15 to July 19, 2017. The scope of service was performed in accordance with our written agreement dated May 15, 2017 and is subject to the general terms and conditions of the agreement. EnviroScience provided full-time project monitoring during abatement activities. Refer to *Appendix A* for the EnviroScience staff Commonwealth of Massachusetts Department of Labor Standards (MADLS) state certifications and United States Environmental Protection Agency (EPA) accreditations.

An Asbestos Work Plan was prepared by Dustin A. Diedricksen of EnviroScience. Please refer to *Appendix B* for a copy of the Asbestos Project Designer MADLS certification and EPA accreditation.

The Asbestos Abatement Contractor was Fiber Control, Inc. (the "Contractor") of Lowell, Massachusetts.

The Contractor filed appropriate notifications with the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) and MADLS prior to the commencement of abatement activities.

2 Scope of Work

The scope of the abatement work included the removal and disposal of the following ACBM listed for each of the following locations:

Material Type	Location	Estimated Quantity
9" x 9" Floor Tile	Classrooms 20A, 21A, 22A, 23A, 24A, 25A, 27A, (Includes all Closets, Lab Prep Rooms, & Storage Rooms)	7,810 SF
Mudded Pipe-Fitting Insulation (<5")	Classrooms 20A, 21A, 22A, 23A, 25A, 27A, (Includes all Closets, Lab Prep Rooms, & Storage Rooms)	47 EA
Mudded Pipe-Fitting Insulation (>5")	Classrooms 20A, 21A, 22A, 23A, 25A, 27A, (Includes all Closets, Lab Prep Rooms, & Storage Rooms)	

EA = Each; SF = Square Feet

3 Discussion

EnviroScience was on-site full-time during the abatement project to document work practices, to conduct visual inspections, and to collect and analyze in-progress and final clearance air samples.

For each abatement work area, the Contractor established regulated work areas by constructing a negative pressure enclosure (NPE) in accordance with procedures detailed in the project design and MassDEP Regulation 310 CMR 7.15 and MADLS Regulations 453 CMR 6.00. This included the erection of protective barriers to isolate the work areas from the rest of the building, the construction of a three-stage decontamination facility contiguous to the work area, and sufficient high-efficiency particulate air (HEPA)-filtered work area ventilation systems to create negative pressure inside the work area relative to the outside spaces.

Prior to the beginning of removal activities, a pre-commencement inspection was conducted. This was performed to document that work area preparations were performed in accordance with federal and state regulations, and the project design.

Upon commencement of abatement activities, in-progress air samples were collected for analysis using Phase Contrast Microscopy (PCM). These in-progress samples were collected at various locations such as the entrance to the worker decontamination facility, outside critical barriers, and at the HEPA-filtered work area ventilation system exhaust. These samples were collected and analyzed to monitor the air quality outside the containment during the abatement process. This was done to assess the air quality at the Site during the abatement activities. Please refer to *Appendix C* for the PCM Area Air Monitoring Worksheets.

In addition to air sampling, EnviroScience performed work area inspections during removal activities. These inspections were conducted inside each work area to assess work progress and work procedures for adherence to the Asbestos Work Plan. Inspections were also performed to ensure that critical barriers remained intact and in place during abatement activities, as appropriate.

Following abatement completion, final visual inspections were performed simultaneously by an EnviroScience representative and the Abatement Supervisor. EnviroScience performed a final visual inspection in each work area to comply with federal and state regulations, and the project design. Final visual inspections were conducted to verify that the work areas met the "no visible, suspect debris" requirement prior to critical barrier removal. Refer to *Appendix D* for copies of the Final Visual Inspection Forms.

For each abatement work area, aggressive final clearance air sampling was performed after successful completion of the final visual inspection in each work area. PCM or Transmission Electron Microscopy (TEM) final clearance air samples were collected, dependent upon the amount of ACBM removed. According to AHERA Regulations, areas over 160 SF or 260 LF of ACBM, TEM final clearance air sampling must be used. TEM final clearance air samples were collected and submitted to EMSL Analytical, Inc. of Woburn, Massachusetts (EMSL) for analysis. For work areas below the 160SF or 260 LF thresholds, PCM final clearance air sampling procedures were performed. The EnviroScience Asbestos Project Monitor analyzed PCM air samples on-site. The Asbestos Project Monitor is currently

listed on the Asbestos Analysts Registry (AAR) that is maintained by the American Industrial Hygiene Association (AIHA).

- **PCM Final Clearance Air Sampling Criteria** = each interior sample less than 0.010 fibers per cubic centimeter (fibers/cc) of air.
- **TEM Final Clearance Air Sampling Criteria** = the average of interior samples less than or equal to 70 structures per millimeter squared (≤ 70 s/mm²).

A post-teardown inspection was also performed to ensure that all ACBM/ACWM and concealed debris were removed as defined in the Asbestos Work Plan.

4 Conclusion

Work areas inspected by EnviroScience passed pre-sealant visual inspections prior to work area encapsulation by the Contractor. Following encapsulation, PCM and TEM, depending on the amount of material removed, aggressive final clearance air sampling was conducted in accordance with MADLS and EPA Asbestos Hazard Emergency Response Act (AHERA) Regulation (Title 40 CFR, Part 763 Final Rule and Notice).

All work areas sampled by EnviroScience were below the MADLS and project design re-occupancy standard of 0.010 fibers/cc for PCM or less than or equal to 70 structures/mm² for TEM clearance.

Report prepared by Environmental Technician, Regina Scott.

Reviewed by:



Dustin A. Diedricksen
Senior Project Manager

FUSS & O'NEILL
EnviroScience, LLC

Appendix A

Fuss & O'Neill EnviroScience State Certifications & EPA Accreditations

Commonwealth of Massachusetts

Department of Labor Standards

William D. McKinney, Director

Asbestos Project Monitor

PAUL ANTHONY BATEMAN

Eff. Date 01/25/17

Exp. Date 02/01/18

18

AM070532

Member of C.O.N.E.S.

BOSR BOS-RENEW



Certificate of Training

This program was presented at
Fuss & O'Neill Enviro Science in.
Manchester, CT with the prior
approval of the CTDPH.

Awarded to

PAUL BATEMAN

For successful completion of an 8 (eight) hour

Asbestos Project Monitor Refresher Course

DECEMBER 6-7, 2016

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441and meets the requirements for the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: APM/R25503 **Exam Grade: 100** **Exam Date: 12/07/2016** **Expiration Date: 12/07/2017**

Christopher J. Eident, CIH, CSP, RS ***George Williamson, Training Director***

Richard Haffey, Training Director

Commonwealth of Massachusetts
Department of Labor Standards
William D. McKinney, Director
Asbestos Project Monitor

DAVID T. MAJESKI

Eff. Date 06/24/16
Exp. Date 07/28/17
AM034009
Member of C O N E S
BOSR BOS-RENEW

17



Certificate of Training

Awarded to

DAVID MAJESKI

For successful completion of an 8 (eight) hour

Asbestos Project Monitor Refresher Course

MAY 17, 2017

This training was approved and given in accordance with Regulations for Connecticut State Agencies RCSA 20-440 - 1-9 and RCSA 20-441and meets the requirements for the EPA Revised MAP under TSCA Title II of 4/4/94

Presented by

Mystic Air Quality Consultants, Inc.

1204 North Road, Groton, CT 06340 (800) 247-7746

Certificate Number: APM/R25948 **Exam Grade: 100** **Exam Date: 05/17/2017** **Expiration Date: 05/17/2018**

Christopher J. Eident, CIH, CSP, RS

George Williamson, Training Director

Richard Haffey, Training Director

FUSS & O'NEILL
EnviroScience, LLC

Appendix B

Project Designer State Certification & EPA Accreditation

Commonwealth of Massachusetts

Department of Labor Standards

William D. McKinney, Director

Asbestos Designer

DUSTIN A. DIEDRICKSEN

Eff. Date 08/30/16

Exp. Date 09/21/17

17

AD000037

Member of C.O.N.E.S.

BOSR BOS-RENEW



This is to certify that

Dustin A. Diedricksen

has completed the requisite training, and has passed an examination for reaccreditation

Asbestos Designer Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

Course Location
Institute for Environmental Education, Inc.
16 Upton Drive Wilmington, MA 01887

June 29, 2017
Course Dates

17-0632-128-208040
Certificate Number

June 29, 2017
Examination Date

June 29, 2018
Expiration Date

Training Director

FUSS & O'NEILL
EnviroScience, LLC

Appendix C

PCM Area Air Monitoring Worksheets

FUSS & O'NEILL EnviroScience, LLC

Area Air Monitoring Worksheet For Asbestos Field Analysis

Form 7400-05
Edition October 2015
Supercedes previous editions

50 Redfield Street, Suite 100, Boston, MA 02122 (617) 282-4675

Project Name: Bourne High School
Project Number: 20121141.c2e
Project Manager: Dustin Diedricksen
Project Location: Bourne High School
Bourne, Ma 02532

Rotometer Number: 101831
Rotometer Cal Date: May 1, 2017
Microscope Number: 101767
Phase Ring aligned? Yes
HSE/NPL checked? Yes

Sampler Name: David Majeski
Analyst Name: David Majeski
Analyst Signature:
Sample Date: Jul 15, 2017

AAR# 8567
Analysis Date: Jul 15, 2017

Sample ID Number	Sample Location	Activity Code/ Comment	Sample Time		Sample Durantion Minutes	Flow Rate (LPM)			Total Volume Liters	Limit of Detect. Fib/cc	Fiber Count Fib/Flds	Fiber Density (Fibers/mm2)	Fiber Conc. (Fib/cc)
			On	Off		Pre	Post	Avg.					
001-dtm-7152017	Field Blank	2 - During	0	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
002-dtm-7152017	Field Blank	2 - During	0	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
003-dtm-7152017	Outside Containment	2 - During	7:10	10:18	185	7.3	7.3	7.300	1350.500	0.002	8	10.19108	0.00291
004-dtm-7152017	Outside Containment	2 - During	7:12	10:18	186	7.3	7.3	7.300	1357.800	0.002	10	12.73885	0.00361
005-dtm-7152017	Outside Containment	2 - During	10:15	12:41	146	7.3	7.3	7.300	1065.800	0.003	7	8.91720	0.00322
006-dtm-7152017	Outside Containment	2 - During	10:18	12:45	147	7.3	7.3	7.300	1073.100	0.003	8	10.19108	0.00366
007-dtm-7152017	Outside Containment	2 - During	12:41	14:58	137	7.3	7.3	7.300	1000.100	0.003	12	15.28662	0.00588
008-dtm-7152017	Outside Containment	2 - During	12:45	15:00	135	7.3	7.3	7.300	985.500	0.003	7	8.91720	0.00348
008-dtm-7152017-rc	Outside Containment	2 - During	12:45	15:00	135	7.3	7.3	7.300	985.500	0.003	5	6.36943	0.00249

Reference Method: NIOSH 7400 Issue 2, 8/15/94
Limit of Detection: 0.055 fibers/field
Sample Type: 25 mm 3 piece 0.8µ mixed cellulose ester PCM Air Monitor

$$\text{CONCENTRATION (Fibers/mm2)} = \frac{\text{(SAMPLE fibers/field) - (BLANK fibers/field)}}{\text{(0.00785mm2/field)}}$$

$$\text{CONCENTRATION (fibers/cc)} = \frac{\text{(SAMPLE fibers/field) - (BLANK fibers/field) x (385) mm2/filter}}{\text{(0.00785mm/field) x liters x 1000 cc/liter}}$$

IC	Inside Containment
OCB	Outside Containment Barrier
Decon	Decontamination Facility

Range	Intra Lab Sr	Intra Lab Sr
1 (5-20 fibers/100 fields)	0.46	0.51
2 (>20-50 fibers/100 fields)	0.36	0.34
3 (>50 fibers/100 fields)	0.35	0.39

Project Activity

Code	Type
1	Background
2	During
3	Clearance
4	Environmental
5	Personal
6	Other

FUSS & O'NEILL EnviroScience, LLC

Area Air Monitoring Worksheet For Asbestos Field Analysis

Form 7400-05
Edition October 2015
Supercedes previous editions

50 Redfield Street, Suite 100, Boston, MA 02122 (617) 282-4675

Project Name:	Bourne High School	Rotometer Number:	101831	Sampler Name:	David Majeski		
Project Number:	20121141.c2e	Rotometer Cal Date:	May 15, 2017	Analyst Name:	David Majeski	AAR#	8567
Project Manager:	Dustin Diedricksen	Microscope Number:	101767	Analyst Signature:			
Project Location:	Bourne High School	Phase Ring aligned?	Yes	Sample Date:	Jul 16, 2017	Analysis Date:	Jul 16, 2017
	Bourne , Ma 02532	HSE/NPL checked?	Yes				

Sample ID Number	Sample Location	Activity Code/ Comment	Sample Time		Sample Durantion Minutes	Flow Rate (LPM)			Total Volume Liters	Limit of Detect. Fib/cc	Fiber Count Fib/Flds	Fiber Density (Fibers/mm2)	Fiber Conc. (Fib/cc)
			On	Off		Pre	Post	Avg.					
001-dtm-7162017	Field Blank	2 - During	0	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
002-dtm-7162017	Field Blank	2 - During	0	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
003-dtm-7162017	Outside Containment	2 - During	7:06	9:33	147	8.3	8.3	8.300	1220.100	0.002	12	15.28662	0.00482
004-dtm-7162017	Outside Containment	2 - During	7:10	9:35	145	8.3	8.3	8.300	1203.500	0.002	10	12.73885	0.00408
005-dtm-7162017	Outside Containment	2 - During	9:33	11:45	132	8.3	8.3	8.300	1095.600	0.002	7	8.91720	0.00313
006-dtm-7162017	Outside Containment	2 - During	9:35	11:48	133	8.3	8.3	8.300	1103.900	0.002	11	14.01274	0.00489
007-dtm-7162017	Outside Containment	2 - During	11:45	14:33	168	8.3	8.3	8.300	1394.400	0.002	13	16.56051	0.00457
008-dtm-7162017	Outside Containment	2 - During	11:48	14:36	168	8.3	8.3	8.300	1394.400	0.002	9	11.46497	0.00317
008-dtm-7162017-rc	Outside Containment	2 - During	11:48	14:36	168	8.3	8.3	8.300	1394.400	0.002	11	14.01274	0.00387

Reference Method: NIOSH 7400 Issue 2, 8/15/94
Limit of Detection: 0.055 fibers/field
Sample Type: 25 mm 3 piece 0.8µ mixed cellulose ester PCM Air Monitor

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IC	Inside Containment
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Range	Intra Lab Sr	Intra Lab Sr
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Project Location: Bourne High School
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Rotometer Number: 101831
Rotometer Cal Date: May 1, 2017
Microscope Number: 101767
Phase Ring aligned? Yes
HSE/NPL checked? Yes

Sampler Name: David Majeski
Analyst Name: David Majeski
Analyst Signature:
Sample Date: Jul 18, 2017

AAR# 8567
Analysis Date: Jul 18, 2017

Sample ID Number	Sample Location	Activity Code/ Comment	Sample Time		Sample Durantion Minutes	Flow Rate (LPM)			Total Volume Liters	Limit of Detect. Fib/cc	Fiber Count Fib/Flds	Fiber Density (Fibers/mm2)	Fiber Conc. (Fib/cc)
			On	Off		Pre	Post	Avg.					
07182017-dtm-001	Field Blank	6 - Other	0	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
07182017-dtm-002	Field Blank	6 - Other	O	0	0	0	0	0.000	0.000	inf	0	<7.01	<inf
07182017-dtm-003	Inside Containment	3 - Clearance	9:32	11:12	100	12.2	12.2	12.200	1220.000	0.002	8	10.19108	0.00322
07182017-dtm-004	Inside Containment	3 - Clearance	9:32	11:13	101	12.2	12.25	12.225	1234.725	0.002	5	6.36943	0.00199
07182017-dtm-005	Inside Containment	3 - Clearance	9:33	11:13	100	12.2	12.2	12.200	1220.000	0.002	8	10.19108	0.00322
07182017-dtm-006	Inside Containment	3 - Clearance	9:33	11:14	101	12.2	12.2	12.200	1232.200	0.002	5	6.36943	0.00199
07182017-dtm-007	Inside Containment	3 - Clearance	9:34	11:14	100	12.2	12.2	12.200	1220.000	0.002	8	10.19108	0.00322
07182017-dtm-008	Inside Containment	3 - Clearance	11:23	12:54	100	12.2	12.2	12.200	1220.000	0.002	7	8.91720	0.00281
07182017-dtm-009	Inside Containment	3 - Clearance	11:24	12:54	90	14.2	14.2	14.200	1278.000	0.002	10	12.73885	0.00384
07182017-dtm-010	Inside Containment	3 - Clearance	11:25	12:55	90	14.2	14.2	14.200	1278.000	0.002	7	8.91720	0.00269
07182017-dtm-011	Inside Containment	3 - Clearance	11:25	12:55	90	14.2	14.2	14.200	1278.000	0.002	9	11.46497	0.00345
07182017-dtm-012	Inside Containment	3 - Clearance	11:26	12:56	90	14.2	14.2	14.200	1278.000	0.002	6	7.64331	0.00230
07182017-dtm-013	Inside Containment	3 - Clearance	13:13	14:43	90	14.2	14.2	14.200	1278.000	0.002	9.5	12.10191	0.00365
07182017-dtm-014	Inside Containment	3 - Clearance	13:13	14:43	90	14.2	14.2	14.200	1278.000	0.002	9	11.46497	0.00345
07182017-dtm-015	Inside Containment	3 - Clearance	13:13	14:43	90	14.2	14.2	14.200	1278.000	0.002	10	12.73885	0.00384
07182017-dtm-016	Inside Containment	3 - Clearance	13:13	14:43	90	14.2	14.2	14.200	1278.000	0.002	8	10.19108	0.00307
07182017-dtm-017	Inside Containment	3 - Clearance	13:13	14:43	90	14.2	14.2	14.200	1278.000	0.002	6	7.64331	0.00230

Reference Method: NIOSH 7400 Issue 2, 8/15/94
Limit of Detection: 0.055 fibers/field
Sample Type: 25 mm 3 piece 0.8µ mixed cellulose ester PCM Air Monitor

$$\text{CONCENTRATION (Fibers/mm2)} = \frac{\text{(SAMPLE fibers/field) - (BLANK fibers/field)}}{\text{(0.00785mm2/field)}}$$

$$\text{CONCENTRATION (fibers/cc)} = \frac{\text{(SAMPLE fibers/field) - (BLANK fibers/field) x (385) mm2/filter}}{\text{(0.00785mm/field) x liters x 1000 cc/liter}}$$

IC	Inside Containment
OCB	Outside Containment Barrier
Decon	Decontamination Facility

Range	Intra Lab Sr	Intra Lab Sr
1 (5-20 fibers/100 fields)	0.46	0.51
2 (>20-50 fibers/100 fields)	0.36	0.34
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Project Activity

Code	Type
1	Background
2	During
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5	Personal

6	Other

FUSS & O'NEILL
EnviroScience, LLC

Appendix D

Final Visual Inspection Forms

f

Date: 7/17/17 ☒ Removal ☐ Encapsulation ☐ Enclosure ☐ Repair ☐ Cleanup

PROJECT NAME:	Barre High School		PROJECT NO.:	20121141.A2E	
SITE LOCATION:	2nd Fl Hallways	BUILDING:	Barre High School	☒ PASS	
WORK AREA:	2nd Fl Classrooms → 75 Ladder Farm Road - Barre MA			☐ FAIL	
CONTRACTOR:	Filter Control Inc.				

☐ Neg Pressure Contain. ☐ Mini-Enclosure ☐ Glovebag ☐ Other (Describe Below) ☐ None

(1) 1. 9th 10th Floor Tile + Mastic	QTY:	7,700SF	2.	QTY:	
(2) 3. Molded insulation	QTY:	Ea	4.	QTY:	
5.	QTY:		6.	QTY:	
7.	QTY:		8.	QTY:	
9.	QTY:		10.	QTY:	

1.	QTY:		2.	QTY:	
3.	QTY:		4.	QTY:	

Instructions: Check surfaces that pass. **Circle surfaces that fail.** Strike through N/A.

☒ Floor	☒ Horizontal Surfaces	☒ Pipes	☒ Mechanical Equipment
☒ Duct Work	☒ Vertical Surfaces	☒ Decon Unit	☒ Contractor's Equipment
☒ Fixtures	☒ Enclosed Items	☒ Waste Load Out	☐ Other:

WORK AREA CLEARANCE:	☐ PCM	☒ TEM	☐ Visual Only	☐ None Performed

I acknowledge that I inspected this work area on this day.

EnviroScience Inspector: Paul Bakeman (PRINTED) Paul Bakeman (SIGNATURE)

I have read and understand the inspection results.

Contractor's Supervisor: Khly Sok (PRINTED) Khly Sok (SIGNATURE)

f Final Visual Inspection Form
Asbestos Abatement

Date:	☒ Removal	☐ Encapsulation	☐ Enclosure	☐ Repair	☐ Cleanup
PROJECT NAME:	Bourne High School				
BUILDING:	Bourne H.S.		Project No.:	20121141. C2E	
SITE ADDRESS:	15 Waterhouse, Bourne, MA				
WORK AREA:	Girls locker			☐ Pass ☐ Fail	
CONTRACTOR:	Fiber Control				

☐ Neg. Pressure Enclosure ☒ Mini-Enclosure ☒ Glovebag ☐ Other (Describe Below) ☐ None

Pipe fittings	QTY:	18	~10 lft.	QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	

	QTY:			QTY:	
	QTY:			QTY:	

Instructions: Check surfaces that pass. Circle surfaces that fail. Strike through N/A.

☑ Floor	☑ Horizontal Surfaces	☑ Pipes	☐ Mechanical Equipment
☑ Duct Work	☑ Vertical Surfaces	☐ Decon Unit	☑ Contractor's Equipment
☐ Fixtures	~~☐ Enclosed Items~~	~~☐ Waste Load Out~~	☐ Other:

FIELD OBSERVATIONS

AIR CLEARANCE: ☑ PCM (# of Samples= 5) ☐ TEM ☐ Visual Only

ACKNOWLEDGEMENT

I acknowledge that I inspected this work area on this day.

EnviroScience Inspector: David Mayerik (PRINTED) _____ (SIGNATURE)

I have read and understand these results.

Contractor's Supervisor: Kholy Sok (PRINTED) _____ (SIGNATURE)

f

Asbestos Abatement

Date:	☐ Removal ☐ Encapsulation ☐ Enclosure ☐ Repair ☐ Cleanup		
PROJECT NAME:	Barre High School		
BUILDING:		Project No.:	201247.C2E
SITE ADDRESS:	15 Waterhouse rd. Barre, Mt		
WORK AREA:	Boys locker room	☒ Pass ☐ Fail	
CONTRACTOR:			

☐ Neg. Pressure Enclosure ☒ Mini-Enclosure ☒ Glovebag ☐ Other (Describe Below) ☐ None

Pipe fittings (23)	QTY:	~ 10 Ft		QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	

Instructions: Check surfaces that pass. Circle surfaces that fail. Strike through N/A.

☒ Floor	☒ Horizontal Surfaces	☒ Pipes	☒ Mechanical Equipment
☒ Duct Work	☒ Vertical Surfaces	☒ Decon Unit	☒ Contractor's Equipment
☒ Fixtures	~~☐ Enclosed Items~~	~~☐ Waste Load Out~~	☐ Other:

Field Observations

AIR CLEARANCE: ☒ PCM (# of Samples= 5) ☐ TEM ☐ Visual Only

I acknowledge that I inspected this work area on this day.

EnviroScience Inspector: David Majeski _____
PRINTED SIGNATURE

I have read and understand these results.

Contractor's Supervisor: Khly Sok _____
PRINTED SIGNATURE

f Final Visual Inspection Form

Asbestos Abatement

Date:	☐ Removal ☐ Encapsulation ☐ Enclosure ☐ Repair ☐ Cleanup		
PROJECT NAME:	Bourne High School		
BUILDING:	~~Aux.~~ J	Project No.:	20121141, C2E
SITE ADDRESS:	15 Waterhouse rd. Bourne, MA		
WORK AREA:	Janitor Restroom	☒ Pass ☐ Fail	
CONTRACTOR:	Fiber Control		

☒ Neg. Pressure Enclosure ☐ Mini-Enclosure ☐ Glovebag ☐ Other (Describe Below) ☐ None

Pipe fitting (6)	QTY:	2 lf		QTY:	
VAT	QTY:	110 ft²		QTY:	
	QTY:			QTY:	
	QTY:			QTY:	
	QTY:			QTY:	

	QTY:		QTY:
	QTY:		QTY:

Instructions: Check surfaces that pass. Circle surfaces that fail. Strike through N/A.

☒ Floor	☒ Horizontal Surfaces	☒ Pipes	☒ Mechanical Equipment
☒ Duct Work	☒ Vertical Surfaces	☒ Decon Unit	☒ Contractor's Equipment
☒ Fixtures	☐ Enclosed Items	☒ Waste Load Out	☐ Other:

FIELD OBSERVATIONS:

AIR CLEARANCE: ☒ PCM (# of Samples= 5) ☐ TEM ☐ Visual Only

ACKNOWLEDGEMENT

I acknowledge that I inspected this work area on this day.

EnviroScience Inspector: David Majeski (PRINTED) _____ (SIGNATURE)

I have read and understand these results.

Contractor's Supervisor: Khly Sok (PRINTED) _____ (SIGNATURE)

FUSS & O'NEILL
EnviroScience, LLC

Appendix E

TEM Laboratory Analytical Report & Chain-of-Custody Form

EMSL Analytical, Inc.
5 Constitution Way, Unit A Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 131703132
Customer ID: ENVI54
Customer PO: 20170465.A2E
Project ID:

Attention: Dustin Diedricksen
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (617) 778-3750
Fax: (888) 838-1160
Received Date: 07/18/2017 9:16 AM
Analysis Date: 07/18/2017
Collected Date: 07/17/2017

Project: 20170465.A2E / Bourne, MA High School - 75 Waterhouse Rd, Bourne, MA

Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CFR Part 763 Appendix A to Subpart E

Sample	Location	Volume (Liters)	Area Analyzed (mm²)	Non Asb	Asbestos Type(s)	#Structures ≥0.5µ < 5µ	#Structures ≥5µ	Analytical Sensitivity (S/cc)	Asbestos Concentration (S/mm²)	Asbestos Concentration (S/cc)
7-17PB-01	Classroom	1282.50	0.0655	0	None Detected			0.0046	<15.00	<0.0046
131703132-0001										
7-17PB-02	Near Decon	1282.50	0.0655	0	None Detected			0.0046	<15.00	<0.0046
131703132-0002										
7-17PB-03	Front in Classroom	1282.50	0.0655	0	None Detected			0.0046	<15.00	<0.0046
131703132-0003										
7-17PB-04	Center Rm	1282.50	0.0655	0	None Detected			0.0046	<15.00	<0.0046
131703132-0004										
7-17PB-05	Rear	1282.50	0.0655	0	None Detected			0.0046	<15.00	<0.0046
131703132-0005										
7-17PB-06	Near Decon	1273.00			Not Analyzed					N/A
131703132-0006										
7-17PB-07	Ramp	1273.00			Not Analyzed					N/A
131703132-0007										
7-17PB-08	Hall	1273.00			Not Analyzed					N/A
131703132-0008										
7-17PB-09	OCB Front	1273.00			Not Analyzed					N/A
131703132-0009										
7-17PB-10	Lobby	1273.00			Not Analyzed					N/A
131703132-0010										
7-17PB-11	Field Blank (In)				Not Analyzed					N/A
131703132-0011										
7-17PB-12	Field Blank (Out)				Not Analyzed					N/A
131703132-0012										
7-17PB-13	Sealed Control Blank				Not Analyzed					N/A
131703132-0013										

Initial report from: 07/18/2017 17:22:51

EMSL Analytical, Inc.
5 Constitution Way, Unit A Woburn, MA 01801
Tel/Fax: (781) 933-8411 / (781) 933-8412
http://www.EMSL.com / bostonlab@emsl.com

EMSL Order: 131703132
Customer ID: ENVI54
Customer PO: 20170465.A2E
Project ID:

Attention: Dustin Diedricksen
Fuss & O'Neill EnviroScience, LLC
146 Hartford Road
Manchester, CT 06040

Phone: (617) 778-3750
Fax: (888) 838-1160
Received Date: 07/18/2017 9:16 AM
Analysis Date: 07/18/2017
Collected Date: 07/17/2017

Project: 20170465.A2E / Bourne, MA High School - 75 Waterhouse Rd, Bourne, MA

Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CFR Part 763 Appendix A to Subpart E

Sample	Location	Volume (Liters)	Area Analyzed (mm^2)	Non Asb	Asbestos Type(s)	#Structures ≥0.5μ < 5μ	#Structures ≥5μ	Analytical Sensitivity (S/cc)	Asbestos Concentration (S/mm^2)	Asbestos Concentration (S/cc)

Analyst(s)

Steve Grise (5)

Steve Grise, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. Results reported in both structures/cm3 and structures/mm2 are dependent on the volume of air sampled and measured by non-laboratory personnel are not the responsibility of EMSL and are not covered by the laboratory 's NVLAP accreditation. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request.

Samples analyzed by EMSL Analytical, Inc. Woburn, MA NVLAP Lab Code 101147-0, CT PH-0315, MA AA000188, RI AAL-107T3 and VT AL998919

Initial report from: 07/18/2017 17:22:51

FUSS & O'NEILL EnviroScience, LLC

131703132 TEM Chain of Custody Form

Form 7400-12

146 Hartford Road, Manchester, CT 06040 (860) 646-2469

Fuss & O'Neill EnviroScience EMSL Customer No. ENVI54

Project Number: 20170465.AZE (per sample bags)

Project Name: Barre, MA, High School

Project Manager: Dustin Dickerson Email: ddickerson@fando.com

Project Address: 75 Waterbury Rd Barre, MA

Scope of Work: _____

Samples Collected By: Paul Brown Date: 10/17/17 Time: _____

Samples Rec'd/Sent By: Paul Brown / _____ Date: ___/___ Time: _____

Shipped to: ☒ EMSL (State) MA ☐ Lab Drop Off _____

Method of Shipment: ☒ Fed Ex. ☐ UPS Overnight ☐ UPS Ground ☐ Other _____

Sample ID Number	Sample Location	I / O	Sample Time On	Sample Time Off	Sample Duration (Min.)	Flow Rate Pre	Flow Rate Post	Flow Rate Avg.	Total Volume (Liters)
7.[illegible] 01	Classroom -	I	9:40	11:55	135	9.5	9.5	9.5	1282.5
02	Mech/Decon	I	9:41	11:56	135	9.5	9.5	9.5	1282.5
03	Exterior Classroom	I	9:42	11:57	135	9.5	9.5	9.5	1282.5
04	Center Range	I	9:43	11:58	135	9.5	9.5	9.5	1282.5
05	Rear	I	9:44	11:59	135	9.5	9.5	9.5	1282.5
06	Main Door	O	9:50	11:04	134	9.5	9.5	9.5	1273
07	Range	O	9:51	11:05	134	9.5	9.5	9.5	1273
08	Hall	O	9:52	11:06	134	9.5	9.5	9.5	1273
09	OCB Front	O	9:53	11:07	134	9.5	9.5	9.5	1273
10	Lobby	O	9:54	11:08	134	9.5	9.5	9.5	1273
7.[illegible] 11	Field Blank (In)	I							
12	Field Blank (Out)	O							
[illegible] 13	Sealed Control Blank	---							

Analysis Method: TEM AHERA Turnaround Time: 24 hr Special Instructions: _____

Email Results To: Project Manager Listed Above. Fax Results To: Fuss & O'Neill EnviroScience Lab at 888-838-1160. **Do Not Mail Hard Copies.**

Based on the turnaround time indicated to left, analysis due to EnviroScience on or before this date: _____

RECEIVED JUL 18 2017 By LL 9:16

EMSLFx 795304077151

OrderID: 131703132

Q:\EnviroScience\Admin\FORMS\Asbestos\Project Monitoring\HQ\HQ TEM COC July 2014.docx

FUSS & O'NEILL
EnviroScience, LLC

May 15, 2017

Mr. Ed Donoghue
Director of Business Services
Bourne Public Schools
36 Sandwich Road
Bourne, MA 02532

Re: Asbestos Abatement Work Plan
Bourne High School
75 Waterhouse Road, Bourne, Massachusetts
Fuss & O'Neill EnviroScience, LLC No. 20121141.C2E

Dear Mr. Donahue:

Attached please find the Asbestos Abatement Work Plan for conducting asbestos abatement activities at the Bourne High School located at 75 Waterhouse Road in Bourne, Massachusetts.

The Asbestos Abatement Contractor is required to complete and submit an asbestos notification form (ANF-001), which constitutes notification to both the Commonwealth of Massachusetts Departments of Environmental Protection and Labor Standards, at least ten (10) working days prior to the commencement of any abatement activity.

If you should have any questions regarding this procedure, please do not hesitate to call me at (617) 282-4675, extension 4703.

Sincerely,

Dustin A. Diedricksen
Senior Project Manager

DAD/so

Attachment

50 Redfield Street
Suite 100
Boston, MA
02122
t 617.282.4675
f 617.282.8253

www.fando.com

Connecticut
Massachusetts
Rhode Island
South Carolina

FUSS & O'NEILL
EnviroScience, LLC

WORK PLAN
FOR REMOVAL AND DISPOSAL
OF ASBESTOS-CONTAINING MATERIALS
BOURNE HIGH SCHOOL
BOURNE, MASSACHUSETTS
PREPARED 5/12/17

INTRODUCTION

A. Asbestos abatement activities will include removal of asbestos-containing material(s) (ACM) identified in the second floor, A-Wing science classrooms of the Bourne High School located at 75 Waterhouse Road in Bourne, Massachusetts (the "Site") to facilitate floor tile replacement activities.

B. Abatement activities are scheduled to be conducted during summer recess 2017 (July and/or August) and will be performed by a Commonwealth of Massachusetts Department of Labor Standards (MADLS)-licensed Asbestos Abatement Contractor (the "Contractor).

C. Full-time project monitoring and in-progress Phase Contrast Microscopy (PCM) air sampling will be performed by a MADLS-certified Asbestos Project Monitor.

D. Abatement activities will occur while the building is not operational (i.e., summer vacation).

E. The Contractor shall submit an Asbestos Notification Form (ANF-001) to the following agencies prior to the start of work. Submissions may be made electronically on eDEP File. This notification is required ten (10) working days prior to the start of the abatement project. The supervisor and laboratory information submitted on the form must be accurate or a revision will be required.

1. Massachusetts Department of Environmental Protection
   Asbestos Program
   Enforcement Division
   P.O. Box 4062
   Boston, MA 02211

2. Massachusetts Department of Labor Standards
   19 Staniford Street, 2nd Floor
   Boston, MA 02114

DESCRIPTION OF WORK

A. This Work Plan addresses hazards relating to the removal of ACM and asbestos-containing waste material(s) (ACWM).

B. Asbestos abatement activities will be performed in accordance with the United States Environmental Protection Agency (EPA) National Emission Standards for Hazardous Air Pollutants (NESHAP), the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP), and MADLS regulations prior to renovation or demolition work that would otherwise disturb or impact ACM.

C. Work shall be performed by a MADLS-licensed Asbestos Abatement Contractor using MADLS-certified Asbestos Workers and Supervisor(s). Training shall be in accordance with MADLS Regulation 453 CMR 6.00.

D. Bourne Public Schools (the "Owner") shall retain the services of a third-party, industrial-hygiene firm (Fuss and O'Neill EnviroScience, LLC - the "Consultant") who shall be responsible for providing project monitoring, final visual inspection, and final clearance air sampling services. Final clearance air sampling shall be conducted using Transmission Electron Microscopy (TEM).

E. Interior asbestos abatement shall be performed (as appropriate) within a negative pressure enclosure (NPE), as established herein.

F. The following table summarizes the locations and the estimated material quantities that define the Base Bid asbestos abatement work. Note quantities provided below are order-of-magnitude estimates only.

Material Type (ACM)	Location(s)	Estimated Total Quantity	Notes
9" x 9" Floor Tile	Classrooms 20A, 21A, 22A, 23A, 24A, 25A, 27A, (Includes all Closets Lab Prep Rooms, & Storage Rooms)	7,700 SF	1, 2
Mudded Pipe-Fitting Insulation (<5")	Classrooms 20A, 21A, 22A, 23A, , 25A, 27A, (Includes all Closets Lab Prep Rooms, & Storage Rooms)	25 EA	
Mudded Pipe-Fitting Insulation (>5")	Classrooms 20A, 21A, 22A, 23A, , 25A, 27A, (Includes all Closets Lab Prep Rooms, & Storage Rooms)	10 EA	3

SF = Square Feet

Notes: 1. Contractor shall perform removal of non-asbestos-containing mastics/adhesives as necessary for proper floor tile replacement (i.e., level surface); mastic shall be disposed as ACWM

2. Floor tiles shall be removed from underneath unit ventilators, and adequate cleaning shall include behind unit-ventilator panels

3. Denotes material type associated with roof drain(s)

G. The Owner will coordinate moving, lifting, removal, and/or service disconnection of all furnishings to access and abate flooring materials. This includes, but is not limited to, the following:

1. Teacher work stations;
2. Laboratory work stations;
3. Panels underneath narrow sink counters; and
4. Plumbing/natural gas connections.

H. Concealed cement pipe supports (underneath counter top and behind panel covers) are non-ACM.

UNIT PRICES

A. Unit price is an amount incorporated in the Agreement, applicable for the duration of the Work, as a price per unit of measurement for materials or services added to, or deducted from, the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

Note that the Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor.

B. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

C. Unit price amounts are net changes in the Contract Sum for additional work and include the Contractor's and any Subcontractor's amount for overhead and profit.

D. For deleted work, the net credit to the Contract Sum shall be 10% less.

E. The following unit prices that shall be provided by the Contractor are designated for items of work on the basis of quantities estimated by the Owner. These unit prices will be used to add or deduct dollar amounts shown, depending on whether the actual amount is greater or less than the estimated amount:

Unit Price 1: Removal and disposal of vinyl asbestos floor tile
Unit of Measurement: Square Feet

Unit Price 2: Removal and disposal of pipe insulation and mudded pipe fitting insulation
Unit of Measurement: Linear Feet

Unit Price 3: Construction of small mini-containment <10 SF
Unit of Measurement: Per Containment

SUBMITTALS

A. The Contractor shall submit the following to the Consultant, in one complete package, prior to the pre-construction meeting and at least ten (10) business days before the start of the Work:

1. Submit a schedule to the Owner/Architect and the Consultant that defines a timetable for executing and completing the project, including work area preparations, removal, cleanup, decontamination, and final clearance air monitoring (if applicable).
2. Submit copies of all notifications, permits, applications, licenses and like documents required by federal, state, or local regulations obtained or submitted in proper fashion. The Contractor's supervisor and laboratory information (Fuss & O'Neill EnviroScience, LLC - AA000198) submitted on Asbestos Notification Form (ANF-001) must be accurate or a revision will be required.
3. Submit the name and address of the hauling contractor and the landfill to be used. Also, submit current, valid operating permits and certificates of insurance for the transporter and landfill.
4. Submit photographic or video documentation showing the building conditions prior to the start of work. The Contractor shall be held responsible for all damage to the building and its contents not shown on the pre-construction documentation. The Contractor shall note if this does not apply since the documentation was collected by others (i.e., General Contractor).
5. Submit a detailed, site-specific work plan including, but not limited to, decon construction, work area isolation, and removal methods.
6. Submit the training, medical, and respirator fit test records as well as a current, valid MADLS certification of each employee who may be on the Site.

7. If the Contractor's MADLS-certified Asbestos Abatement Supervisor is not conducting OSHA-required employee exposure monitoring, submit the name, address, and qualifications of the air sampling professional that the Contractor proposes to use on this project for this task. The Contractor shall note if this does not apply.
8. Submit the name, address, and qualifications of proposed laboratories intended to be utilized for Contractor personal air sampling analysis as required by this Section.
9. Submit detailed product information on all materials and equipment proposed for asbestos abatement work on this project. This includes all SDS for products and chemicals that may be used on the project.
10. Submit pertinent information regarding the qualifications of the Project Supervisor (competent person) for this project, as well as a list of past projects completed.
11. Submit a chain-of-command for the project. The chain-of-command should include the name, title, and contact number for each person listed.
12. Submit a site-specific Emergency Action Plan for the project. The Emergency Action Plan may include emergency procedures to be followed by Contractor personnel to evacuate the building, hospital name and phone number, most direct transportation route from the Site, emergency telephone numbers, etc. If this information is contained within an Emergency Action Plan prepared by the Site's General Contractor, a copy shall be submitted for review.
13. Submit a written, site-specific Respiratory Protection Program for employees undertaking the Work, including make, model, and National Institute of Occupational Safety and Health (NIOSH) approval numbers of respirators to be used at the Site. The Contractor shall note if the Respiratory Protection Program is not required at the Site and why.
14. Submit the proposed electrical safeguards to be implemented by a Commonwealth of Massachusetts-licensed electrician, including but not limited to: location of transformers, GFCI outlets, lighting, and power panels necessary to safely perform the Work, including a description of electrical hazards and a safety plan for common practices in the work area. This may also include a safety plan for temporary lighting, extension cords, and other powered equipment used in the work area (locations, daily inspections, etc.).
15. Submit the proposed worker orientation plan that, at a minimum, includes a description of asbestos hazards and abatement methodologies, a review of worker protection requirements, and the outline of safety procedures.

No work on the Site will be allowed to begin until the Owner/Architect and the Consultant approve the Pre-Construction Submittals. Any delay caused by the Contractor's refusal or inability to submit this documentation in a timely manner does not constitute a cause for change order or a time extension.

B. The Contractor shall submit the following to the Consultant during the Work:

1. Copies of training, MADLS certifications, respirator fit test records, and medical records for new employees to start work 24 hours in advance of the new employee arriving at the Site.

C. The Contractor shall submit the following to the Owner at the completion of the Work. The Owner reserves the right to retain payment(s) until all items are received in completion:

1. Original final completed copies of the WSR, signed by all transporters and the designated disposal site owner/operator.

2. Original final completed copies of weight tickets, recycling tickets, and manifests for all specified materials.
3. Contractor's logs (daily activity logs, daily sign in sheets, containment sign-in sheets), and all worker training, MADLS certifications, medical records, and respirator fit test records.
4. Copies of all OSHA personal monitoring results.

MATERIALS

A. Deliver all materials in the original packages, containers, or bundles bearing the brand name, manufacturer name, and product technical description.

B. The Contractor shall have a sufficient inventory of, or dated purchase orders for, materials necessary for the Work (e.g., protective clothing, respirators, respirator filter cartridges, polyethylene (poly) sheeting of proper size and thickness, tape, spray adhesive, air filters, etc.).

C. Damaged or deteriorating materials are not permitted for use and shall be removed from the premises. Material that becomes contaminated with asbestos shall be decontaminated or disposed as ACWM.

D. Poly sheeting (packaged in a roll to minimize the frequency of joints) shall be delivered to the Site with factory label indicating four (4) or six (6)-mil thickness.

E. Poly disposable bags shall be 6-mil with OSHA-required pre-printed labels (OSHA Title 29 CFR, Part 1926.1101(k)(8)(iii)).

F. Tape or adhesive spray shall be capable of sealing joints in adjacent poly sheeting, and shall be able to attach poly sheeting to finished or unfinished surfaces of dissimilar materials. Tape and adhesive spray shall also be capable of adhering under both dry and wet conditions (including use of amended water).

G. Surfactant (wetting agent) shall consist of fifty percent (50%) polyoxyethylene ether and 50% polyoxyethylene ester, or equivalent, and shall be mixed with water to provide a concentration of 1 ounce surfactant to 5 gallons of water, or as directed by manufacturer.

H. Removal encapsulant shall be non-flammable, factory-prepared penetrating chemical encapsulant deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

I. The Contractor shall have spray equipment capable of mixing wetting agent with water. Spray equipment shall be capable of generating sufficient pressure and volume; the hose length must reach all areas within the work area.

J. Impermeable containers shall be used to receive and retain any asbestos-containing or contaminated materials until disposal at an acceptable disposal site. The containers shall be labeled in accordance with OSHA Title 29 CFR, Part 1926.1101(k)(8)(iii) [June 1, 2015 requirements]. Containers must be airtight and watertight.

K. Labels and signs, as required by OSHA Title 29 CFR, Part 1926.1101, will be used.

L. Encapsulant (if used) shall be bridging or penetrating type which has been deemed acceptable by the Consultant. Usage shall be in accordance with manufacturer's printed technical data.

TOOLS AND EQUIPMENT

A. The Contractor shall provide all clean tools and equipment necessary for asbestos abatement activities.

B. The Contractor's air monitoring professional or Abatement Supervisor shall have air-monitoring equipment of type and quantity to monitor operations and conduct personnel exposure surveillance per OSHA requirements. The equipment shall function properly and air samples shall be calibrated with a recently calibrated (within 6 calendar months) rotometer.

C. The Contractor shall have available sufficient inventory or dated purchase orders for materials necessary for the Work, including protective clothing, respirators, respirator filter cartridges, poly sheeting of proper size and thickness, tape, spray adhesive, and air filters.

D. The Contractor shall provide (as needed) temporary electrical power panels, electrical power cables, and/or electrical power sources (e.g., generators, etc.). Any electrical-connection work affecting the building electrical power system shall be performed by a Commonwealth of Massachusetts-licensed electrician, permitted as required.

E. The Contractor shall be responsible for coordinating electrical and water services, and shall pay for these services for the duration of the project (if applicable).

F. The Contractor shall assist the Consultant by providing necessary tools and equipment (e.g., coveralls, ladders, extension cords, lighting, etc.) for the Consultant to perform project monitoring activities (e.g., final visual inspection(s), in-progress and final clearance air sampling, etc.). The Consultant reserves the right to reject such items that are deemed unsafe and/or do not function properly, and may request items be replaced with adequate replacements. The work areas must be safe to enter/occupy by the Consultant at all times.

G. The Contractor shall have available shower stalls and plumbing, including sufficient hose length and drain system, or an acceptable alternate.

H. The HEPA-filtered work area ventilation systems shall contain HEPA filter(s) and be capable of sustaining sufficient air exhaust to create a minimum negative air pressure of -0.02 inches of water column within NPE with respect to the outside area. Digital monometers shall be supplied for Class 1 work. Equipment shall be checked for proper operation by smoke tubes or differential pressure gauge before the start of each shift and at least twice during the shift. Adequate exhaust air shall be provided for a minimum of 4 air changes per hour within the NPE. No air movement system or air-filtering equipment shall discharge unfiltered air outside the work area. The Contractor will have reserve units so that system will operate continuously.

I. HEPA-Vacuum Equipment, of suitable size and capacities for the project, shall have HEPA filter(s) capable of trapping and retaining at least 99.97% of all mono-dispersed particles of 0.3 micrometers in diameter or larger.

WORKER PROTECTION

A. Workers will utilize disposable clothing and varied personal protective equipment (PPE) as appropriate for the work task, including respiratory protection as required by the selection chart established in OSHA Title 29 CFR, Part 1926.1101 and MADLS Regulation 453 CMR 6.00.

B. The Contractor shall perform personal exposure monitoring of workers as required by OSHA Title 29 CFR, Part 1926.1101. Personal air exposure monitoring, at a minimum, shall include monitoring for twenty-five percent (25%) of the on-site abatement crew, or a minimum of two (2) workers per work shift.

C. Ensure no electrical equipment is energized during decontamination work. Electrical power shall be obtained from an external power source (outside the work area), and proper ground-fault circuit interrupter (GFCI) protection shall be used. The Contractor shall be responsible for the electrical work; this work must be performed by a Commonwealth of Massachusetts-licensed electrician. Observe all OSHA lock out/tag out procedures.

WORK AREA PREPARATIONS - NEGATIVE PRESSURE ENCLOSURE

A. Where necessary, deactivate electrical power, including receptacles and light fixtures. Under no circumstances during the decontamination procedures will lighting fixtures be permitted to be operating when the spraying of amended water may contact the fixture. Provide GFCI devices, temporary power, and temporary lighting installed in compliance with the applicable electrical codes. All installations are to be made by a Commonwealth of Massachusetts-licensed electrician, permitted as required.

B. Deactivate and/or isolate heating, ventilating, and air conditioning (HVAC) systems or zones to prevent contamination and fiber dispersal to other areas of the building. During the work, vents within the work area shall be "sealed" with 2 layers of 6-mil poly sheeting completely sealed with tape and spray adhesive. If deactivation is not possible, isolation shall include a hard barrier, such as plywood or rigid foam insulation board, securely affixed to active duct opening prior to sealing as described above.

C. The Contractor shall be responsible for removing moveable objects remaining within each work area. The Contractor shall pre-clean moveable objects within the proposed work areas using high-efficiency particulate air (HEPA)-filtered vacuum equipment and wet-cleaning methods as appropriate, and remove such objects from work area to a temporary storage location.

D. After HEPA-vacuum cleaning, where wall materials are not being abated, cover fixed walls with 2 layers of 4-mil poly sheeting. Where fixed walls are not used, two layers of 6-mil poly sheeting shall be applied to a rigid framework of wood, metal, or polyvinyl chloride (PVC). Where flooring materials are not being abated, cover the floor with 2 layers of 6-mil poly sheeting. All ceilings (i.e., acoustical tile, plaster, gypsum board, concrete, etc.) shall be covered with 4-mil poly sheeting in accordance with revised MassDEP regulations (310 CMR 7.15(7)(c)(6)). Sprinkler head shall be appropriately covered (if applicable). All overlaps shall be completely sealed with tape and spray adhesive.

E. Pursuant to MassDEP Regulation 310 CMR 7.15(7)(c)(4), large openings such as open doorways, elevator doors, and passageways shall be first sealed with solid construction materials, such as plywood over studding, which shall constitute the outermost boundary of the asbestos work area. All cracks, seams and openings in such solid construction materials shall be caulked or otherwise sealed, so as to prevent the movement of asbestos fibers out of the work area.

F. Create pressure differential to obtain a minimum of 4 air changes per hour within each work area by use of acceptable HEPA-filtered work area ventilation systems (HWAVSs). It is estimated that a minimum of **4** HWAVSs capable of moving at least **2,000** cubic feet per minute (CFM), plus one back-up unit, will be required to achieve 4 air changes per hour based on the volume of the work area (10,000 SF x 9' H = 90,000 CF).

G. Pre-clean fixed objects within the work areas, using HEPA-filtered vacuum equipment and wet-cleaning methods as appropriate, and enclose with 6-mil poly sheeting sealed with duct tape.

H. Clean the proposed work areas using HEPA-filtered vacuum equipment and wet-cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment that is not equipped with HEPA filters.

I. Post asbestos warning signs in accordance with OSHA Title 29 CFR, Part 1926.1101 at all approaches to the work area. Signs shall be conspicuously posted to permit a person to read signs and take precautionary measures to avoid exposure to airborne asbestos fiber concentrations.

J. Occupied areas and/or building space not within the work areas shall be separated from asbestos abatement work areas by means of airtight barriers.

K. The Contractor and the Asbestos Project Monitor shall visually inspect barriers several times daily to assure effective seal; defects shall be repaired immediately.

DECONTAMINATION FACILITY

A. The Contractor shall establish, contiguous to the work area, a three-chamber decon consisting of (in-series) equipment room, shower room, and clean room. The only access between contaminated and uncontaminated areas shall be through this decon. If it is not feasible to erect a contiguous decon, the Contractor shall establish a remote decon in as close proximity to the work area as is feasible.

B. Access between rooms in the decon shall be through double-flap, curtained openings. The clean room, shower room, and equipment room within the decon shall be completely sealed ensuring that the sole source of airflow through this area originates from uncontaminated areas outside the work area.

C. If feasible, the Contractor shall establish, contiguous with the work area, an equipment decon consisting of 2 totally-enclosed chambers divided by a double-flapped, curtained opening. No personnel are permitted to enter or exit through this unit.

D. Construct the decon with wood or metal framing and 3/8-inch sheathing, and cover both sides with 2 layers of 6-mil poly sheeting (sealed with spray glue and taped at the joints). Caulk joints watertight at floor, walls, and ceiling.

INTERIOR ASBESTOS REMOVAL

A. The Contractor shall have a competent and qualified designated person on the project at all times to ensure establishment of proper negative pressure enclosures, and to verify that appropriate work practices (in accordance with regulatory requirements) are occurring throughout the duration of the asbestos abatement project.

B. Spray asbestos materials with amended water using airless spray equipment or apply approved removal encapsulant to reduce the release of fibers during removal operations. The Consultant shall pre-approve use of amended water or encapsulant.

C. Fill disposal containers as removal proceeds. Seal filled containers, and clean containers before removal to wash area. Wet-clean each container thoroughly, double-bag and apply proper labels before moving to holding area. Ensure that workers do not enter from uncontaminated areas into the washroom or the work area.

D. After completion of stripping work, all surfaces from which ACM have been removed shall be wet-brushed (with a nylon brush), wet-wiped, and sponged or cleaned by an equivalent method to remove all visible material. Surfaces being cleaned shall be kept wet. Note that wire brushes are prohibited from use at this Site.

E. If at any time during asbestos removal, should the Owner's on-site Project Monitor suspect contamination of areas outside the work area, they shall stop all abatement work until the Contractor takes steps to decontaminate these areas and eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until air sampling and visual inspections verify decontamination.

F. Remove and containerize all visible accumulations of ACM and/or ACWM.

G. Sealed disposal containers and all equipment used in the work area shall be included in the cleanup and shall be removed from work areas. All asbestos waste shall be placed in 6-mil poly disposal bags, outside of bags shall be cleaned and they shall be placed in a second disposal bag (double-bagged) before removal and disposal. Clean all surfaces with HEPA-vacuuming equipment before wet-cleaning all surfaces within regulated area.

H. The Consultant shall conduct a post-abatement visual inspection with the containment barriers in place. If visible accumulations of any dust or bulk ACM are observed in the work area, the Contractor shall repeat the cleaning until the area is in compliance, at the Contractor's expense. The visual inspection will detect incomplete work, damage caused by abatement activities, and inadequate cleanup of the work area.

I. All surfaces (e.g., studs, rafters, subfloor) to remain shall be sprayed with a lock-down encapsulant prior to final clearance air sampling.

INTERIOR ASBESTOS REMOVAL - FLOORING

A. The Contractor shall remove binding strips, wall bases, or other restrictive molding from doorways, walls, etc., and clean and dispose as non-ACWM. Dispose any materials that have visible flooring mastic or pieces attached to them as ACWM.

B. The Contractor shall wet the floor with amended water or detergent solution so that the entire surface is wet. Do not allow to puddle or run-off into other areas. If a detergent is used, use in strict accordance with manufacturer's instructions. Allow time for humidity and water or removal encapsulant to loosen tiles prior to removal.

C. Remove tiles using a manual or powered spade or stripping machine. Continuously mist floor in areas where active abatement is proceeding with amended water, removal encapsulant, or detergent solution. Wet any

debris generated as necessary to keep continuously wet. Keep floor continuously wet where tile has been removed and until completion of heavy adhesive residue removal.

D. Remove flooring tiles, stack, place in boxes or wrap in felt, and place in labeled poly disposal bags. At the Contractor's option, tiles may be placed directly into durable, leak-tight containers.

E. After completion of resilient flooring removal, the Contractor shall perform removal of non-asbestos-containing mastics/adhesives as necessary for proper floor tile replacement (i.e., level surface); mastic shall be disposed as ACWM. If chemical stripping agents are to be used, they shall be approved by the Owner.

F. Flooring tiles shall be removed from underneath unit ventilators as applicable. Adequate cleaning shall include behind unit ventilator panels.

CONSULTANT'S RESPONSIBILITIES

A. Air sampling will be conducted by the Consultant's Asbestos Project Monitor to determine the effectiveness of the work area controls in preventing asbestos contamination. Independently, the Contractor shall monitor air quality within the work area to comply with OSHA regulations for worker safety.

B. The Consultant's Asbestos Project Monitor will collect and analyze air samples during the following period:

1. Removal Period: The Consultant's Asbestos Project Monitor will provide continual evaluation of the building air quality during asbestos removal. They will use their best professional judgment; this will include visual observations, and interpretation of air sampling results that will be compared to the MADLS guidance level of 0.010 fibers per cubic centimeter of air (fibers/cc) and the background airborne fiber concentration (if established during the pre-abatement period).

    a. If the Consultant's Asbestos Project Monitor determines that the building air quality has become contaminated from the abatement project, he/she will immediately inform the Contractor to cease all removal operations, and implement a work stoppage cleanup procedure. The Contractor shall conduct a thorough cleanup of the building areas designated by the Consultant. No further removal work may occur until the Asbestos Project Monitor has determined (through air sample collection and analysis) that the airborne fiber concentrations are at or below the MADLS re-occupancy standard.

2. Post-Abatement Period: If required, the Consultant's Asbestos Project Monitor will conduct air sampling following the final cleanup phase of the project, once the "no visible, suspect dust or debris" criterion, as established by the Consultant's Asbestos Project Monitor, has been met and the work area has been encapsulated by the Contractor. Final clearance air samples shall be collected in accordance with the MADLS re-occupancy clearance standard.

    a. As required, the Consultant's Asbestos Project Monitor shall collect final re-occupancy clearance air samples inside the work area at the completion of abatement work. These final clearance air samples shall be analyzed in accordance with requirements of EPA Title 40 CFR, Part 763, Subpart E and MADLS Regulation 453 CMR 6.00.
    b. Analysis will include a minimum of 5 air samples inside the work area utilizing aggressive methods for analysis by TEM method with an average limit of 70 structures per square millimeter

(S/mm2) of filter surface or, as allowable, PCM using the NIOSH 7400 protocol. Final air clearance samples shall be collected as required utilizing aggressive air-sampling techniques and to obtain a minimum volume of 1,200 liters.

c. The Owner shall be responsible for payment for the initial final clearance air sampling performance, only. If the first set of samples fails to satisfy the re-occupancy criteria, the Contractor shall be responsible for payment of all costs associated with the additional final clearance air sampling and analysis.

d. The Contractor shall properly schedule abatement work and other site activities at appropriate times and locations to prevent cross-contamination and/or dust in areas where the Consultant's Asbestos Project Monitor will conduct air sampling.

CONSULTANT'S INSPECTION RESPONSIBILITIES

A. The Consultant's Asbestos Project Monitor may conduct inspections throughout the progress of the abatement project. Inspections will be conducted to document the abatement work progress, as well as the Contractor's procedures and practices.

B. The Consultant's Asbestos Project Monitor may perform the following inspections during abatement activities:

1. Pre-Commencement Inspection: Pre-commencement inspections will be performed at the time requested by the Contractor. The Consultant shall be informed 24 hours prior to the time the inspection is needed. If deficiencies are noted during the pre-commencement inspection, the Contractor shall perform the necessary adjustments to obtain compliance.
2. Work Area Inspections: Work area inspections will be conducted on a daily basis, at the discretion of the Consultant. During the work inspections, the Consultant's Asbestos Project Monitor will observe the Contractor's removal procedures, verify barrier integrity, assess project progress, and (if deficiencies are noted) inform the Contractor of specific remedial activities.

C. The Consultant's Asbestos Project Monitor shall perform the following inspections during the abatement activities:

1. Pre-Sealant Inspection: If required, or retained for this service, the Consultant's Asbestos Project Monitor will conduct a pre-sealant inspection, at a time requested by the Contractor. The Consultant shall be informed 24 hours prior the time that the inspection is needed. The pre-sealant inspection shall be conducted after completion of the initial cleaning procedures, but prior to encapsulation. The pre-sealant inspection shall verify that all ACM and residual debris have been removed from the work area. If the Consultant's Asbestos Project Monitor identifies residual dust or debris during the pre-sealant inspection, the Contractor shall re-clean to meet the "no visible, suspect dust or debris" standard.
2. Final Visual Inspection: When abatement is complete, the Consultant's Asbestos Project Monitor will conduct a final visual inspection inside each regulated work area. If residual dust or debris is identified during the final inspection, the Contractor shall re-clean to meet the "no visible suspect dust or debris" standard.

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WASTE DISPOSAL

A. ACM and/or ACWM disposal (including supplies, rags, disposable clothing, respirator filter cartridges, etc.) shall be completed in accordance with MassDEP and EPA regulations. Waste receptacles (bags, drums, etc.) shall be labeled in accordance with the most current OSHA regulations (Title 29 CFR, Parts 1910.1001 and 1926.1101) and contain the following:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST

B. Disposal site approvals shall be obtained and accepted prior to the start of asbestos removal activities.

C. A copy of the signed disposal authorization shall be provided to the Owner, Architect, Consultant, and any required federal, state, or local agencies.

D. Copies of all Waste Shipment Records (WSR) shall be provided to the Owner no later than 35 calendar days from when the waste was removed from the Site for inclusion in the project file. The Contractor shall document the specific amount of waste on each WSR, portion/location of the Site building it was generated from, and the type of waste. Upon receipt of the ACM waste, the landfill operator shall sign the WSR so the quantity of asbestos debris leaving the Site and arriving at the landfill is documented for the Owner.

E. All wash water and shower water shall be collected and filtered through a five-micron filter before discharge to a sanitary sewer with prior appropriate permitting or publicly-owned treatment works (POTW) approval. Alternately, wash and shower water can be used to moisten ACWM.

F. All ACWM shall be transported in covered sealed vans, boxes, or dumpsters which are physically isolated from the driver by an airtight barrier. All vehicles must be properly-licensed to meet Commonwealth of Massachusetts and United State Department of Transportation (DOT) requirements.

G. Any vehicles used to store or transport ACWM will either be removed from the Site at night, or securely locked and posted to prevent disturbance.

H. Any incident and/or accident that may result in spilling or exposure of ACWM outside the containment, on and off the property, and all related issues shall be the sole responsibility of the Contractor.

END OF PLAN

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