HABEEB & ASSOCIATES
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FACILITY NEEDS ASSESSMENT

ESSEX ELEMENTARY SCHOOL AND MANCHESTER ESSEX MIDDLE-HIGH SCHOOL

Manchester Essex Regional School District

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FINAL REPORT: January 27, 2023
H&A JN 2217.01

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DEDICATED TO EXCEEDING OUR CLIENTS' EXPECTATIONS

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Introduction

Manchester Essex Regional School District (MERSD), working to continually improve the facilities and educational services provided for the children of the two towns, began an examination of the Essex Elementary School and the Middle-High School in the Fall of 2022.

The Essex Elementary School was constructed in 1957, with an addition/renovation project in 1975, and serves kindergarten through grade five students of the Town of Essex. The District recently occupied the completely reconstructed Memorial Elementary School which serves the kindergarten through grade five students in the Town of Manchester. The intent of the School District is to provide a learning environment and facilities at Essex Elementary School that are comparable to Memorial Elementary School.

The Middle-High School is a new building, completed in 2009, of approximately 162,000 square feet, which was first occupied 13 years ago.

Habeeb & Associates Architects was retained to assist the District in two different areas:

1. Prepare a Master Plan for the Essex Elementary School which would include a facility condition assessment, a space needs assessment, and provide master plan options.
2. Conduct a facility condition assessment of the Middle-High School to identify and budget long term major maintenance and/or replacement costs to allow for prudent future fiscal budgeting.

Essex Elementary School Executive Summary

Due to the age of the building and the desire to provide a school that will function long term and provide a conducive learning environment, a substantial renovation project should be completed that includes the replacement of not only exposed building systems, but also concealed and buried systems. Systems such as domestic hot and cold water, heating distribution piping and components, electrical wiring and panels, all have useful life expectancies which have now been exceeded. Consequently, the result of the facility condition assessment identified and revealed an approximate inflated cost of $28.75 million to complete an upgrade of this school building. The complete, detailed assessment can be found in Chapter 4 of this report.

The Master Plan section of this report includes an assessment of the educational space adequacy of the existing building. That assessment revealed that the current number and size of the existing educational spaces are greater than those required for the current and projected student enrollment of 250 students, which may relate to the building's original design intent to serve grades K through 8. Utilizing the MSBA Elementary Space Standards revealed that a square footage of 45,000 is appropriate for an elementary school enrollment of 250 students. The current square footage of the Essex Elementary School is approximately 55,000 square feet or 10,000 square feet (18%) more than that specified by MSBA standards.

Based on the result of the facility condition assessment and the space adequacy assessment H&A has identified two Master Plan Options available for the Essex Elementary School.

- Option A – A complete renovation of the existing school building (55,000 square feet) at a projected preliminary cost of $28.75 million or $523 per square foot.

- Option B – A new elementary school building of approximately 45,000 square feet at a projected preliminary cost of $32 million or $710 per square foot.

These preliminary cost estimates are subject to considerable change as MERSD researches its options further, including a potential MSBA feasibility study, which will require a more detailed programmatic review.

The complete, detailed assessment can be found in Chapter 4 of this report. Refer to the How to Read This Assessment Section of Chapter 4 for detailed Scope definitions as they relate to the Essex Elementary School.

Based on Massachusetts General Law, 521 CMR, Rules and Regulations of the Massachusetts Architectural Access Board, work items listed in the Assessment that are addressed as individual projects may trigger the need for additional accessible renovations. Generally, all new work must meet accessibility regulations. In addition, any work with a value over $500,000, either performed alone or in combination with other projects within a three-year period will also require basic accessibility upgrades, and work exceeding 30% of the full and fair cash value of the building will require complete building renovations for accessibility. 521 CMR must be considered in any "phased" approach to the necessary work.

A highlighted **Green Category** is included in the assessment as an additional category across all Scope levels to highlight Work Items that should be done regardless of long-term plans.

Category	Scope 1 (0-2 years)	Scope 2 (3-5 years)	Scope 3 ("Grandfathered" OR 6-10 years)	Total
Building Summary				**Essex Elementary School**
1. SITE	11,044	628,017	88,400	727,461
2. BUILDING ENVELOPE	1,511,900	3,847,773	1,325,935	6,685,608
3. BUILDING INTERIORS	126,035	3,218,223	102,700	3,446,958
4. MECHANICAL	481,000	3,136,640	4,518,410	8,136,050
5. ELECTRICAL	13,000	2,134,600	0	2,147,600
SubTotal of Items that should not be deferred regardless of long-term plans	2,142,979	3,821,025	0	5,964,004
[1]Total all Items	2,142,979	12,965,253	6,035,445	21,143,677
[1]Total Inflated @ 5% Compounded Annually	2,362,634	16,547,313	9,831,104	28,741,052

[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

Middle-High School Executive Summary

The result of the Middle-High School facility condition assessment identified and revealed an approximate total expenditure to be budgeted over the life of the building of $16.9 million in today's dollars. Major areas of spending are primarily related to the mechanical, electrical, and building envelope systems, which is customary and usual to properly maintain a school building of this size and age. The Equipment Maintenance Schedule and the preventative maintenance plans that have been put in place will help extend the useful life of the equipment and there is no known evidence of issues, but the need to replace worn and outdated components is inevitable. Interior finishes such as flooring and paint will wear and become damaged through normal use and are included as future budget costs. It is only prudent to start planning now for these future expenditures and budget accordingly.

The complete, detailed assessment can be found in Chapter 4 of this report. Refer to the How to Read This Assessment Section of Chapter 4 for detailed Scope definitions as they relate to the Middle-High School.

Category	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Total
Building Summary		**Manchester Essex Regional Middle-High School**		
1. SITE	36,595	0	2,367,365	2,403,960
2. BUILDING ENVELOPE	29,250	30,420	5,463,900	5,523,570
3. BUILDING INTERIORS	496,340	1,635,920	2,575,625	4,707,885
4. MECHANICAL	196,300	13,000	3,827,200	4,036,500
5. ELECTRICAL	0	13,000	171,600	184,600
[1]Total:	758,485	1,692,340	14,405,690	16,856,515
[1]Total Inflated @ 5% Compounded Annually	968,040	2,756,644	38,222,584	41,947,268

[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

Introduction

Habeeb and Associates Architects conducted an educational adequacy assessment for Essex Elementary School to evaluate how well the facility supports the educational program that it houses. Educational Adequacy is a key component to functional equity across Manchester-Essex Schools. The findings within the Educational Adequacy Assessment can be used as a comparative indicator to identify the relative programmatic needs of Essex Elementary School.

This educational adequacy assessment evaluates how well Essex Elementary School is equipped to deliver the current instructional curriculum. The assessment questions consider the following issues while referencing MSBA (Massachusetts School Building Authority) Standards:

- Is the classroom the correct size?
- Are there adequate provisions for administration, guidance, and tutorial areas?
- Does the building include all of the spaces necessary to deliver the desired educational program?
- Are the core spaces including cafeterias, gyms, library/media centers, of sufficient size, and appropriately equipped?
- Are the desired outdoor activities available?
- Is there adequate separation of pedestrian, bus, and parent drop-off traffic to ensure the safety of the students?

There are several challenges in assessing educational adequacy. First, is that programmatic needs change far quicker than the facilities themselves. Essex Elementary was built in 1957 with an addition in 1975 and today's program needs are much different. For example, special education programs not delivered in the regular classroom are conducted in retrofitted classrooms without the proper specialty spaces required to optimally serve that student population.

The assessment looks at both the inside and the outside of the school. For the outside of the school, the assessment examines parking, traffic safety, play and athletic facilities, and signage. For the inside of the school, there are four areas that are assessed relative to each kind of space: environment, size, adjacency, and storage/fixed equipment. Information within this report is used to determine the actions required to align the existing facilities with the vision and goals of the district.

Components within the Assessment

- **Environment** – For example, is the environment conducive to teaching and learning; is there sufficient light, HVAC, and acoustical treatment?
- **Size of spaces** – For example, do the classrooms meet the district's size standard; is the cafeteria large enough to seat an appropriate percentage of the student body?
- **Adjacency of spaces** – For example, is the media center adjacent to the classrooms for easy access to information and support; is there a music space and is it near other noisy spaces?
- **Storage and fixed equipment in spaces** –Is there space in the classrooms for teacher and student materials to be stored?

Educational Adequacy Rating Scale

Good: The space provides for and supports a majority of the educational program offered. It may have minor suitability/functionality issues, but generally meets the needs of the educational program.

Fair: The space has some problems meeting the needs of the educational program and needs renovation.

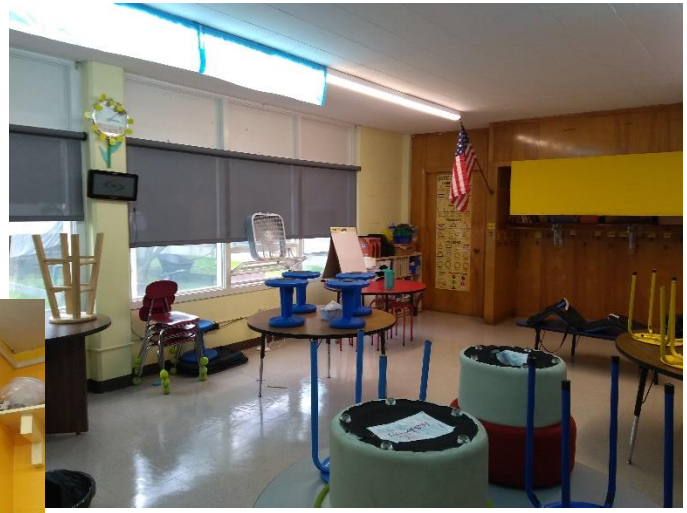
Poor: The space has numerous problems meeting the needs of the educational program.

This educational adequacy assessment determines how well the school will support the teaching curriculum. The assessment can also be used to help determine decisions regarding renovation versus replacement and the cost trade-off using facilities with significant deficiencies for long term use. Information within this report can be used to determine the actions required to align the existing facilities with the vision and goals of the district.

Educational Adequacy Rating

Fair: Overall, Essex Elementary has problems meeting the needs of the educational program based on the age and condition of the building. However, the square footage of the building meets or exceeds MSBA standards in most categories. The additional space available may be utilized to meet the programmatic needs of the Essex Elementary School community. Renovating the existing building may be a viable option when compared to the cost of replacing the existing school with a new facility but, implementing a renovation project of this magnitude would create challenges with regards to phasing of the work and/or providing temporary classroom facilities.

Typical Classroom Conditions



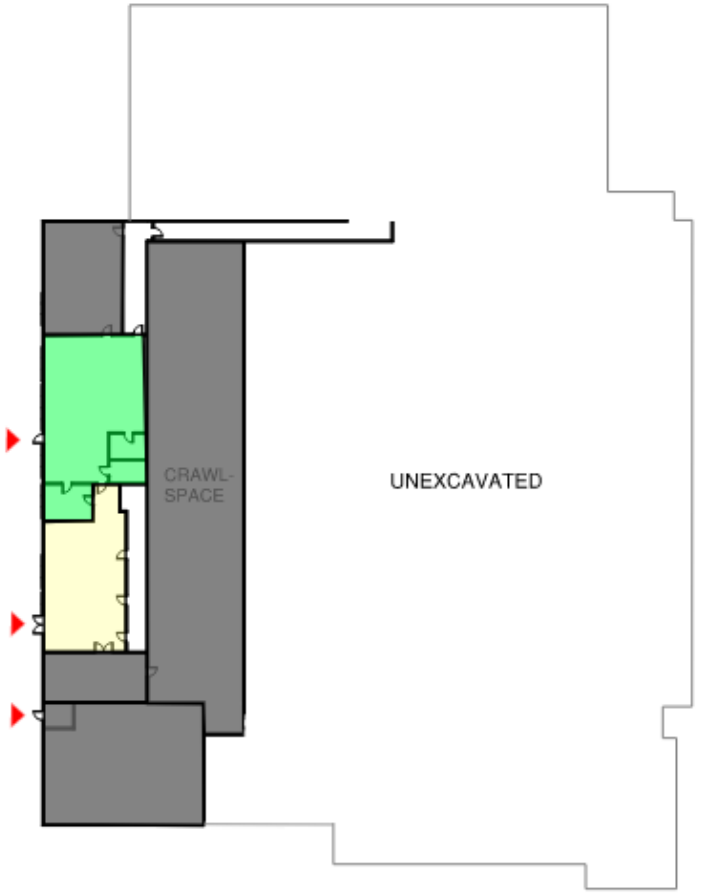
Comparison of Existing Essex Elementary School Educational Space Sizes with MSBA (Massachusetts School Building Authority) Guidelines

CORE ACADEMIC SPACES	EXISTING SPACES	MSBA SPACE STANDARDS
Kindergarten w/ toilet	Kindergarten classrooms do not have toilets. The average classroom size of 1,200 sf. which meets the MSBA minimum standard but may be impacted by the addition of dedicated toilet rooms.	1,100 sf. min. - 1,300 sf. max. 2 sinks min. required
General Classrooms - Grade 1-5	Grade 1- 5 classroom are consistent in size averaging 936 sf. which meets the MSBA minimum standards. 1 sink provided per classroom, not accessible.	900 sf. min. - 1,100 sf. max. 2 sinks min. required
Small Group Seminar - (20-30 seats)	None provided.	500 sf.
STE Room - Grade 3-6	Tech (Room 10), 936 sf. which meets minimum MSBA standards.	1,080 sf. plus 120 sf. STE storage
SPECIAL EDUCATION	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Self-Contained SPED	SPED and Swing SPED classrooms, 936 sf. which meets minimum MSBA standards.	Gr. 1-5: 900-1300 sf. equal to surrounding classrooms
Self-Contained SPED - Toilet	None provided.	60 sf.
Resource Room	None provided.	500 sf. (1/2 general classroom)
Small Group Room / Reading	936 sf. which exceeds minimum MSBA standards.	500 sf. (1/2 general classroom)
ART & MUSIC	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Art Classroom - 25 seats	Art classroom and associated storage space, 1,980 sf. which exceeds minimum MSBA standards.	Elementary Schools: 1, 000 sf
Music Classroom w/ Music Practice/Ensemble	Music room, 936 sf. which is below recommended standards.	Grades K-5 1,200 sf. w/ 75 sf. practice area
HEALTH & PHYSICAL EDUCATION	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Gymnasium	The gym itself is 5,300 sf. The gym area includes boy's and girl's locker room and storage room. Total 7,250 sf. which exceeds recommended standards.	Elementary: 6,000 sf.
MEDIA CENTER	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Media Center / Reading Room K-5	Media Center, 2,830 sf. exceeds MSBA minimum standards.	2,020 sf. w/ Reading Room

DINING & FOOD SERVICE	EXISTING SPACES	MSBA SPACE STANDARDS
Cafeteria / Dining	Cafetorium, 2,800 sf. Based on current enrollment and assuming two seatings, 1,770 sf.is provided which meets MSBA standards.	Grades K-5: 2 Seatings 15 sf./ student
Kitchen	Kitchen 1,530 sf. which meets minimum MSBA standards.	Schools at all Levels: 1,600 sf. for first 300 + 1 sf./ student additional
Staff Lunchroom	No defined space provided.	20 sf per occupant at all grade levels
MEDICAL	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Medical Suite Toilet	Toilet room provided, does not meet accessibility requirements.	All school levels 60 sf.
Nurses' Office / Waiting Room	Nurses' office and exam room, 560 sf. which exceeds MSBA minimum standards.	Gr. K-5 310 sf
ADMINISTRATION & GUIDANCE	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Includes: General Office / Waiting Room / Toilet, Teachers' Mail and Time Room, Duplicating Room, Records Room, Principal's Office w/ Conference Area, Principal's Secretary / Waiting, Assistant Principal's Office, Supervisory / Spare Office, Conference Room, Guidance Office, Guidance Storeroom, Teachers' Work Room	Main office and principal's office – 525 sf Teacher's room and guidance – 586 sf Copy room – 255 sf Storage – 1,040 sf (Modular addition) Entry foyer functions as waiting area.	Elementary Schools: 1,865 sf. total
CUSTODIAL & MAINTENANCE	**EXISTING SPACES**	**MSBA SPACE STANDARDS**
Includes: Custodian's Office, Custodian's Workshop, Custodian's Storage, Recycling Room / Trash, Receiving and General Supply, Storeroom, Network / Telecom Room	First floor, janitor's closets, 84 sf and 54 sf – 138 SF Basement Maintenance – 580 sf Boiler Room – 2,260 sf	Elementary Schools: 1,900 sf. total

ESSEX
ELEMENTARY
SCHOOL
Western Avenue
Story Street
0' 50' 100'

SITE PLAN



BASEMENT PLAN

0' 50' 100'

FIRST FLOOR PLAN

0' 50' 100'

SPACE LEGEND

- CORE ACADEMIC
- SPECIAL EDUCATION
- KINDERGARTEN
- READING
- TECH
- PHYSICAL EDUCATION
- LIBRARY / MEDIA
- ADMINISTRATIVE
- ART & MUSIC
- HEALTH
- TOILET ROOM
- DINNING & FOOD SERVICE
- STORAGE
- MECHANICAL
- CIRCULATION

Essex Elementary School	Proposed Rooms and Areas for a New 250 student Essex Elementary School			
Room Type	**Room NFA[1]**	**# of Rooms**	**Area Totals**	**MSBA Standards & Comments**
CORE ACADEMIC SPACES		**13**	**13,100**	
Pre-Kindergarten w/ toilet	1,200	0	0	1,100 SF min - 1,300 SF max
Kindergarten w/ toilet	1,200	3	3,600	1,100 SF min - 1,300 SF max
General Classrooms - Grade 1-6	950	10	9,500	900 SF min - 1,000 SF max
SPECIAL EDUCATION			**4,520**	
(List rooms of different sizes separately)				
Self-Contained SPED	950	2	1,900	900-1,300 SF equal to surrounding classrooms
Self-Contained SPED - toilet	60	2	120	
Resource Room	500	4	2,000	1/2 size Genl. Clrm.
Small Group Room / Reading	500	1	500	1/2 size Genl. Clrm.
ART & MUSIC			**2,500**	
Art Classroom - 25 seats	1,000	1	1,000	assumed schedule 2 times / week / student
Art Workroom w/ Storage & kiln	150	1	150	
Music Classroom / Large Group - 25-50 seats	1,200	1	1,200	assumed schedule 2 times / week / student
Music Practice / Ensemble	75	2	150	
HEALTH & PHYSICAL EDUCATION			**6,300**	
Gymnasium	6,000	1	6,000	6000 SF Min. size
Gym Storeroom	150	1	150	
Health Instructor's Office w/ Shower & Toilet	150	1	150	
MEDIA CENTER			**2,020**	
Media Center / Reading Room	2,020	1	2,020	
DINING & FOOD SERVICE			**5,400**	
Cafeteria / Dining	2,400	1	2,400	2 seatings - 15SF per seat
Stage	1,000	1	1,000	
Chair / Table / Equipment Storage	200	1	200	
Kitchen	1,600	1	1,600	1600 SF for first 300 + 1 SF/student Add'l
Staff Lunch Room	200	1	200	20 SF/Occupant

Essex Elementary School	Proposed Rooms and Areas for a New 250 student Essex Elementary School			
Room Type	**Room NFA[1]**	**# of Rooms**	**Area Totals**	**MSBA Standards & Comments**
MEDICAL			**410**	
Medical Suite Toilet	60	1	60	
Nurses' Office / Waiting Room	250	1	250	
Examination Room / Resting	100	1	100	
ADMINISTRATION & GUIDANCE			**2,015**	
General Office / Waiting Room / Toilet	300	1	300	
Teachers' Mail and Time Room	100	1	100	
Duplicating Room	150	1	150	
Records Room	110	1	110	
Principal's Office w/ Conference Area	375	1	375	
Principal's Secretary / Waiting	125	1	125	
Assistant Principal's Office	120	0	0	
Supervisory / Spare Office	120	1	120	
Conference Room	250	1	250	
Guidance Office	150	1	150	
Guidance Storeroom	35	1	35	
Teachers' Work Room	300	1	300	
CUSTODIAL & MAINTENANCE			**1,900**	
Custodian's Office	150	1	150	
Custodian's Workshop	375	1	375	
Custodian's Storage	375	1	375	
Recycling Room / Trash	400	1	400	
Receiving and General Supply	200	1	200	
Storeroom	200	1	200	
Network / Telecom Room	200	1	200	
OTHER			**0**	
Other *(specify)*		-		
Total Building Net Floor Area (NFA)			**38,165**	
Proposed Student Capacity / Enrollment			**250**	
Total Building Gross Floor Area (GFA)[2]			**45,000**	
Grossing factor (GFA/NFA)			**1.18**	

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Introduction

Habeeb & Associates (H&A) developed the Facility Conditions Assessment (FCA) to address the physical structure, mechanical, electrical, plumbing and fire protection systems of the Essex Elementary School and the Manchester Essex Middle-High School to better understand the maintenance and capital needs of these two buildings. This assessment identifies deficiencies including both maintenance repairs and regulatory compliance, with the associated costs. The deficiencies are prioritized into Scope 1, Scope 2, and Scope 3. Due to the differences in age and condition between the two schools the definition of each scope is unique to each building. The definition of scope is described under the Scope heading for each school and explained in more detail in the 'How to Read This Assessment' section. This assessment will allow the district to prepare a capital plan to address maintenance costs, to protect the investment in these facilities, and help guide in decision making.

The tables and photographs included in the FCA detail the recommendations and associated costs for addressing the deficiencies. Estimated costs for work to be completed in future years contain escalation factors to account for inflation. For industry-accepted HVAC life expectancy information, refer to Appendix A, ASHRAE Equipment Life Expectancy Chart.

Essex Elementary Methodology

The Essex Elementary portion of this FCA is based upon visual inspection, review of available documents, and interviews conducted on September 13, 2022, at the schools with Facilities Manager, Jason Waldron and Maintenance Supervisor, Steve Hunt. Existing deficiencies and concerns were observed, noted, and photographed by the H&A team.

For the Essex Elementary School, the H&A team was provided with construction documents for the 1975 addition prepared by W.H. Jones & Son, Architects, security floor plans, the Essex Elementary Roof Asset Management Program dated April 3, 2021 (see Appendix B), the Three Year AHERA Asbestos Re-inspection Summary Report dated January 22, 2020 (see Appendix C), the Existing Conditions Assessment dated February 1, 2002, and the Needs Assessment Study & Estimate dated May 8, 2000. Also used as a resource is the Essex Elementary and Memorial Elementary Schools Facilities Needs Assessment dated December 1, 2013 and authored by Habeeb & Associates Architects.

Given that Essex Elementary was constructed in 1957, the deficiencies observed were primarily related to the age of building, building systems and components, usage, newer code requirements, and improvements recommended to provide a safe and suitable environment for current learning practices.

Essex Elementary Scope

Work items identified by this Assessment are assigned a Scope category based on urgency, ongoing maintenance, life-cycle costs, and other concerns that compromise the teaching environment. In summary, scopes for the Essex Elementary School are categorized by the following descriptions:

Scope 1 – Immediately Necessary / Critical (0-2 years)

Scope 2 – Recommended (3-5 years)

Scope 3 – Does Not Meet Current Codes for new construction but "Grandfathered" OR Recommended (6-10 years)

Scope 1 has been assigned to Work Items that address safety concerns such as uneven floor surfaces at door thresholds which create a tripping hazard. Also included are items that present ongoing maintenance, operation, and repair issues such as windows that have reached or exceeded their life expectancy. Additionally included, are important mechanical building systems that are outdated and could present serious disruption to the school's operation should they fail. Installation of a new boiler and updating the existing boiler to function as a back-up therefore fall in this Scope. Scope 1 projects should be addressed as soon as possible.

Scope 2 addresses other less critical Work Items that are not immediately necessary, but will continue to deteriorate without maintenance, repair, or replacement. These include building envelope repairs to address the aging roof system, sealants, providing weather stripping to exterior doors, replace rotted wood siding, and repointing and removing efflorescence from brick facades. Ideally, Scope 2 projects should be completed within 3-5 years.

Scope 3 addresses Current Energy and Accessibility Code issues. Since Essex Elementary School was built in 1957, with an addition in 1975, there are many instances where current codes are not met. This includes inadequate building envelope insulation. While the brick façade is in reasonably good condition, there appears to be little or no insulation in the walls or under slab. The original 1957 windows are single glazed in deteriorating frames without thermal breaks, the 1975 windows are dual pane, though without thermally broken frames, and many windows have failed seals negating their insulation value. Additionally, the toilet facilities are very outdated, inefficient, and not up to current codes. Some changes have been made to address the Massachusetts Architectural Access Board requirements, though many non-compliant conditions, which are grandfathered, are still present. Also, the kindergarten classrooms do not have their own toilets which is an MSBA standard.

An additional highlighted **Green Category** is included on the assessment as an additional category across all Scope levels to highlight Work Items that should be done regardless of long-term plans.

Essex Elementary Summary

The Summary table categorizes the recommended capital improvements at the Essex Elementary School. This assessment details the significant capital investment needed for the school because of the age of the building systems, inadequacy of mechanical systems, deferred maintenance, inadequacy of building envelope to meet energy performance ratings, and building codes. This includes elements based on interviews, observations, and review of available drawings.

In summary, the Essex Elementary Assessment indicates in current dollars that a total of over $21 million is needed to address the school's deficiencies. Of this total, over $2 million is considered Scope 1 needs, approximately $13 million is considered Scope 2 needs, and approximately $6 million for Scope 3 needs. When reviewing the phased cost of the scope items deferred to six and ten years out, a total of nearly $29 million is needed to address the school's deficiencies.

Category	Scope 1 (0-2 years)	Scope 2 (3-5 years)	Scope 3 ("Grandfathered" OR 6-10 years)	Total
Building Summary				**Essex Elementary School**
1. SITE	11,044	628,017	88,400	727,461
2. BUILDING ENVELOPE	1,511,900	3,847,773	1,325,935	6,685,608
3. BUILDING INTERIORS	126,035	3,218,223	102,700	3,446,958
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SubTotal of Items that should not be deferred regardless of long-term plans	2,142,979	3,821,025	0	5,964,004
[1]Total all Items	2,142,979	12,965,253	6,035,445	21,143,677
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[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

Manchester Essex Regional Middle-High School Methodology

The Manchester Essex Regional Middle-High School portion of this FCA is based upon visual inspection, review of available documents, and interviews conducted on September 13, 2022, at the schools with Facilities Manager, Jason Waldron and Maintenance Supervisor, Steve Hunt. Existing deficiencies and concerns were observed, noted, and photographed by the H&A team.

For this building the H&A team was provided with copies of the construction documents prepared by the Mount Vernon Group dated March 14, 2007. The deficiencies observed were related to present and long-term maintenance items and the associated recommendations necessary to maintain the current excellent learning environment at the Middle-High School.

Manchester Essex Regional Middle-High School Scope

Work items identified by this Assessment are assigned a Scope category based on urgency, ongoing maintenance, life-cycle costs, and other concerns that could compromise the current excellent teaching environment at the Middle-High School if not addressed. In summary, scopes are categorized by the following descriptions:

Scope 1 – Necessary / Critical (1-5 years)

Scope 2 – Recommended (6-10 years)

Scope 3 – Recommended (10+ years)

Scope 1 has been assigned to Work Items that address several concerns. One concern is taking on maintenance issues that will ultimately cost the school more money if left unaddressed, such as providing a water filtration system to mitigate the harmful and corrosive minerals found in the town supplied water. This will help extend the usable life cycle of plumbing fixtures and other mechanical components. Another concern is safety and aesthetics as exemplified in the recommendation to replace the worn Auditorium carpet. Additionally, a study is recommended in this scope to determine feasibility and cost to provide additional areas of air conditioning to support summer programs and help mitigate anticipated hot weather extremes. Currently, the cafeteria and classrooms do not have cooling capabilities. Adding air conditioning in limited areas may be relatively easy to achieve.

Scope 2 Work Items are less critical, and some reflect the need to replace items that receive normal wear and tear and will reach their expected end of life in the 6–10-year range. Some of these items reflect normal ongoing maintenance that is required to maintain systems. An important and sizable category is the replacement of carpet in Office and Administration areas.

Scope 3 addresses Work Items that will need to be addressed in 10 plus years. At this time the school will be approaching 25 years old and many of these systems such as sidewalks, floor finishes, roofs, air handling units and other mechanical equipment will be at their anticipated end of useful lifespan and will need to be replaced.

Manchester Essex Regional Middle-High School Summary

The Manchester Essex Regional Middle-High School Assessment indicates in current dollars, that a total of nearly $17 million in future spending is anticipated. Of this total close to $760,000 is considered Scope 1 and approximately $1.7 million is considered Scope 2. At approximately $14.5 million, Scope 3 is by far the largest category of anticipated future spending and is due to the expected and limited life span of materials and equipment. The entire building total is $17 million in today's dollars and when inflation is applied and compounded annually to 20 plus years the total is $42 million.

Category	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Total
Building Summary			**Manchester Essex Regional Middle-High School**	
1. SITE	36,595	0	2,367,365	2,403,960
2. BUILDING ENVELOPE	29,250	30,420	5,463,900	5,523,570
3. BUILDING INTERIORS	496,340	1,635,920	2,575,625	4,707,885
4. MECHANICAL	196,300	13,000	3,827,200	4,036,500
5. ELECTRICAL	0	13,000	171,600	184,600
[1]Total:	758,485	1,692,340	14,405,690	16,856,515
[1]Total Inflated @ 5% Compounded Annually	968,040	2,756,644	38,222,584	41,947,268

[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

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EXECUTIVE SUMMARY

The *Executive Summary* recaps the *Total Inflated* row from the bottom of the Building Summary sheets. These costs are then totaled at the bottom to indicate a combined proposed capital expenditure per scope. This is intended to make it easier for the reader to review and compare the overall costs for each of the scopes.

SUMMARY

The *Summary* recaps the *Total* row from the bottom of each category for the subject building, separated into scopes. This is intended to make it easier for the reader to review and compare the overall costs for each of the categories together with the scopes for the subject building.

FACILITY CONDITION ASSESSMENT

The following is a list and brief description of the column and row headings of the Facility Condition Assessment sheets.

Description

The *Descriptions* are the work items identified during our inspection. They usually consist of the building component and its deficiencies; and a recommendation for correcting the deficiency.

Quantity

The number of items: (For example, if the work item is for ”unit ventilators replacement” the building in question may have a *Quantity* of 60 unit ventilators to be replaced).

Unit

The *Units* are identified by a two-letter code. The unit codes are as follows:

SF – Square Foot
SY – Square Yard
LF – Linear Foot
LS – Lump Sum
EA – Each.

Unit Cost

The *Unit Cost* is the cost of one *Quantity* of a work item. Unit costs are preliminary construction cost estimates only and are generally based on the following references: *Means Square Foot Cost Data; Means Construction Costs Data*; in house cost data; professional experience; and information provided by various contractors and suppliers.

Total

The *Total* column is determined by the following equation: QUANTITY x UNIT = TOTAL.

Total with Soft Costs

This assessment provides preliminary construction costs associated with *Soft Costs*. *Soft Costs* generally include a contingency, (typically 10% to 15%) for unforeseen conditions; indirect administrative expenses such as legal costs, printing and advertising (typically 5% to 10%); and architectural and engineering costs (typically 10% to 15%) for a total soft cost estimate. We used a *Soft Cost* of 30% of the *total* cost in this assessment. The *Total with Soft Costs* is determined by the following equation: TOTAL x 1.30 = TOTAL W/ SOFT COST.

Some projects may require higher or lower *Soft Costs* depending on the type and extent of project selected. Work items listed are provided as a guide to develop repair and renovation projects with preliminary construction cost estimates. The actual scope of a project could include a combination of work items, i.e. new ceilings and new lighting. Some other projects may require finishes, e.g. painting, which may not necessarily be broken out for that project.

Essex Elementary School	Manchester Essex Regional Middle-High School
Scope 1 – Necessary / Critical (0-2 years) • Predictable deterioration • Potential downtime • Associated damage or higher costs if deferred further • Safety concerns	**Scope 1** – Necessary / Critical (1-5 years) • Predictable deterioration • Associated damage or higher costs if deferred further • Aesthetic considerations • Safety concerns
Scope 2 – Recommended (3-5 years) • Sensible improvements to existing conditions that are not required for the basic function of the facility • Overall usability improvement • Long term maintenance cost reduction	**Scope 2 –** Recommended (6-10 years) • Predictable deterioration • Associated damage or higher costs if deferred further • Aesthetic considerations • Component is reaching or has reached expected end of useful life
Scope 3 – Does Not Meet Current Codes for new construction but "Grandfathered" OR Recommended (6-10 years) • No action required at this time. However, if a substantial renovation or a substantial building addition is performed in the future, building and accessibility codes may require additional corrective work in addition to the work planned. • The component will exceed its expected life within the next 10-15 years.	**Scope 3 –** Recommended (10+ years) • Predictable deterioration • Associated damage or higher costs if deferred further • Aesthetic considerations • Component has reached expected end of useful life

Totals Column (work items)
The *Totals* column is the sum of the Scopes columns *1, 2,* and *3,* for each work item. The *Totals* column also shares the sum of the *Total* row and *Total Inflated* rows at the lower right corner.

Total Row (scopes)
The *Total* row is the sum of the Scopes columns *1, 2, 3,* and *Totals* column, for each category. The *Total* row and *Total Inflated* rows are totaled at the lower right corner.

Total Inflated Row

The *Total Inflated* row is the sum of the Scopes columns *1, 2, 3,* and *Totals* column for each category multiplied by a coefficient to determine the inflated cost at a rate of 5% and compounded annually.

Essex Elementary School
Scope 1 is shown with an inflation factor for work to be performed within a 2 yr period.
Scope 2 is shown with an inflation factor for work to be performed within a 5 yr period.
Scope 3 is shown with an inflation factor for work to be performed within a 10 yr period.

Manchester Essex regional Middle-High School
Scope 1 is shown with an inflation factor for work to be performed within a 5 yr period.
Scope 2 is shown with an inflation factor for work to be performed within a 10 yr period.
Scope 3 is shown with an inflation factor for work to be performed within a 20 yr period.

The *Total* row and *Total Inflated* rows are totaled at the lower right corner.

The Assessment is broken into five categories with specific evaluation concerns in each:

1. Site
- Storm Drainage
- Drives and Walks
- Landscaping
- Site Improvements
- Play Areas
- Sanitary System
- Accessible Parking and Entrance Approach

2. Building Envelope
- Roofs
- Exterior Walls
- Windows
- Exterior Entrances and Doors
- Thermal Insulation
- Accessible Egress and Ingress
- Building Structural System

3. Building Interiors
- Floor Finishes
- Wall Finishes
- Ceiling Finishes
- Interior Doors and Exitways
- Code Compliance Issues
- Accessibility for the Disabled
- Hazardous Material Remediation

4. Mechanical
- Domestic Hot Water Generation
- Cold Water Services
- Gas Services
- Piping for Plumbing Systems
- Plumbing Fixtures
- Heat Generation
- Cooling System
- Piping for Heating Systems
- Temperature Controls
- Ventilation
- Accessible Plumbing Fixtures

5. Electrical
- Main Services and Distribution
- Convenience Power
- Fire Alarm Systems
- Lighting Systems
- Emergency Lighting Systems
- Communications Systems
- Computer Network & Technology Systems
- Site Lighting
- Electrical Features for the Disabled
- Security System

BUILDING DATA

ESSEX ELEMENTARY SCHOOL

GENERAL INFORMATION:		ARCHITECTURAL COMPONENTS:	
Building:	Essex Elementary School	Foundation:	Reinforced concrete
Address:	12 Story Street, Essex, MA 01929	Super Structure:	1957 building – structural CMU w/ concrete roof deck. 1975 addition – Structural CMU/Steel frame, concrete plank roof deck, Gym-bar joists and metal deck roof.
Main Contact:	Avi Urbas, Director of Finance & Operations	Floor Structure:	Concrete slab on grade and rib-pan framed concrete slab above ground floor.
Facilities Contact:	Jason Waldron, Facilities Manager	Roof Structure:	1957 building – concrete rib-pan frame slab. 1975 addition - structural plank, with long span trusses at Gym.
CODE CLASSIFICATION:		Exterior Walls:	8” CMU with 4” brick veneer (no cavity or insulation) with areas of T1-11 below windows.
Occupancy:	E- Educational, A-3 Assembly @ Gym, Cafetorium & Media Center	Roofing:	Low sloped EPDM membrane with rigid insulation.
Construction Type:	II-B – Unprotected Non-Combustible	Window Systems:	1957 building - wood frame, with single pane operable steel sash 1975 addition - double pane metal windows.
BUILDING HISTORY:		Exterior Doors:	Front entry doors are aluminum storefront, others are hollow metal, while some newer ones are half glass, insulated composite doors.
Original Building:	1957 42,200 SF	Interior Doors:	Wood with hollow metal frames.
Addition:	1975 13,400 SF	Stairs:	Steel spiral stairs lead to basement boiler room.
SITE / BUILDING AREA:		Interior Walls:	CMU, exposed brick, and glazed block.
Site Area:	9.9 acres	Wall Finishes:	Paint on CMU.
Total Building Area:	55,600 SF	Floor Finishes:	Primarily VCT in corridors and classrooms, ceramic tile in toilet rooms, wood cafetorium and gym floor, carpet in library and some staff areas. Epoxy paint on ramp and locker rooms.
Lower-Level Area:	7,900 SF	Ceiling Finishes:	Classrooms have acoustic ceiling tiles attached to concrete plank roof structure, corridors have dropped 2’x4’ acoustic ceiling tiles and Gym has exposed metal deck.
First Floor Area:	47,700 SF		
SITE COMPONENTS:		Conveying Systems:	None.
Parking/Driveways:	Bituminous paving.	MECHANICAL / ELECTRICAL COMPONENTS:	
Walkways:	Bituminous walkways and concrete paving at entrances.	Water Service:	Town Water: Approximately 4” pipe.
Lighting:	Pole mounted at driveway & parking, wall mounted or ceiling mounted lights at building entrances.	Domestic Hot Water:	Stand-alone natural gas fired boiler rated at 215 MBH.
Storm Drainage	Storm drainage system runs to retention pond and adjacent stream.	Fire Suppression:	None.
Sanitary System:	Town sewer via ejector pump system in Boiler Room.	Heating Systems:	Natural gas fired, low pressure, steam boiler, rated at 4260 MBH unit ventilators.
Play Areas:	Wood and metal playground equipment, paved playground areas, 2 basketball backstops, and soccer field.	Cooling Systems:	There are several unit air conditioners in miscellaneous areas.
		Electric Service:	800 amp main service with on-site generator.

Category	Scope 1 (0-2 years)	Scope 2 (3-5 years)	Scope 3 ("Grandfathered" OR 6-10 years)	Total
Building Summary				**Essex Elementary School**
1. SITE	11,044	628,017	88,400	727,461
2. BUILDING ENVELOPE	1,511,900	3,847,773	1,325,935	6,685,608
3. BUILDING INTERIORS	126,035	3,218,223	102,700	3,446,958
4. MECHANICAL	481,000	3,136,640	4,518,410	8,136,050
5. ELECTRICAL	13,000	2,134,600	0	2,147,600
SubTotal of Items that should not be deferred regardless of long-term plans:	2,142,979	3,821,025	0	5,964,004
[1]Total all Items:	2,142,979	12,965,253	6,035,445	21,143,677
[1]Total Inflated @ 5% Compounded Annually	2,362,634	16,547,313	9,831,104	28,741,052

[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

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Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
1. SITE										**ESSEX ELEMENTARY SCHOOL**
1.1 Bituminous paving - At generator, remove existing damaged bituminous and regrade to provide better drainage, provide new paving.	30-40 yrs old	88	SY	30.00	2,640	3,432		3,432		3,432
1.2 Bituminous paving - Replace areas of driveways, play areas and parking areas that are cracked and bowed. Stripe or re-stripe parking and safety zones. Provide stripping to create MAAB/ADA parking spaces at Front Entry.	30-40 yrs old	4,900	SY	30.00	147,000	191,100		191,100		191,100
1.3 MAAB/ADA parking signage - Provide new post mounted sign at accessible parking spaces.	N/A	2	EA	1,000.00	2,000	2,600			2,600	2,600
1.4 Bituminous at Entry - Patch gap between bituminous and concrete at front entry.	30-40 yrs old	15	LF	33.00	495	644	644			644
1.5 Chain-link fence at retaining wall - Prep and paint the rails and posts and replace the damaged chain-link with new.	Not Known	30	LF	40.00	1,200	1,560		1,560		1,560
1.6 Wooden ramp at door 11 - Remove wood handrails and replace with painted steel pipe handrails per MAAB/ADA requirements	Not Known	160	LF	50.00	8,000	10,400			10,400	10,400
1.7 Wooden ramp at door 11 - Remove and replace deteriorated wood components.	Not Known	1	LS	5,000.00	5,000	6,500		6,500		6,500

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
1. SITE										**ESSEX ELEMENTARY SCHOOL**
1.8 Wooden platform and stairs at door 10 - Remove existing wood construction. Provide concrete footings, replace wood with composite material. Note: this work not required if modular addition is removed.	Not Known	150	SF	45.00	6,750	8,775		8,775		8,775
1.9 Doors 2, 3, 6, 7, 10, and 13 have steps and therefore do not meet MAAB/ADA requirements, provide accessible ramps and handrails.	1957 1975	6	EA	8,000.00	48,000	62,400			62,400	62,400
1.10 Accessible parking may have grades too steep to meet required 2% max slope. Regrade/relocate to meet MAAB/ADA requirements	30-40 yrs old	2	EA	5,000.00	10,000	13,000			13,000	13,000
1.11 Lawn areas - Provide 4" of new loam and spread grass seed at areas that are eroded and bare. Revise grading for positive slope away from building.	N/A	15,000	SF	2.00	30,000	39,000		39,000		39,000
1.12 Provide 4" of new loam and shade tolerant ground cover at shady areas under trees throughout.	N/A	1,000	SF	3.00	3,000	3,900		3,900		3,900
1.13 Playing Field - Poor drainage requires installation of new drainage system.	N/A	115,000	SF	2.50	287,500	373,750		373,750		373,750

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
1. SITE										**ESSEX ELEMENTARY SCHOOL**
1.14 Courtyard green house - Replace missing panels of glass and repair raised planting beds. Currently the green house is not able to be used.	Not Known	1	LS	8,000.00	8,000	10,400	10,400			10,400
SubTotal of Items that should not be deferred regardless of long-term plans							11,044	389,025	0	400,069
Total of all items							11,044	628,017	88,400	727,461
[1]Total Inflated @ 5% Compounded Annually							12,176	801,527	143,994	957,697

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
2. BUILDING ENVELOPE										**ESSEX ELEMENTARY SCHOOL**
2.1 Thermally inefficient wall assembly - All exterior brick walls have little to no insulation and do not meet current energy code. Provide code compliant insulation for all walls.	1957 1975	15,200	SF	55.00	836,000	1,086,800			1,086,800	1,086,800
2.2 Efflorescence on Brick - Remove efflorescence observed on chimney and adjacent to modular addition.	1957 1975	200	SF	15.00	3,000	3,900		3,900		3,900
2.3 Brick facade - Provide miscellaneous masonry cleaning and repointing throughout.	1957 1975	2,000	LF	40.00	80,000	104,000		104,000		104,000
2.4 Entire window system is past its useful lifespan and thermally inefficient - Replace entire window system throughout school. Some windows are single pane, while others are dual pane but have no thermal break and many have condensation. Wood trim and sills of the original building are rotted. Newer sills are incorrectly installed and do not correctly shed water. There are reports that building is uncomfortably cold and drafty during the winter.	1957 1975	5,800	SF	200.00	1,160,000	1,508,000	1,508,000			1,508,000
2.5 Hollow Metal Doors 2, 4, 5, 6, 7 (pair), 8, 9 (pair), 11 (pair) and 13 - Replace dented and corroded hollow metal doors and frames, provide new hardware. Door 9, at the Gymnasium, does not open or close properly.	1957 1975	12	EA	2,000.00	24,000	31,200		31,200		31,200

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
2. BUILDING ENVELOPE										**ESSEX ELEMENTARY SCHOOL**
2.6 Insulated composite panel and glazed doors - Replace doors 3, 12, and 14 and their surrounding side lights that are approximately 22 years old and are reaching their useful life span.	2000	3	EA	2,500.00	7,500	9,750		9,750		9,750
2.7 Handrail at Door 12 - Provide MAAB/ADA handrail at left side of stair at Door 12.	N/A	5	LF	50.00	250	325			325	325
2.8 Front entry - Door 1: Provide an additional pair of insulated doors and glass storefront to create an air lock vestibule and to enhance building security.	N/A	120	SF	150.00	18,000	23,400			23,400	23,400
2.9 Create Vestibules - At Secondary Doors 3, 6, 7, 11, 12, and 14: provide additional doors and insulated storefront to create air lock vestibules to bring building up to current energy efficiency codes.	N/A	800	SF	150.00	120,000	156,000			156,000	156,000
2.10 Vestibule at Kitchen - remove current vestibule at Door 13 and replace with new foundation, insulated wall, floor, roof and doors.	2000 +/-	60	SF	220.00	13,200	17,160			17,160	17,160
2.11 Modular addition - Repair water damage to walls due to roof leaks.	2000	150	SF	20.00	3,000	3,900	3,900			3,900
2.12 Modular addition floor system - Provide rigid insulation to bring this area to current energy efficiency codes.	2000 +/-	1,100	SF	20.00	22,000	28,600			28,600	28,600

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
2. BUILDING ENVELOPE										**ESSEX ELEMENTARY SCHOOL**
2.13 Cantilevered concrete roof deck exterior soffits - These surfaces are not finished or weather protected. Moisture infiltration has created spall and rusting of reinforcement. Remove loose concrete, de-rust exposed reinforcing, patch surfaces and apply a cementitious plaster coating.	1957	3,000	SF	20.00	60,000	78,000		78,000		78,000
2.14 Cement plaster exterior ceilings at entries - Remove all loose material, patch and apply a cementitious plaster coating.	1957	520	SF	20.00	10,400	13,520		13,520		13,520
2.15 Roof Ladders - Provide roof ladders to access all levels of roofs.	N/A	4	EA	1,500.00	6,000	7,800		7,800		7,800
2.16 Roof System - Existing roof is approximately 25 years old and past its useful life. It is deteriorated with failed seams, patches, areas of ponding and signs of membrane delaminating from insulation. There are many sources of water infiltration. Immediate repair or replacement is recommended. To replace provide a new light colored roofing membrane (Thermoplastic Polyolefin - TPO) over recovery board, insulation and vapor barrier. Provide new roof to wall flashings. Provide new PT blocking and fascia to allow for thicker roof assembly. Replace all wood trim with composite trim. Replace gutters and downspouts.	1998	48,000	SF	55.00	2,640,000	3,432,000		3,432,000		3,432,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
2. BUILDING ENVELOPE										**ESSEX ELEMENTARY SCHOOL**
2.17 Handrails at Door 3 - Provide a middle MAAB compliant painted pipe handrail and provide compliant painted pipe handrails on both sides of stairs.	1957	30	LF	50.00	1,500	1,950			1,950	1,950
2.18 Handrails at Door 6 - Provide MAAB compliant handrails and guardrails.	N/A	30	LF	50.00	1,500	1,950			1,950	1,950
2.19 Spalling concrete at stairs at Door 3 - Parge concrete stair risers.	1957	25	SF	50.00	1,250	1,625		1,625		1,625
2.20 Painted pipe handrails for steps and ramps at Door 12 are in fair condition - Prep and paint.	1957	45	LF	15.00	675	878		878		878
2.21 Regrade in Courtyard at Kindergarten Rm 18 to provide MAAB/ADA accessibility. Provide loam and hydro-seed.	N/A	1	LS	5,000.00	5,000	6,500			6,500	6,500
2.22 Provide MAAB/ADA handrail at stair at Door 12.	N/A	5	LF	500.00	2,500	3,250			3,250	3,250
2.23 Cap Stones at Chimney not providing sufficient protection - Replace capstones with zinc-coated copper hipped roof cover with mesh bird screen sides. Provide cap flashing base over top of face brick and back-up masonry.	1957	1	EA	5,000.00	5,000	6,500		6,500		6,500

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
2. BUILDING ENVELOPE										**ESSEX ELEMENTARY SCHOOL**
2.24 T1-11 plywood siding - provide new low maintenance, composite siding to replace painted, T1-11 siding that is warped, peeling and has areas that are decayed. The paint may contain lead and would need abatement. This material is found on the modular addition and below some windows in the 1957 portion of the building, including the courtyard.	1957 1975	2,700	SF	30.00	81,000	105,300		105,300		105,300
2.25 Skylights **-** Replace inefficient and failing skylights which have exceeded their useful lifespan, have deteriorated sealants and show signs of end of life cycle with condensation and patches.	1957	6	EA	6,000.00	36,000	46,800		46,800		46,800
2.26 Brick & CMU wall at Gym - Water has infiltrated walls and damage is evident in the painted CMU of the interior. Provide a study to determine if wall has excessive moisture content and is structurally sound. Provide investigation at south wall and also at areas where high wall meets first floor roof and other areas where water infiltration is suspected.	1975	1	LS	5,000.00	5,000	6,500		6,500		6,500
SubTotal of Items that should not be deferred regardless of long-term plans							1,511,900	3,432,000	0	4,943,900
Total of all items							1,511,900	3,847,773	1,325,935	6,685,608
[1]Total Inflated @ 5% Compounded Annually							1,666,870	4,910,842	2,159,808	8,737,520

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
3. BUILDING INTERIORS										**ESSEX ELEMENTARY SCHOOL**
3.1 Doors **-** Replace interior doors and hardware. Wood doors with clear finish show signs of wear and tear with scuff marks, nail holes, and adhesives.	1957 1975	120	EA	2,000.00	240,000	312,000		312,000		312,000
3.2 Ceilings - Provide new 2' x 2' acoustic ceiling tiles and grid in classrooms, corridor ceilings that have not been replaced, offices, Media Center, and Cafetorium. In these areas ceilings are discolored, have miss-matched tiles, are cupping, or are otherwise damaged. Reuse "new" light fixtures where applicable.	1975	45,000	SF	14.00	630,000	819,000		819,000		819,000
3.3 Kitchen Ceilings - Provide new 2' x 4' "kitchen zone" acoustic ceiling tiles and grid.	1975	1,266	SF	16.00	20,256	26,333		26,333		26,333
3.4 Guard rail at ramp near gymnasium - Provide 42" AFF guard rail and code compliant fall protection at existing pipe rail.	1975	50	LF	55.00	2,750	3,575	3,575			3,575
3.5 Kitchen Epoxy Floor - Recoat epoxy floor.	1975	1,270	SF	20.00	25,400	33,020		33,020		33,020
3.6 Signage - Room identification signage at most doors does not meet the MAAB/ADA codes**.** Provide consistent and comprehensive ADA signage throughout the school.	1957 1975	120	EA	75.00	9,000	11,700			11,700	11,700
3.7 Carpet - Carpet is stained, worn out and past its useful lifespan. Replace carpet in Media Center, Kindergarten classroom and offices.	2000 +/-	500	SY	100.00	50,000	65,000	65,000			65,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
3. BUILDING INTERIORS										**ESSEX ELEMENTARY SCHOOL**
3.8 Floor Plate at Ground Level - Replace corroded metal plate at floor at base of ramp.	1957	100	SF	35.00	3,500	4,550		4,550		4,550
3.9 Floor at ramp - Grind to level irregular floor surface, patch and repair.	1975	100	SF	24.00	2,400	3,120		3,120		3,120
3.10 Floor at ramp - Prep and paint ramp with non-slip epoxy finish.	1975	450	SF	20.00	9,000	11,700		11,700		11,700
3.11 Boiler Room Waterproofing Study - Conduct study for foundation waterproofing solution to address chronic water infiltration condition. On the 09-27-22 date of observation, much of the Boiler Room floor was damp and puddled. Equipment is corroded and concrete walls are streaked with water stains.	1957	1	LS	10,000.00	10,000	13,000		13,000		13,000
3.12 Boiler Room Walls - Waterproof damaged concrete walls.	1957	1,000	SF	20.00	20,000	26,000		26,000		26,000
3.13 Casework - Repair or replace miscellaneous casework that has become damaged. Some casework inhibits MAAB/ADA accessibly approach at doors and if substantial renovation occurs this casework will require reconfiguration.	1957	150	LF	400.00	60,000	78,000			78,000	78,000
3.14 Millwork - Repair/replace bookcases, built-in cabinets, and other millwork items that has become damaged.	1957	1	LS	25,000.00	25,000	32,500		32,500		32,500
3.15 Walls - Prep and paint all walls.	1957 1975	70,000	SF	7.00	490,000	637,000		637,000		637,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
3. BUILDING INTERIORS										**ESSEX ELEMENTARY SCHOOL**
3.16 Vinyl composition floor tiles throughout building **-** Replace worn out floors that are approaching the end of their useful lifespan.	2000 +/-	40,000	SF	25.00	1,000,000	1,300,000		1,300,000		1,300,000
3.17 Lockers - Metal student lockers located in Side D corridor are in good condition though there appear to be no MAAB/ADA lockers. Provide repair to minor deficiencies and add accessible lockers.	1957	1	LS	10,000.00	10,000	13,000			13,000	13,000
3.18 Window treatments - Provide new blinds and shades at classrooms, Media Center and office windows. Blinds have recently been replaced and are in good condition, but it is anticipated that they will require replacement once windows are replaced.	2019	171	EA	200.00	34,200	44,460	44,460			44,460
3.19 Window treatments - Provide new curtains at Cafetorium. Curtains are in good condition, but anticipated to need to be replaced once windows are updated.	2018 +/-	10	EA	1,000.00	10,000	13,000	13,000			13,000
SubTotal of Items that should not be deferred regardless of long-term plans							126,035	0	0	126,035
Total of all items							126,035	3,218,223	102,700	3,446,958
[1]Total Inflated @ 5% Compounded Annually							138,954	4,107,359	167,287	4,413,600

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
4. MECHANICAL										**ESSEX ELEMENTARY SCHOOL**
4.1 Multi-User Toilet Rooms - Provide complete renovation of 4 multi-user children's toilets. There have been upgrades over the years in attempts to meet MAAB/ADA codes, yet there are still outstanding violations such as grab bar and dispenser locations and non-compliant urinals. Additionally fixtures do not meet current efficiency standards and ceramic floor tiles are stained and patched.	1957	1,400	SF	650.00	910,000	1,183,000			1,183,000	1,183,000
4.2 Single-User Toilet rooms - There are six single user toilets that do not meet MAAB/ADA code. They are adjacent to Library, at Teacher Room, near Main Office, at Nurse, near Kindergarten and at Kitchen. Provide complete renovation, which will require all new plumbing fixtures, and expansion of some of these rooms.	1957 1975	400	SF	800.00	320,000	416,000			416,000	416,000
4.3 Kindergarten Toilets - Add 2 single-user toilets.	1957	112	SF	800.00	89,600	116,480			116,480	116,480
4.4 Ground Level Toilets **-** Add 2 single-user toilet rooms. Currently there are no toilet facilities on this level.	1957	112	SF	800.00	89,600	116,480			116,480	116,480
4.5 Girls' Locker Room - Current locker room does not have MAAB/ADA fixtures. Provide MAAB/ADA upgrades to a toilet, sink, and shower and provide some accessible lockers. Alternatively, space to be repurposed.	1975	1	LS	150,000	150,000	195,000			195,000	195,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
4. MECHANICAL										**ESSEX ELEMENTARY SCHOOL**
4.6 Boys' Locker Room - There have been minor MAAB/ADA upgrades prior to 2013 to a toilet, a urinal and Shower. To bring up to current MAAB/ADA code provide accessible lockers and modify grab bars, partitions, and dispenser locations. Alternatively, space to be repurposed.	1975	1	LS	150,000	150,000	195,000			195,000	195,000
4.7 Drinking Fountains - Replace all outdated drinking fountains with MAAB/ADA compliant high/low fixtures.	1957 1975	5	EA	8,000.00	40,000	52,000			52,000	52,000
4.8 Classroom sinks & Casework - Replace non-compliant classroom sinks and corresponding cabinetry in all classrooms.	1957	19	EA	7,500.00	142,500	185,250			185,250	185,250
4.9 Fire Protection - Currently there is no sprinkler system. Provide a wet sprinkler system to all areas.	1957 1975	55,600	SF	15.00	834,000	1,084,200			1,084,200	1,084,200
4.10 Existing Boiler has been abandoned in place. Remove, dispose of, and recycle abandoned 1975 boiler.	1975	1	LS	120,000	120,000	156,000	156,000			156,000
4.11 Boiler - There should be two operable boilers, but currently only one is working. This puts the school in a vulnerable position should this one break down. The operable boiler was installed approximately 16 years ago. The average useful life of boilers is 20 years. Provide a new boiler. Service the existing boiler to keep for emergency backup.	2007	1	LS	250,000	250,000	325,000	325,000			325,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
4. MECHANICAL										**ESSEX ELEMENTARY SCHOOL**
4.12 Domestic Hot Water Boiler - This gas fired boiler and hot water storage tank are reaching their expected usable lifespan and require replacement in 3-5 years.	2007	1	LS	15,000.00	25,000	32,500		32,500		32,500
4.13 Electronic Controls - HVAC electronic Johnson Controls have been recently replaced. H&A did not see a need for Capital Improvement at this time.	2020				0	0	0			0
4.14 Kitchen Equipment - Some of the kitchen equipment appears to be original and the remaining equipment seems to be at least 30 years old. It is all past its useful lifespan and equipment should be replaced and an ANSUL kitchen fire suppression system added if a major renovation occurs.	1957 1975	1,500	SF	500.00	750,000	975,000			975,000	975,000
4.15 Heat Distribution System - The current system of ceiling-hung unit ventilators and through-wall unit ventilators in classrooms, radiation cabinets in corridors and cafetorium, ceiling-hung fan-coil units in Gymnasium and Locker Rooms, radiation in baseboard cabinets in offices, and the ductwork associated with these units appear to be original. This entire system is past its expected useable lifespan and should be replaced if a major renovation occurs.	1957 1975	55,600	SF	30.00	1,668,000	2,168,400		2,168,400		2,168,400

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
4. MECHANICAL										**ESSEX ELEMENTARY SCHOOL**
4.16 Split System Air Conditioning - Found in approximately 2,000 square feet at Principal's Office and Ground Level Art Room. The split system units are approximately 5 years old and should be considered for replacement in 10 years.	Varies	2,000	SF	5.00	10,000	13,000		13,000		13,000
4.17 Through-Wall and Window Units Supplemental Air Conditioning - Found in approximately 5,000 SF at the Teachers' Lounge, Rooms 10 and 17, Modular and Library Work Room. Window units are located at the Nurse's Office and Library. All of these units appear to be approximately 10 years or older and are nearing their useful life expectancy.	Varies	5,000	SF	4.00	20,000	26,000		26,000		26,000
4.18 Expanded Building Air Conditioning - To enhance the learning environment and summer programs, a study is suggested to determine feasibility and cost of such a system.	N/A	1	LS	10,000.00	10,000	13,000		13,000		13,000
4.19 Sanitary service to municipal system - Replace 66 year old system if a major renovation occurs. This system enters the building into the basement Boiler Room.	1957	1	LS	100,000	100,000	130,000		130,000		130,000
4.20 Gas Service **-** This service is approximately 20 years old and may require replacement in 10 or more years. Gas service location is at east wall at Room 17 and enters the basement Boiler Room.	2003 +/-	1	LS	35,000.00	35,000	45,500		45,500		45,500

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
4. MECHANICAL										**ESSEX ELEMENTARY SCHOOL**
4.21 Domestic water service from municipal system - Replace 66 year old system which enters the building into the basement Boiler Room if a major renovation occurs.	1957	1	LS	30.00	100,000	130,000		130,000		130,000
4.22 Hard water - Install a point of entry water filtration/softener system to remove corrosive minerals from the town supplied water. This will help protect the mechanical and plumbing equipment.	N/A	55,600	SF	8.00	444,800	578,240		578,240		578,240
SubTotal of Items that should not be deferred regardless of long-term plans							481,000	0	0	481,000
Total of all items							481,000	3,136,640	4,518,410	8,136,050
[1]Total Inflated @ 5% Compounded Annually							530,303	4,003,236	7,360,014	11,893,552

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
5. ELECTRICAL										**ESSEX ELEMENTARY SCHOOL**
5.1 Electric Service - 800 amp 120/208 volt 3 phase is at maximim capacity. Upgrade is recommended if load increases or building renovation occurs.	1957 1975	1	LS	500,000	500,000	650,000		650,000		650,000
5.2 Power distribution systems - Power distribution appear to be original 66-year-old equipment. Replace outdated electrical wiring and sub-distribution system if building renovation occurs.	1957 1975	55,600	SF	15.00	834,000	1,084,200		1,084,200		1,084,200
5.3 Emergency Generator - Conduct load test to determine capability of existing emergency generator.	2000	1	EA	5,000.00	5,000	6,500	6,500			6,500
5.4 Lighting Fixtures - Fixtures have been upgraded to LED through a Green Communities grant. Therefore, there is no need to provide new fixtures unless a major building renovation occurs.	2016				0	0		0		0
5.5 Emergency Lighting System - System is approximately 12 years old, replace with new system if major building renovation occurs.	2010 +/-	55,600	SF	5.00	278,000	361,400		361,400		361,400
5.6 Pole mounted Site Lighting - No need seen for replacement, provide ongoing repair/replacement maintenance.	1957 1975	1	LS	5,000.00	5,000	6,500	6,500			6,500

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1	Scope 2	Scope 3	Totals
5. ELECTRICAL										**ESSEX ELEMENTARY SCHOOL**
5.7 Perimeter Building Lighting and Wall mounted Building Lighting - Fixtures vary in age but are reaching their expected usable life.	1957 1975	1	LS	30,000.00	30,000	39,000		39,000		39,000
SubTotal of Items that should not be deferred regardless of long-term plans							13,000	0	0	13,000
Total of all items							13,000	2,134,600	0	2,147,600
[1]Total Inflated @ 5% Compounded Annually							14,333	2,724,351	0	2,738,683

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

ESSEX ELEMENTARY SCHOOL

1. Bituminous driveway shows signs of cracking and freeze/thaw damage.

2. Original windows and trim have deteriorated.

3. Operable steel hopper window has no weather strip.

4. Thermal pane window has seal failure.

5. The wood siding is rotted and damaged.

6. The concrete facias and soffits have spalled.

7. Original roof soffits have corroded.

8. Modular addition has deteriorated and leaks at connection to main building.

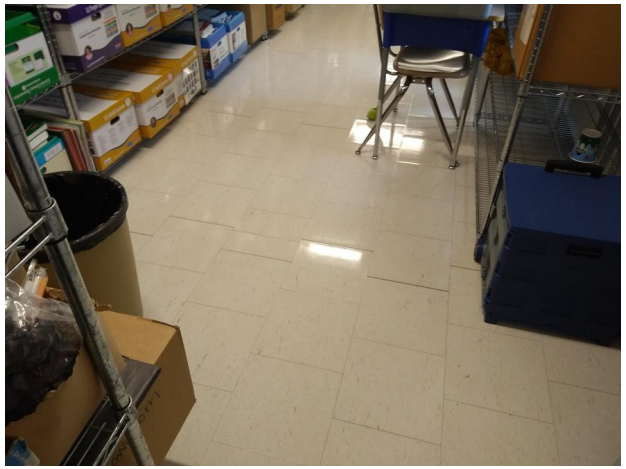
9. Confirm that generator has been maintained per manufacturer's recommendations.

10. Bituminous pavement is damaged, original hollow metal doors require repair/replacement.

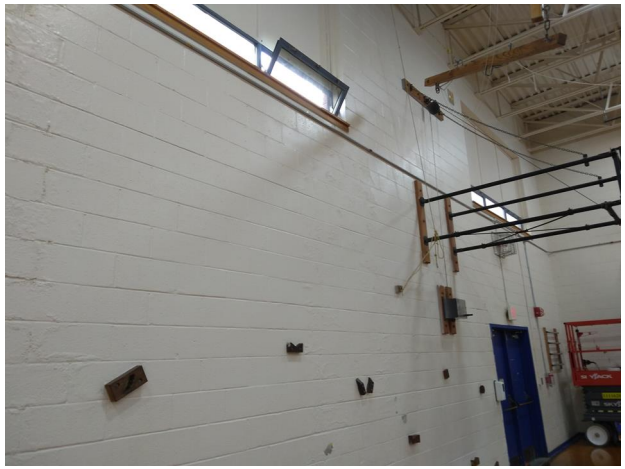
11. Rubber membrane roof has many areas of standing water and is extensively patched.

12. There are areas where the roof has bubbled and the membrane is no longer adhered.

13. The fascia is rotted at the Cafetorium.



14. Vinyl floor tiles in Modular addition show signs which may indicate issues with subfloor.



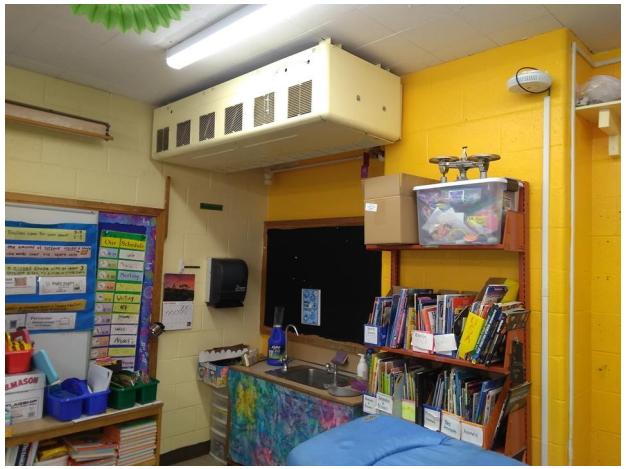
15. The brick/CMU wall of Gym shows signs of extensive water damage and is not insulated.

16. Classrooms have outdated spline ceiling and insufficient ventilation.

17. Existing 2x4 ceiling tiles have sagged and are cupped.

18. The skylights in the corridors are damaged.

19. Existing 2x4 ceilings are discolored and tiles are mis-matched.



20. Classrooms have outdated and inefficient unit ventilators.

21. Classrooms have outdated sinks that do not meet AAB accessibility requirements.

22. Multi-user toilet rooms have original, outdated fixtures and several have no AAB updates.

23. Grab bars/accessories are non-compliant and original tile floor is patched.

24. Single-user toilet rooms do not meet AAB requirements.

25. All drinking fountains are original and are not AAB compliant.

26. Kitchen equipment is very old and inefficient.

27. This 1975 era boiler is no longer being used.

28. This boiler was installed in 2008 and still functions.

29. This Air Handling Unit in the crawl space is obsolete.

30. Boiler room shows signs of chronic flooding, equipment is obsolete and inefficient.

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BUILDING DATA

MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL

GENERAL INFORMATION:		ARCHITECTURAL COMPONENTS:	
Building:	Manchester Essex Regional Middle-High School	Foundation:	Reinforced concrete.
Address:	36 Lincoln Street Manchester-by-the-Sea, MA 01944	Super Structure:	Structural steel.
Main Contact:	Avi Urbas, Director of Finance & Operations	Floor Structure:	Reinforced concrete slab on grade and concrete in metal pan over steel.
Facilities Contact:	Jason Waldron, Facilities Manager	Roof Structure:	Steel deck, joists, and trusses.
CODE CLASSIFICATION:		Exterior Walls:	Insulated brick wall system.
Occupancy:	E-Educational, A-3 Assembly @ Auditorium, Gym, Cafeteria & Media Center	Roofing:	Thermoplastic Polyolefin (TPO) roofing at low sloped area, asphalt shingles on moderately sloped roofs.
Construction Type:	II-A Protected Non-Combustible	Window Systems:	Aluminum frames and insulated glass.
BUILDING HISTORY:		Exterior Doors	Insulated aluminum and glass.
Original Building:	2009	Interior Doors	Wood doors with hollow metal frames.
Addition:	NA	Stairs:	Steel pan.
SITE / BUILDING AREA:		Interior Walls:	Approximately 95% metal stud walls with gypsum wallboard and 5% CMU walls in utility areas.
Site Area:	19.3 Acres (this includes two parcels at 36 & 40 Lincoln Street)	Wall Finishes:	Paint over GWB and CMU, with composite panels at corridors.
Total Building Area:	162,000 SF	Ceiling Finishes:	2'x2' and 2'x4' acoustic ceiling tiles and some GWB in most areas with metal panel at Gymnasium, and Auditorium. Additionally, the Auditorium has suspended acoustic treatment.
First Floor:	31,000 SF		
Second Floor:	63,000 SF	Conveying Systems:	Elevator.
Third Floor:	41,000 SF	MECHANICAL / ELECTRICAL COMPONENTS:	
Fourth Floor:	27,000 SF	Water Service:	4" domestic water service.
Mezzanine:	1,000 SF	Domestic Hot Water:	Gas fired water heater.
SITE COMPONENTS:		Fire Suppression:	100% sprinklered.
Parking/Driveways:	Bituminous paving.	Heating Systems:	Gas fired boilers.
Walkways:	Concrete.	Cooling Systems:	A/C in limited areas., rooftop chiller.
Lighting:	Light sconces on façades, site lighting on poles, and athletic lighting on poles.	Electric Service:	200 amp main service and solar.
Storm Drainage	Catch basins.		
Sanitary System:	Town sewer.		
Play Areas:	Artificial turf athletic field.		

Category	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Total
Building Summary	**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**			
1. SITE	36,595	0	2,367,365	2,403,960
2. BUILDING ENVELOPE	29,250	30,420	5,463,900	5,523,570
3. BUILDING INTERIORS	496,340	1,635,920	2,575,625	4,707,885
4. MECHANICAL	196,300	13,000	3,827,200	4,036,500
5. ELECTRICAL	0	13,000	171,600	184,600
[1]Total:	758,485	1,692,340	14,405,690	16,856,515
[1]Total Inflated @ 5% Compounded Annually	968,040	2,756,644	38,222,584	41,947,268

[1]Totals include Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
1. SITE							**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**			
1.1 Damaged concrete at rail posts - Patch areas of concrete spall (most evident at rail posts).	2009	100	SF	24.00	2,400	3,120	3,120			3,120
1.2 Open joints at rail posts - Provide sealant at posts into concrete to help prevent further concrete spall.	2009	40	EA	50.00	2,000	2,600	2,600			2,600
1.3 Damaged concrete at stairs - Patch stair treads at stairs near cafeteria.	2009	10	EA	175.00	1,750	2,275	2,275			2,275
1.4 Sidewalks - Replace sealant that has shrunk and is pulling away from concrete.	2009	500	LF	12.00	6,000	7,800	7,800			7,800
1.5 Turf Fields - Replace regulation sized football turf fields. District shares are Hyland Field is 50%; 100% of Brook Street. Projected to around 2038.	2023	1.5	EA	700,000	1,050,000	1,365,000			1,365,000	1,365,000
1.6 Bituminous paving - Seal miscellaneous cracks in parking areas and driveways. Ongoing maintenance required.	2009	2,000	LF	8.00	16,000	20,800	20,800			20,800
1.7 Bituminous paving - Replace bituminous pavement as it reaches its anticipated end of useful lifecycle. Projected to around 2040.	2009	13,455	SY	30.00	403,650	524,745			524,745	524,745
1.8 Sidewalks - Replace sidewalks as they reach their anticipated end of useful lifecycle. Projected to sometime around 2050.	2009	3,674	SY	100.00	367,400	477,620			477,620	477,620
Total							36,595	0	2,367,365	2,403,960
[1]Total Inflated @ 5% Compounded Annually							46,706	0	6,281,324	6,328,030

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
2. BUILDING ENVELOPE										**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**
2.1 Exterior door weather stripping - Provide new door weatherstripping and sweeps.	2009	40	EA	250.00	10,000	13,000	13,000			13,000
2.2 Brick - Wash off light efflorescence at several miscellaneous areas. This is recommended so that the efflorescence does not move deeper into the substrate and cause subflorescence which can lead to spalling.	2009	200	SF	10.00	2,000	2,600		2,600		2,600
2.3 Caulking and Sealants - Replace sealants where early signs of failure is evident. Regular maintenance required on a 10 year basis.	2009	300	LF	15.00	4,500	5,850	5,850			5,850
2.4 Gutter Covers - Provide gutter covers in areas that trap debris.	2009	100	LF	80.00	8,000	10,400	10,400			10,400
2.5 Metal lintels - Prep and paint.	2009	1	LS	2,000.00	2,000	2,600		2,600		2,600
2.6 Exposed Wood Members - Prep and refinish.	2009	240	SF	25.00	6,000	7,800		7,800		7,800
2.7 Hollow metal doors - Prep and paint.	2009	4	EA	300.00	1,200	1,560		1,560		1,560
2.8 Hole in Door at Entry 9 - Replace hardware or patch hole where hardware was removed. Prep and paint patches.	2009	1	EA	1,000.00	1,000	1,300		1,300		1,300
2.9 Low Sloped TPO Roof - Replace roof in 10-15 years**.**	2009	40,600	SF	55.00	2,233,000	2,902,900			2,902,900	2,902,900
2.10 Fiberglass Shingle Roof - Replace roof in 15-20 years.	2009	39,400	SF	50.00	1,970,000	2,561,000			2,561,000	2,561,000
2.11 Abandoned Metal Panel - Remove from brick surface, patch 10 bolt holes and clean brick.	2009	1	LS	1,200.00	1,200	1,560		1,560		1,560

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
2. BUILDING ENVELOPE										**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**
2.12 Miscellaneous repair and maintenance - paint window sun awnings.	2009	1	LS	10,000.00	10,000	13,000		13,000		13,000
Total							29,250	30,420	5,463,900	5,523,570
[1]Total Inflated @ 5% Compounded Annually							37,331	49,551	14,497,353	14,584,236

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
3. BUILDING INTERIORS							**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**			
3.1 Aluminum door thresholds **-**Provide aluminum thresholds at pairs of interior vestibule doors at front entry.	2009	2	EA	800.00	1,600	2,080	2,080			2,080
3.2 Damage at window sill and jamb - Prep and paint drywall and prep and refinish window sills that have water damage. These are located at fourth floor near Faculty Workroom and above front entry.	2009	1	LS	1,500.00	1,500	1,950		1,950		1,950
3.3 Walls throughout building - provide minor paint touch up. Ongoing maintenance will be required.	2009	500	SF	7.00	3,500	4,550	4,550			4,550
3.4 Prepare and re-paint all interior walls and painted surfaces.	2009	135,000	SF	7.00	945,000	1,228,500			1,228,500	1,228,500
3.5 Linoleum floor joints - Repair damaged or missing floor joints at linoleum floors.	2009	250	LF	20.00	5,000	6,500	6,500			6,500
3.5b Linoleum Floor - The linoleum floor requires ongoing maintenance, has cracks and delamination. Repair and maintain.	2009	800	SY	150.00	120,000	156,000		156,000		156,000
3.6 Vinyl Composition Floor Tile - replace damaged floor tiles in misc. areas through out building.	2009	300	SF	25.00	7,500	9,750	9,750			9,750
3.7 Auditorium Carpet - Replace this carpet as it is worn out and is reaching its useful lifespan.	2009	300	SY	225.00	67,500	87,750	87,750			87,750
3.8 Auditorium Stair Treads **-** At carpeted stair treads in Auditorium, provide stair nosings with contrasting tones for visibility and safety.	2009	56	EA	75.00	4,200	5,460	5,460			5,460

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
3. BUILDING INTERIORS							**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**			
3.9 Middle School Carpet - Replace carpet that is stained, worn, and has reached its useful expected lifespan.	2009	1,300	SY	225.00	292,500	380,250	380,250			380,250
3.9a Administration & Office Carpets **-** Carpet at Central Administration, High School Administration, Middle School Administration, SPED Offices, High School Classrooms, Music Wing, MIDI Lab, Media Center, Guidance area, Distance Learning, and SPED Testing.- Replace carpet in these areas as they reach their useful expected lifespan.	2009	4,500	SY	225.00	1,012,500	1,316,250		1,316,250		1,316,250
3.10 Replace all VCT, Rubber, and Linoleum flooring throughout Middle and High School.	2009	41,450	SF	25.00	1,036,250	1,347,125			1,347,125	1,347,125
3.11 Laminated wall panels **-** Selectively **r**eplace wall panels in the main corridors that have been warping and falling off.	2009	200	EA	500.00	100,000	130,000		130,000		130,000
3.12 Chair rail **-** Refinish miscellaneous areas of corridor chair rail that has become damaged.	2009	300	LF	20.00	6,000	7,800		7,800		7,800
3.13 Fabric acoustic panels **-** Replace or repair fabric acoustic panels that have delaminated in Auditorium.	2009	8	EA	800.00	6,400	8,320		8,320		8,320
3.14 Repair/replace casework that has become damaged.	2009	30	LF	400.00	12,000	15,600		15,600		15,600
Total							496,340	1,635,920	2,575,625	4,707,885
[1]Total Inflated @ 5% Compounded Annually							633,470	2,664,741	6,833,900	10,132,111

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
4. MECHANICAL										**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**
4.1 Hard water - Install a point-of-entry water filtration/softener system to remove corrosive minerals from the town-supplied water.	2009	16,000	SF	8.00	128,000	166,400	166,400			166,400
4.2 Duct insulation - Replace and/or repair missing and/or damaged duct insulation.	2009	200	SF	30.00	6,000	7,800	7,800			7,800
4.3 Pipe insulation - Replace and/or repair missing and/or damaged pipe insulation.	2009	100	LF	20.00	2,000	2,600	2,600			2,600
4.4 HVAC glycol feeder system - Typical useful life is 10 years.	c2000	1	LS	10,000.00	10,000	13,000		13,000		13,000
4.5 AHU-1, 3, 9, and 10 - Typical useful life is 15 to 25 years.	2009	4	EA	167,000	668,000	868,400			868,400	868,400
4.6 AHU-2 - Hot water coil replaced 2014 - Typical useful life is 15 to 25 years.	2009	1	EA	167,000	167,000	217,100			217,100	217,100
4.7 AHU-4 and 5, w/cooling coils, stage and auditorium - Supply fans replaced 2021 and 2015 respectively- Typical useful life is 15 to 25 years.	2009	2	EA	185,000	370,000	481,000			481,000	481,000
4.8 AHU-6 - Return fan and frequency drive replaced 2014 - Typical useful life is 15 to 25 years.	2009	1	EA	167,000	167,000	217,100			217,100	217,100
4.9 AHU-7 and 8 - w/cooling coil, Media Center and Upper Admin, return fan replaced 2021 and 2014 respectively- Typical useful life is 15 to 25 years.	2009	2	EA	185,000	370,000	481,000			481,000	481,000
4.10 AHU-11 and 12, w/cooling coils, Central Admin, 1st Floor MS - Typical useful life is 15 to 25 years.	2009	2	EA	185,000	370,000	481,000			481,000	481,000

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
4. MECHANICAL									**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**	
4.11 Boiler 1 - Typical useful life is 25 years.	2009	1	EA	250,000	250,000	325,000			325,000	325,000
4.12 Boiler 2 - Typical useful life is 25 years.	2009	1	EA	250,000	250,000	325,000			325,000	325,000
4.13 Pump 1 - Typical useful life is 20 years.	2009	1	EA	25,000.00	25,000	32,500			32,500	32,500
4.14 Pump 2 - Frequency drive replaced 2016- Typical useful life is 20 years.	2009	1	EA	25,000.00	25,000	32,500			32,500	32,500
4.15 HV-1 - Typical useful life is 20 years	2009	1	EA	10,000.00	10,000	13,000			13,000	13,000
4.16 HV-2 - Fan assembly replaced 2018 - Typical useful life is 20 years.	2009	1	EA	10,000.00	10,000	13,000			13,000	13,000
4.17 MUA-1 - Frequency drive replaced 2019 - Typical useful life is 24 years.	2009	1	EA	12,000.00	12,000	15,600			15,600	15,600
4.18 Rooftop Chiller CH-1 - Typical useful life is 20 years.	2009	1	EA	250,000	250,000	325,000			325,000	325,000
4.19 Add A/C to additional areas of the school to support summer programs - Provide study to determine feasibility and cost.	NA	1	EA	15,000	15,000	19,500	19,500			19,500
Total							196,300	13,000	3,827,200	4,036,500
[1]Total Inflated @ 5% Compounded Annually							250,534	21,176	10,154,701	10,426,411

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

Work Item Description	Year Inst.	Qty	Unit	Unit Cost	Total	[1]Total w/ Soft Costs	Scope 1 (1-5 years)	Scope 2 (6-10 years)	Scope 3 (10+ years)	Totals
5. ELECTRICAL									**MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL**	
5.1 Pole mounted Site Lighting - No need seen for replacement, provide ongoing repair/replacement maintenance.	2009	1	LS	10,000.00	10,000	13,000		13,000		13,000
5.2 Lighting - Replace lighting fixtures at end of expected life in 2050**.**	2023	16,000	SF	8.00	128,000	166,400			166,400	166,400
5.3 Battery Back-Up - Battery back-up for fire alarm panels and BMS controls - Typical useful life 5 years**.**	2023	2	EA	2,000.00	4,000	5,200			5,200	5,200
Total							0	13,000	171,600	184,600
[1]Total Inflated @ 5% Compounded Annually							0	21,176	455,306	476,482

[1]Total includes Soft Costs (30%): Contingency, Administration and A/E Fees.

MANCHESTER ESSEX REGIONAL MIDDLE-HIGH SCHOOL

1. Concrete has spalled at some rail posts.

2. Rail posts do not have sealants and some sealants are failing.

3. Some gutters are clogged with vegetation.

4. Some sealant shows early signs of deterioration.

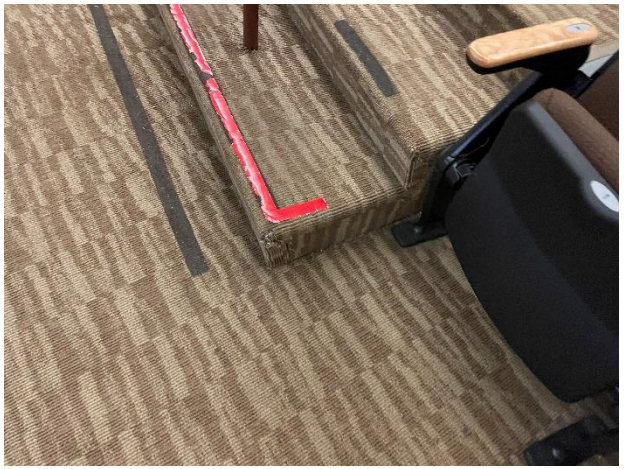
5. Sealant at metal panel is showing signs of deterioration.

6. Discoloration is evident at wood accents, brick and precast.

7. Threshold at entry is damaged. Walk off matt is worn.

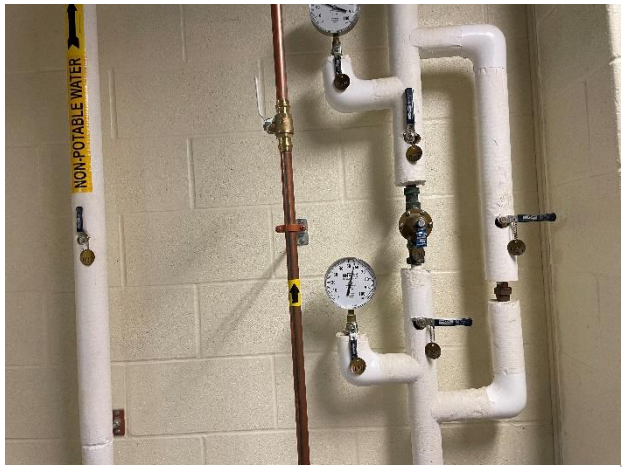
8. Some floor joints at natural linoleum are damaged.

9. Several windows show signs of water damage.



10. Original carpet at Auditorium is showing signs of wear.

11. Some duct work has damaged or missing insulation.



12. Plumbing valves require frequent replacement due to high mineral content in water supply.

Appendix A:

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
Equipment Life Expectancy Chart

Appendix B:

Essex Elementary School Roof Asset Management Program
Dated: April 03, 2021
Prepared by: The Garland Company, Inc.

Appendix C:

Essex Elementary School Asbestos 3-Year Reinspection Report and Management Plan
Dated: January 22, 2022
Prepared by: Atlas Consulting

ASHRAE Equipment Life Expectancy chart

ASHRAE is the industry organization that sets the standards and guidelines for most all HVAC-R equipment. For additional info about ASHRAE the website is www.ashrae.org .

Equipment Item	Median Years
Air conditioners	
Window unit	10
Residential single or Split Package	15
Commercial through-the wall	15
Water-cooled package	15
Heat Pumps	
Residential air-to-air	15
Commercial air-to-air	15
Commercial water-to-air	19
Roof-top air conditioners	
Single-zone	15
Multi-zone	15
Boilers, hot water (steam)	
Steel water-tube	24 (30)
Steel fire-tube	25 (25)
Cast iron	35 (30)
Electric	15
Burners	21
Furnaces	
Gas- or oil-fired	18
Unit heaters	
Gas or electric	13
Hot water or steam	20
Radiant Heaters	
Electric	10
Hot water or steam	25

Equipment Item	Median Years
Air terminals	
Diffusers, grilles, and registers	27
Induction and fan coil units	20
VAV and double-duct boxes	20
Air washers	17
Ductwork	30
Dampers	20
Fans	
Centrifugal	25
Axial	20
Propeller	15
Ventilating roof-mounted	20
Coils	
DX, water, or steam	20
Electric	15
Heat Exchangers	
Shell-and-tube	24
Reciprocating compressors	20
Packaged chillers	
Reciprocating	20
Centrifugal	23
Absorption	23
Cooling towers	
Galvanized metal	20
Wood	20
Ceramic	34

Equipment Item	Median Years
Air-cooled condensers	20
Evaporative condensers	20
Insulation	
Molded	20
Blanket	24
Pumps	
Base-mounted	20
Pipe-mounted	10
Sump and well	10
Condensate 15	
Reciprocating engines	20
Steam turbines	30
Electric motors	18
Motor starters	17
Electric transformers	30
Controls	
Pneumatic	20
Electric	16
Electronic	15
Valve actuators	
Hydraulic	15
Pneumatic	20
Self-contained	10

The Garland Company, Inc.

Roof Asset Management Program

RAMP

Essex Elementary School

Prepared By

Rob Verreault

Prepared For

Jason Waldron

April 03, 2021

Appendix B

B-2

Client Data

Client: Manchester Essex Regional School District

Client Data

Name	Manchester Essex Regional School District		
Address 1	36 Lincoln Street		
City	Manchester	**State**	Massachusetts
ZIP	01944	**Country**	United States

Contact Info

Contact Person	Jason Waldron	**Title**	Facility Manager
Mobile Phone:	-	**Office Phone:**	-
Email:	-		

Facility Summary

Client: Manchester Essex Regional School District

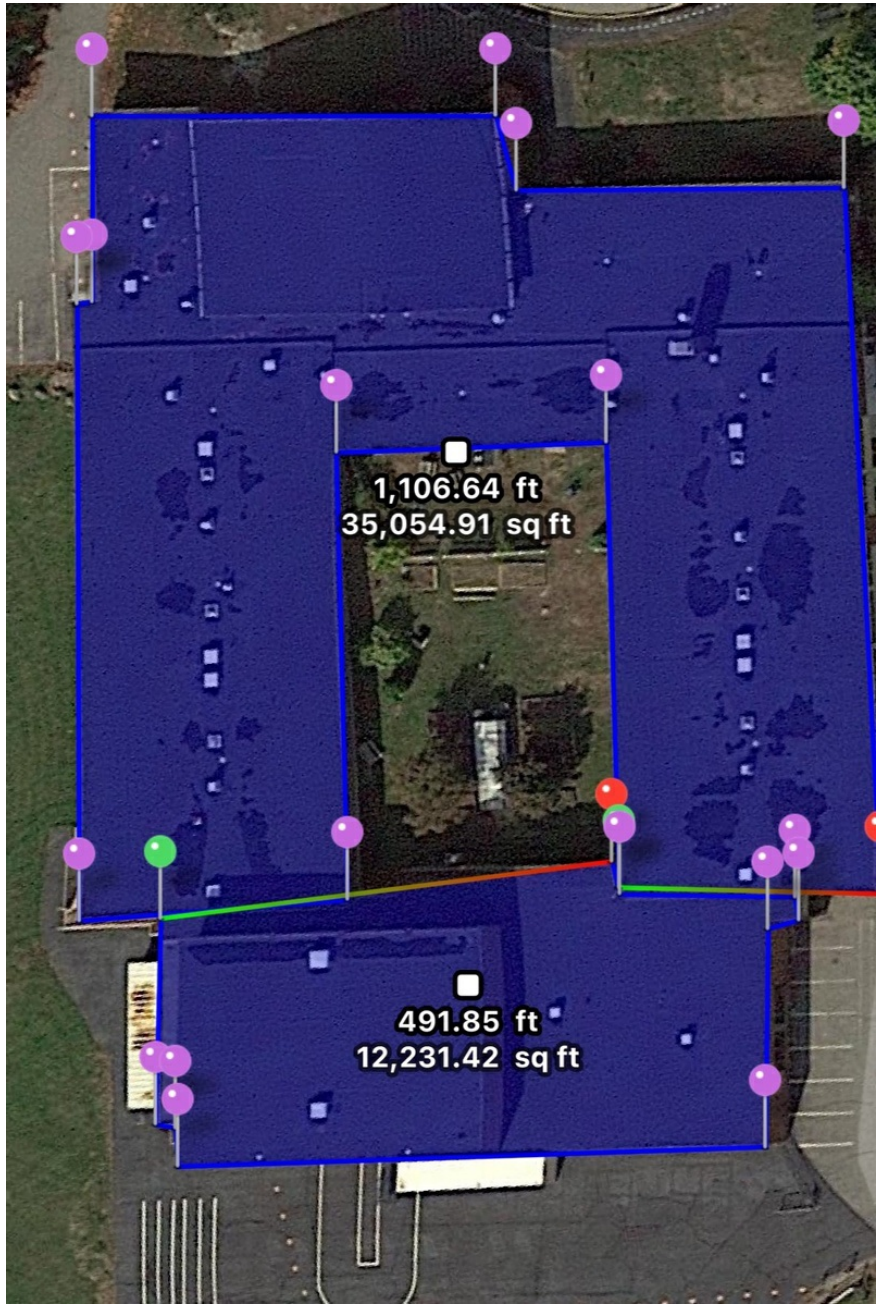
Facility: Essex Elementary

Facility Data

Address 1	12 Story Street
City	Essex
State	Massachusetts
ZIP	01929
Type of Facility	School
Square Footage	48,000
Contact Person	Jason Waldron

Asset Information

Name	Date Installed	Square Footage	Roof Access
Main Roof Section	1998	48,000	Attached Ladder



B-4

Photo Report

Client: Manchester Essex Regional School District
Facility: Essex Elementary
Roof Section: Main Roof Section

Report Date: 04/03/2021
Title: Photo Report

Assessment - An inspection was performed on the Essex Elementary School roof on March 15th 2021. The EPDM roof was observed to be in fair to poor condition. No date stamps were found but it is believed that the roof is over 20 years old. The typically life span of an EPDM roof is typically 20-25 years. This roof assembly has began to show signs of failure that are typically associated with an aging EPDM roof.

A few areas of ponding water were observed and leaks have been reported from those general areas. Approximately 50 other failed or failing conditions were observed.

Recommendations - Immediate repair/maintenance are needed to preserve the roofing assembly from further accelerated failure.

It is also recommended that a seam and flashing restoration is performed within the next 1-3 years. This will help extend the life of the roof approximately 8-10 years. Given the age of the EPDM roof it is very common to experience most failures at seams and flashing, they are the weak links of the membrane. Many seam and flashing failures have already been observed.

Budgets - Immediate repairs will cost around $5200. I can facilitate providing 3 bid from local contractors to do the work.

It is recommended to budget approximately $4000 per year moving forward for miscellaneous maintenance and leak repair.

It is recommended to pursue a seam and flashing restoration in the next 1-3 years. This will entail a peel and stick felt backed tape being applied to all seams and flashing. A polyurethane coating will then be applied to the previously applied tape. This will reinforce all seams and flashing and prevent leaks and gross failures of the roofing assembly at the most vulnerable points. This will help extend the life of the roof approximately 8-10 years. A rough budget for a seam/flashing restoration is $30,000-35,000

After Care - Annual inspections will be important for this roof assembly due to the age. If we can catch potential problems before the arise you will be able to stretch the life span on the roof assembly.

State Contract TRD04 is a good option to procure a contractor for a potential seam/flashing restoration. I can discuss this in further detail.

B-6

Photo 1

Overview of roof section.

Photo 2

Overview of roof section.
"Dirty" area indicates ponding water.

Photo 3

Failed seam in ponding area.

Photo 4

Deteriorating coverstrip repair over seam.

B-7

B-8

Photo 5

Previously repaired open condition at lap in edge metal.

Photo 6

Previously repaired laps in edge metal.

Photo 7

Overview of roof section.

Photo 8

Penetration in membrane.
This is a source of water infiltration to the roofing assembly.

B-10

Photo 9

Failed patch over lap in edge metal.
This failed condition was observed in approximately 30 locations.

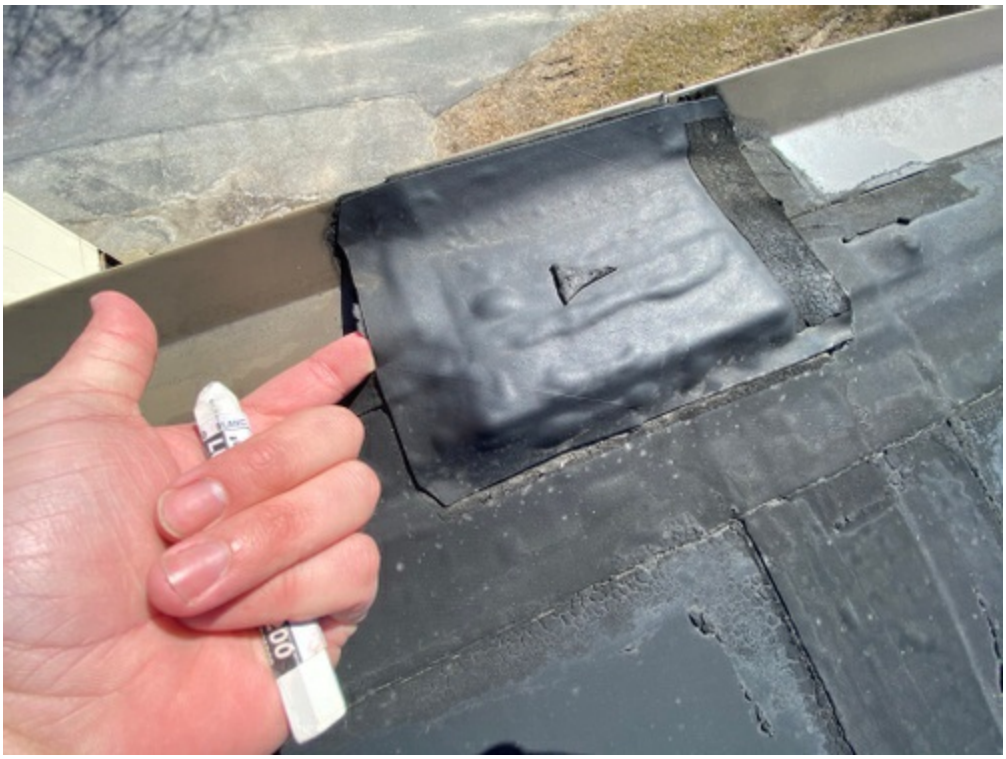


Photo 10

Failed patch over lap in edge metal.
This failed condition was observed in approximately 30 locations.

Photo 11

Failed patch over lap in edge metal.
This failed condition was observed in approximately 30 locations.

Photo 12

Area of delaminated membrane from insulation.

B-11

B-12

Photo 13

Debris on roof.

Photo 14

Multiple penetrations observed in membrane.
This is a source of water infiltration to the roofing assembly.

The following conditions are associated with water infiltration:
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

Photo 15

Failed flashing around pitch pocket.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

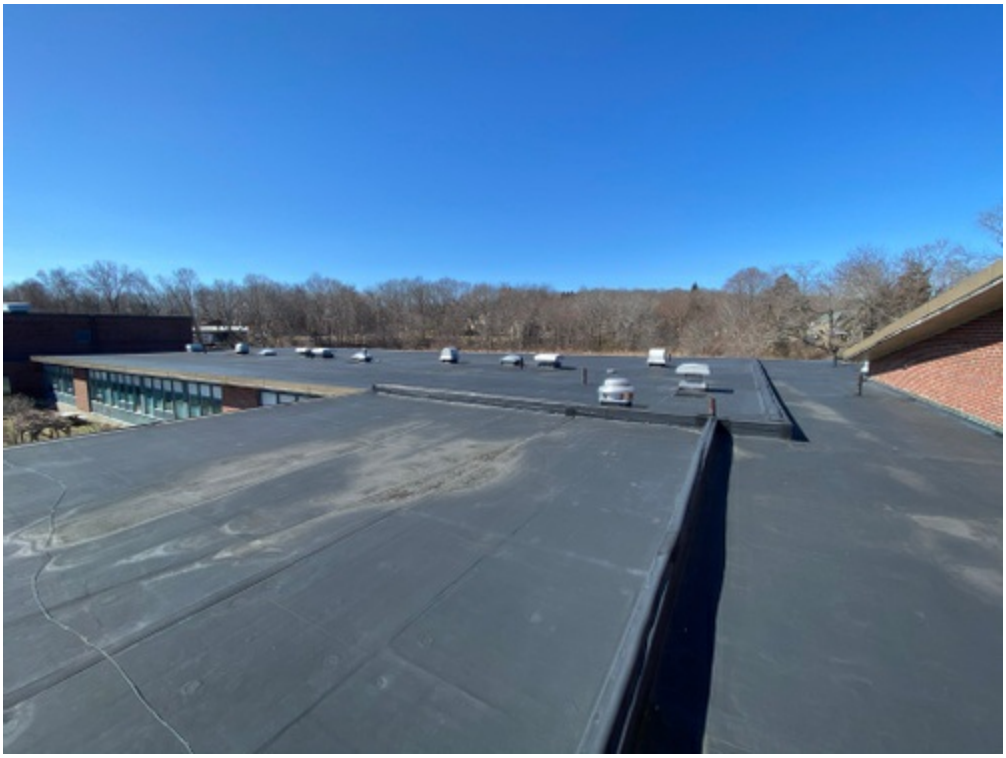


Photo 16

Overview of roof section.

B-14

Photo 17

Overview of roof section.

Photo 18

Penetration in membrane above fastener location.

Photo 19

Failed flashing.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

Photo 20

Rotted fascia board under edge metal.

B-16

Photo 21

Rotted fascia board under edge metal.

Photo 22

Failed patch.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

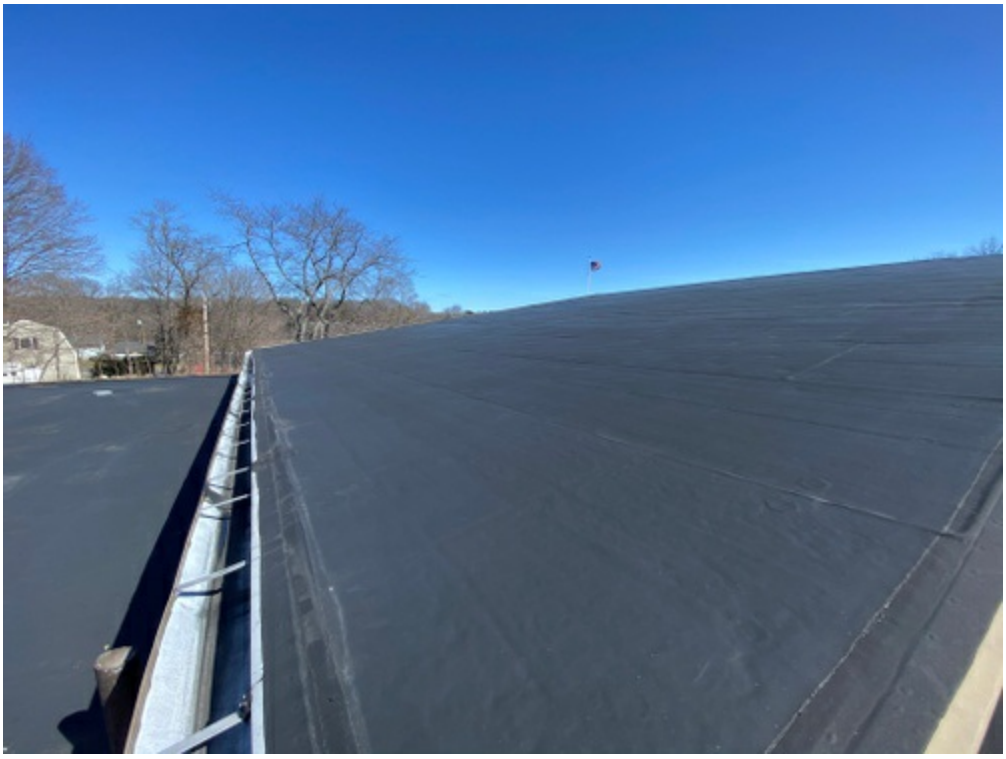


Photo 23

Overview of pitched roof section.

Photo 24

Failed flashing above gutter.

B-17

B-18

Photo 25

Failed corner flashing.
This is a source of water infiltration to the roofing assembly.

The following conditions are associated with water infiltration:
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

Photo 26

Failed vertical flashing.
This is a source of water infiltration to the roofing assembly.

The following conditions are associated with water infiltration:
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

Photo 27

Failed patch over lap in edge metal.
This failed condition was observed in approximately 30 locations.

Photo 28

Failed patch.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

B-20

Photo 29

Failed patch.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

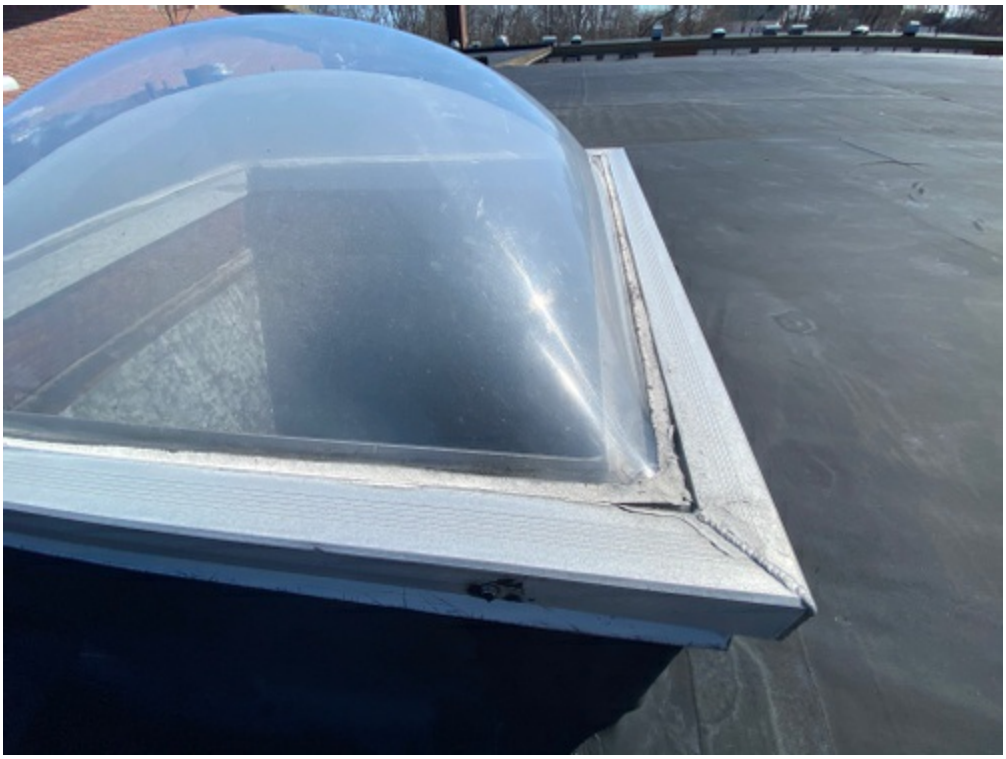


Photo 30

Deteriorated sealant around skylight.

Photo 31

Fasteners were observed around the roof.
These are potential puncture points in the membrane.

Photo 32

Condensation was observed between the layers of the skylight.
This is a sign of end of life cycle.

B-21

B-22

Photo 33

Repaired skylight.

Photo 34

Missing drain basket.

Photo 35

Deteriorated sealant above surface mounted termination bar.

Photo 36

Failed patch.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

B-24

Photo 37

Overview of roof section.

Photo 38

Failed patch.
This is a source of water infiltration to the roofing assembly.

<u>The following conditions are associated with water infiltration:</u>
Interior water damage
Mold/Mildew
Saturated insulation resulting in lose of dimensional stability and R Value
Delamination of the membrane from sub-straight.
Rust/rot of fasteners and decking

Solution Options

Client: Manchester Essex Regional School District

Facility: Essex Elementary

Roof Section: Main Roof Section

Repair Options			
Solution Option:	Repair	**Action Year:**	2021
Square Footage:	48,000	**Expected Life (Years):**	-
Budget:	$5,200.00		

Scope of Work:

Leak Repairs & General Maintenance:

- Troubleshoot & repair **20 failed patches and flashing conditions** on all roof sections.
- Troubleshoot & repair **30 failed patches over edge metal laps** on all roof sections.
- For penetrations and failed coverstrip/flashing:
  - Clean roof surface with high grade cleaner
  - Apply peel and stick Uni-Bond 6" tape to penetration or seam
  - Apply White Knight Plus WC to Uni-Bond tape and extend coating 4" past all seams of tape. Ensure felt backing of tape is fully saturated.
- Apply GreenLock Structural Adh at termination bars.
- All debris will be cleared up and removed.

Asbestos 3-Year Re-inspection Report and Management Plan

Essex Elementary School
12 Story Street
Essex, Massachusetts, 01929

Prepared by:

ATC Group Services, LLC
10 State Street, Suite 100
Woburn, Massachusetts 01801

January 22, 2020

Appendix C

January 22, 2020

To Whom It May Concern,

ATC Group Services LLC was contracted by Manchester Essex Regional School District located in Manchester, Massachusetts to perform the asbestos three-year AHERA re-inspection and provide this updated Management Plan for Essex Elementary School. The asbestos re-inspection and management plan update was performed in compliance with the AHERA Final Rule and Notice.

The enclosed asbestos re-inspection and updated management plan was completed in December of 2019 by Ms. Elizabeth Fuller, Commonwealth of Massachusetts Department of Labor Standards (DLS) certified Asbestos Inspector, and Mr. Ricardo Nunes, a DLS certified Asbestos Management Planner. A copy of the appropriate license and certification follows.

Elizabeth S. Fuller

Elizabeth Fuller
Massachusetts Asbestos Inspector
(AI-054778)

Ricardo Nunes
Massachusetts Asbestos Management Planner
(AP-900470)

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APPENDIX B – HAZARDOUS BUILDING MATERIALS INSPECTION REPORT DATED NOVEMBER 15, 2016

1.0 REVIEW OF EXISTING PAPERWORK/RECORD KEEPING

Response Actions:

Each LEA must keep an updated copy of the management plan in its administrative office for each school under its administrative control or direction. The plan must be available without restriction to the public school personnel and their representatives, parents and representatives of EPA and the State, for inspection during normal business hours.

Section 763.94 (Record-keeping) of the AHERA Final Rule (40 CFR Part 763, Subpart E) requires that the following paperwork be obtained for all abatement activities: copies of all personnel accreditation's and licenses, copy of the company's (Abatement Contractor) license, copies of any required notifications, copies of disposal receipts, and records of the particulars of the job as to activity, location, and personnel used with their signatures, where applicable.

A summary of ATC's record review indicated the following:

Response Actions Completed by In-House Staff:

No information available for review.

Response Actions Completed by Independent Abatement Contractors:

Available upon request.

Six-Month Periodic Surveillance:

No information available for review.

Annual Notifications:

No information available for review.

2019 Response Actions Priority List

All identified ACBM and suspect materials assumed to be ACBM that are not on the Response Actions Priority List should be maintained in accordance with the school's AHERA Management Plan.

The following is estimated resources/cost and schedule for the abatement of high priority items.

Total estimated cost for removal of High Priority Items –

No identified or suspect materials were observed that require a response action.

2.0 AHERA INSPECTION REPORT

AHERA Terms, Abbreviations, and Acronyms

AHERA	Asbestos Hazard Emergency Response Act
Rule	40 CFR Part 763 Subpart E – Asbestos-Containing Materials in Schools Rule, including Appendices A, B, C, and D
Section	Sections 763.80 - 763.99 in the Rule
LEA	The Schools' Local Education Agency (as defined in the Rule)
Plan	The AHERA Management Plan for the School
Part	Subsections of the Plan
EPA	Environmental Protection Agency
OSHA	Occupational Safety and Health Administration
NESHAPS	National Emission Standards for Hazardous Air Pollutants
ACBM	Asbestos-containing Building Material (as defined in the Rule)
ACM	Asbestos-containing Material
Non-ACM	Non-Asbestos-containing Material
S No.	Bulk Sample Number
F	Friable
NF	Non-friable
HA	Homogeneous Area
FS	Functional Space
O&M	Operation and Maintenance Program
MIS	Miscellaneous Building Material (as defined in the Rule)
CT	Ceiling Tile
FT	Floor Tile
FBGL	Fiberglass
TSI	Thermal Systems Insulation (as defined in the Rule)
SURF	Surfacing Materials
HVAC	Heating, Ventilation, Air Conditioning System
N/A	Not Applicable
MA DLS	Massachusetts Department of Labor Standards
	(Formerly DOS – Division of Occupational Safety)

Other relevant terms, abbreviations, and acronyms may be found within regulations included in the Appendices.

Statement of Compliance

AHERA RE-INSPECTION REPORT FOR MANAGEMENT PLAN
ESSEX ELEMENTARY SCHOOL
12 STORY STREET
ESSEX, MASSACHUSETTS

This school was inspected in order to comply with the Asbestos Hazard Emergency Response Act (AHERA), signed into law by President Reagan in 1986. This AHERA Inspection Report is derived from the inspection and classification of asbestos-containing material conducted by an ATC accredited Asbestos Inspector. Suspected asbestos-containing materials have been sampled, analyzed, and assessed in accordance with AHERA regulations.

Asbestos-containing materials were classified according to guidelines in the AHERA regulations. Based on a bulk sample's asbestos content, and the condition, location, and hazard potential of the material that was sampled, ATC's accredited Asbestos Management Planner recommended a response action if deemed necessary or the material should be maintained in good condition in accordance with the existing AHERA Management Plan.

Requirements of the Asbestos Hazard Emergency Response Act, Subpart E (Asbestos-containing Materials in Schools) were complied with for the purpose of this Inspection Report.

The following Consultant Accreditation Page identifies the inspectors and management planners who contributed to the Plan. Also provided are the certificate numbers, signatures, and date of signature of each.

Note: A comprehensive Interior Asbestos Inspection and Sampling Report was completed on October 18, 2016 by ATC Group Services, LLC and is included in Appendix B of this report.

Consultant Accreditation

ATC GROUP SERVICES LLC
Woburn, Massachusetts

1. ACCREDITED ASBESTOS INSPECTOR

Name: Elizabeth Fuller

MA DLS Accreditation Number: AI- 054778 (Exp. Date 08/15/20)

Date: January 22, 2020

Signature: Elizabeth S. Fuller

2. ACCREDITED ASBESTOS MANAGEMENT PLANNER

Name: Ricardo Nunes

MA DLS Accreditation Number: AP (Exp. Date 03/05/20)

Date: January 22, 2020

Signature: Ricardo Nunes

Asbestos Information

1 GENERAL

"Asbestos" is the term used to describe certain fibrous silicate minerals that were formerly widely used for insulating, construction, and other purposes. Asbestos fibers were used throughout the construction industry due to their properties of non-flammability, high tensile strength, and low heat conductance. In the northeast United States, the most commonly encountered types of asbestos are "chrysotile" and "amosite". Other types of asbestos are found in a wide variety of construction materials.

Asbestos poses a health hazard when very small asbestos fibers, approximately five micrometers in length, are released into the air and inhaled into the lungs. Once in the lungs these fibers can either be expelled or become trapped. If they become trapped the body cannot break the fibers down, and the lungs try to encase the foreign material with tissue. This process can cause scarring of the lung tissue that may ultimately result in impaired lung elasticity and subsequent chronic dysfunction. This disease is called asbestosis.

Asbestos diseases may manifest in other forms that are equally dangerous, such as mesothelioma, a form of lung cancer. The latency period of these diseases has been determined by medical professionals to be anywhere between ten and thirty years following exposure. For additional information regarding the health hazards of asbestos, consult Health Hazards of Asbestos, U.S. Department of Labor, Occupational Safety and Health Administration (OSHA 3040), and Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, U.S. Environmental Protection Agency (EPA 560/5-83-002, March 1983). These documents are available from the regional office of the U.S. Environmental Protection Agency, Federal Office Building, 26 Federal Plaza, New York, New York 10007, 212-264-2525.

Asbestos-containing building materials (ACBM) can be categorized into two groups: (1) friable; and (2) non-friable. Friable asbestos-containing material is that which can be crumbled, pulverized, or reduced to dust or powder using hand pressure. The presence of friable ACBM creates the need for the most urgent attention, while the presence of non-friable ACBM should be documented and proper handling procedures established, in order to avoid allowing the material to deteriorate to a friable and hence potentially hazardous condition. Non-friable ACBM, as well as friable ACBM, must be assessed periodically to determine their potential for fiber release. An operation and maintenance program including preventive measures must be established to prevent disturbance of all asbestos-containing materials.

Note: The AHERA Rule differentiates between ACBM and ACM. In the remainder of this report, all asbestos-containing material, including ACBM, will be referred to by the acronym "ACM".

2 AHERA CLASSIFICATIONS

AHERA classifies asbestos-containing materials as thermal system insulation, miscellaneous materials, or surfacing materials.

a. Thermal System Insulation (TSI)

The most common asbestos-containing thermal system insulation (TSI) are the following: aircell, which is an asbestos-containing paper; calcite and magnesia, which are powdery fibrous silicas; and preformed asbestos lagging or blocks. These types of TSI were used for many years as insulation wrapped around pipes, boilers, ducts, and hot water tanks in order to reduce thermal heat loss and prevent condensation.

When asbestos-containing insulation and its outer wrapping are in good condition there is minimal chance that asbestos fibers will become airborne, provided the insulation is not disturbed. Insulation that is intact may remain in place as long as its location and condition are documented, and proper education is provided to individuals who may potentially disturb the insulation, thereby causing a fiber release episode.

If TSI is intact and in good condition, it must be maintained according to an Operations and Maintenance Program in order to monitor its condition, since the physical condition of the insulation may change, thereby increasing the potential for fiber release. If asbestos insulation is frayed, punctured, ripped, water damaged, or vandalized, a fiber release episode may occur. Whenever a fiber release occurs, the insulation should be repaired, encapsulated, enclosed, or removed in order to decrease the potential hazard to both human health and the environment.

b. Miscellaneous Materials

Floor and ceiling tiles are categorized as miscellaneous interior building materials. Of the two, ceiling tiles are the most common friable materials. Ceiling tiles may release asbestos fibers upon the slightest disturbance. Air currents from HVAC systems may also cause erosion of ceiling tiles and subsequent asbestos fiber release. Routine maintenance of pipes located above asbestos-containing ceiling tiles can possibly cause some quantity of fibers to be released due to disturbance of the tiles. Under normal conditions, non-friable miscellaneous ACM has virtually no potential for fiber release. However, if these materials are sanded drilled, broken, or otherwise structurally disturbed they can release fibers to the air and the environment.

c. Surfacing Materials

Acoustical troweled-on-plaster and sprayed-on fireproofing are categorized as surfacing ACM. Fireproofing insulation was applied as a fluffy coating in order to provide two to four-hour fire protection, so that structural beams would not warp and collapse during a fire. Insulation of this type has a high potential to release fibers into the air upon any physical contact or by the action of air currents. Asbestos-containing

plaster was also used for fireproofing and for acoustical purposes. Non-friable surfacing ACM that has a low potential for disturbance also presents a low potential for fiber release.

3 METHODS OF SURVEY CLASSIFICATION AND RESPONSE ACTION DETERMINATION

This school was inspected for ACM by a trained and certified ATC inspector. The inspector assessed the building materials and categorized similar materials into a group called a homogeneous area (HA). The HA are listed by number, with a description of the material and a list of areas that contain the material, which are called functional spaces. Bulk samples of each suspect HA were taken according to Section 763.86 of the Rule. Sample locations are described or noted on the building diagrams.

The inspector recorded the following for each HA: the approximate square or linear footages, activity in the area, risk factors, condition of the ACM, type of damage, if any, and the distribution of damage. These factors were considered when developing the response actions presented in this plan.

These factors, future building uses, and planned renovations all should be taken into consideration when the LEA must choose among the alternative response actions recommended, or otherwise available, for reducing the hazard to human life and the environment posed by the presence of ACM.

4 ASBESTOS TREATMENT METHODS

Three categories of alternative treatments are available to treat or control asbestos-containing materials. Conditions that must be taken into consideration when determining the appropriate method of treatment for ACM are location, quantity, physical condition, future uses, renovation or demolition plans, and any social, political, or economic constraints that may apply. The following are brief descriptions of the three categories of alternative treatments.

a. Repair and Encapsulation

Repair and encapsulation generally offer the least expensive form of treatment. Although this brings the material back to its original and/or non-friable condition, the activity must still be documented in an O&M Program to monitor the future condition of the material and its potential for hazard. This method, however, leaves the ACM in the building where it will continue to age and deteriorate.

b. Enclosure

Enclosure offers a more expensive but more secure solution for some ACM. Building an impermeable case around asbestos-containing pipes or plaster can prevent release of asbestos fibers due to deterioration and physical disturbance. However (as is also true for repair and encapsulation), the NESHAPS legislation requires that if future plans call for renovation, repair, or demolition, the ACM must first be removed. Enclosed ACM must also be included in an O&M Program.

c. Removal

Removal, although initially the most expensive option, is often the most permanent and cost-effective solution. Not only are future potential hazards associated with asbestos-containing materials eliminated, operation and maintenance, repair, and periodic surveillance and inspection (as required with the options described above) become unnecessary. Future problems or costs for asbestos control are thus completely eliminated.

5 RESPONSE ACTION RECOMMENDATION / IMPLEMENTATION

Regardless of the abatement method chosen, it is important to bear in mind that any disturbance of friable asbestos-containing material can cause fibers to be released, if proper procedures and precautions are not observed.

Asbestos abatement workers licensed in Massachusetts must be employed to perform any large-scale operation (one involving greater than three square or three linear feet of asbestos). It is recommended that a Massachusetts DLS certified asbestos project monitor be employed to ensure the safety of employees and building occupants and to ensure that proper work practices and procedures are followed during all phases of an abatement project. Collection of samples to determine ambient air fiber levels upon completion of a project is also required. It is also recommended that ambient air fiber levels be measured before and during a project. These added precautionary measures greatly increase a school's ability to document and record pertinent data and thereby reduce its own potential liability.

6 RISK ASSESSMENT AND ASBESTOS CONTROL

Actual risk due to asbestos exposure cannot be quantitatively defined, nor can the relationship between an exposure and its consequential effect be estimated. The only precise quantitative statement that can be made concerning asbestos is that zero exposure will give zero risk. It is generally agreed, however, that the greater the exposure, the greater the risk.

The above consideration, combined with the fact that over time, any building material will decay and eventually most systems will be replaced by newer, more advanced and efficient systems, is the basis for the recommendation that, whenever possible, all exposed friable asbestos be removed and that any remaining asbestos-containing materials be controlled with an asbestos O&M Program. Recommended control methods are outlined in the Operation and Maintenance Program in Part VII. Appendix B of the Rule should be consulted regularly as a guide for specific work practices to use for jobs that require contact with asbestos in a School. Again, bear in mind that NESHAPS regulations currently in force require the proper removal of ACM before any major renovation, repair, or demolition occurs.

3.0 LOCAL EDUCATION AGENCY (LEA)

LEA Responsibilities

1. All aspects of the inspection and management plan are carried out in accordance with the Rule.

2. Custodial and maintenance staff receives proper training as required by all federal and state regulations.

3. Workers and building occupants or their legal guardians are informed at least once each school year about all asbestos-related activities that are planned or are in progress.

4. Short-term workers who may come in contact with asbestos are informed about the locations of ACM and assumed ACM.

5. Required warning labels are posted in routine maintenance areas according to Section 763.95 of the Rule.

6. Parent, teacher, and employee organizations are notified yearly of the availability of the Plan. The School maintains a copy of the Plan at the School for inspection per Section 763.93(g) of the Rule.

7. Per Section 763.84(g)(1) of the Rule, the LEA shall "Designate a person to ensure that requirements under this section are properly implemented and ensure that the designated person receives adequate training as described in Section 763.84 (g)(2)."

8. "Consider whether any conflict of interest may arise from the interrelationship among accredited personnel and whether that should influence the selection of accredited personnel to perform activities under this Subpart." (Section 763.84(h) of the Rule.)

Confirmation of Designated Person

LEA	Manchester Essex Regional School District
School	Essex Elementary School
Address	12 Story Street, Essex, Massachusetts 01929
Telephone	978-526-2055 x 3155
Designated Person	Mr. Jason Waldron
Title	Facility Manager
Address	36 Lincoln Street Manchester, MA 01944
Telephone	Office: 978-526-2055 x 3115 and Cell 978-500-3163
QUALIFICATIONS	
Training	
Training Facility	
Town, State	
Certificate Number	
Hours of Training	
Date of Course	

ASSURANCE OF RESPONSIBILITIES ASSUMED

As the AHERA Designated Person, I shall assume responsibility to ensure that the LEA's duties are carried out as described in 40 CFR 763, Subpart E.

Date	**Signature of Designated Person**

Recommendation to LEA

There is an increasing number of regulations regarding the handling, removal, transportation, and disposal of asbestos-containing materials. The LEA must be kept informed of and perform all response actions and other asbestos-related activities, in accordance with all federal, state, and local regulations regarding asbestos. In addition to AHERA 40 CFR Part 763 Subpart E, these regulations include, but are not limited to: 453 CMR 6.00 (Massachusetts DLS); 29 CFR 1926.1101 and 29 CFR 1910.134 (OSHA); 40 CFR Part 763, Subpart G (EPA Worker Protection); 40 CFR Part 61, Subpart M (NESHAPS); 310 CMR 7.15 (Massachusetts DEP); 49 CFR Part 100-177 (DOT); and all amendments and mandatory appendices and regulations cited within these regulations.

The regulations are meant to protect the health and safety of those working with and around asbestos, as well as building occupants. Given the LEA's responsibility to protect both human health and the environment of the school building's occupants, and the high potential liability associated with asbestos remediation projects, the LEA **MUST ENSURE** that the interests of the building's occupants are protected.

All response actions other than small-scale, short duration activities must be designed and conducted by persons accredited and licensed to conduct such activities. Design specifications should be sufficiently explicit to avoid conflicts or confusion that may arise concerning the scope of work and required procedures. It is recommended that the LEA contract a Massachusetts certified and licensed Asbestos Abatement Project Monitor to help ensure that projects are carried out safely, thoroughly, and in compliance with all applicable laws and regulations. Areas adjacent to the project should be sufficiently monitored throughout the project to provide clear documentation of project integrity. Final inspection and air clearance must be achieved as required in Section 763.90(i) of the Rule before any response action may be considered successfully completed.

The LEA must consider any conflict of interest that may potentially arise when retaining accredited designers and contractors to perform asbestos-related activities. Generally it is recommended that the LEA choose separate accredited entities: one for project design (including project oversight, clearance visual inspection, and air monitoring); and another to conduct the asbestos project according to the design. Appendix A of the Rule states that ". . . air sampling operations must be performed by qualified individuals completely independent of the abatement contractor".

4.0 PUBLIC NOTIFICATION

Occupant Notification

In accordance with Section 763.84(c) of the Rule, the LEA will notify in writing, at least once yearly, all relevant occupants of the school of all asbestos-related activities that take place at the school. Relevant occupants include, but are not limited to: building occupants or their legal guardians; staff, including teaching, administrative, custodial, maintenance, and all other personnel; all parent, teacher, employee, and administrative organizations; and/or any similar organizations at the school which serve similar functions.

Asbestos activities include, but are not limited to: inspections; response actions, including removal, encapsulation, enclosure, repair, and operation and maintenance; and post-response action activities, including periodic surveillance and re-inspection. In addition, Section 763.93(g)(4) of the Rule requires the LEA to inform occupants at least once per year that the AHERA Management Plan exists and is available for review in the school's Administration Office.

In accordance with the aforementioned Sections and Section 763.93(b) of the Rule, the LEA must maintain a dated copy of all such notifications. The list of relevant groups to be notified will be added to and updated as necessary and should also be kept on file.

Plan for Notification

In accordance with Sections 763.84(c) and Sections 763.93(e)(10) and (g)(4) of the Rule, all school building occupants will be informed by written notification about all asbestos-related activities at least once every school year.

Building occupants to be notified include, but are not limited to, all students or their legal guardians, and all staff members and their committees, representatives, and organizations.

As of December 2019, building occupants at the school include the following:

- Students
- Legal guardians of students
- Staff (including teaching, custodian, maintenance, Administrative, and all other personnel)

The LEA may choose various methods of notification to building occupants. The method of notification, such as written notification via posted notices at the school, or through publications such as a legal notice in the local newspaper, must be documented and details of the new notification methods used must be included in the Management Plan. Copies of the annual public notice must be included in the Management Plan.

Training Requirements

In accordance with Section 763.92(a) of the Rule, all school building custodial and maintenance personnel shall receive awareness training of at least two (2) hours, whether or not they are required to work with asbestos. All newly hired persons shall receive training which meets the requirements of this section within sixty (60) days of hire.

ACBM Locations

According to Section 763.84(d) of the Rule, the LEA must ensure that all short-term workers who may come in contact with asbestos in the school (e.g., telephone, plumbing, HVAC, electrical workers, etc.) are provided information regarding the locations of identified or assumed ACM. In addition, as required by Section 763.92(a)(i)(iii), all members of the school's maintenance and custodial staff must be informed of the locations of ACM identified throughout each school building in which they work.

Asbestos Activities

Prior to the start of asbestos abatement and/or associated or remediation projects, proper notifications must be made by the appropriate entities to all applicable federal, state, and local agencies and authorities. The local Health and Fire Departments are often good places to begin researching local regulations and notification requirements. Notifications may include but are not limited to the following.

1. NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

NESHAPS requires notification whenever asbestos is being removed according to the quantities involved, as follows:

a. Demolition

10 days' notice for any asbestos abatement project. Notification must include friable and potentially friable ACBM.

b. Renovation

10 days' notice for any asbestos abatement project. Notification must include friable and potentially friable ACBM.

NESHAPS notifications are submitted to the EPA Region I Office per 40 CFR Part 61, Subpart M.

2. MASSACHUSETTS DEPARTMENT OF LABOR STANDARDS (DLS)

The Massachusetts Department of Labor Standards (DLS) must be given proper notice when any asbestos abatement project or asbestos associated project involving more than three linear or three square feet is planned. The Commissioner of the DLS must be notified at least ten days prior to the project start date (postmark or hand delivery), or in the case of an emergency, within one working day after the project start date (DLS 453 CMR 6.00).

3. MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)

The Massachusetts DEP requires proper notification and ten days prior notice (one day prior notice in the event of emergency) before the start date of **any and all** asbestos removal projects (310 CMR 6.00, 7.00, and/or 8.00).

*Contact the agencies denoted above or refer to the appropriate regulations for further information requiring proper notification procedures and guidelines.

5.0 ASBESTOS-CONTAINING MATERIALS RESPONSE ACTIONS

Response Action Determination Summary

Response Action Determinations were made by using the EPA recommended method to determine the risk to human health associated with exposure to asbestos within a given ACM category. Appropriate response actions that are consistent with applicable regulations and protect human health and the environment are then recommended in order to best respond to and/or control ACM.

Response Action Descriptions

The following is a brief and general description of the Response Actions recommended in the Plan. The following response actions may only be undertaken in accordance with all applicable federal, state, and local regulations governing the handling and disposal of asbestos. Procedural requirements and work practices regarding small-scale, short-duration asbestos activities may be

found in the O&M Section of this Plan. Refer to the Table at the end of Part V for a complete list of ACMB and recommended response actions.

1. Removal

Removal means the complete removal and disposal of designated asbestos-containing material of any kind. If ACM debris is present, the area must be isolated and the debris cleaned up immediately.

2. Repair

Repair means to restore a damaged area to its original intact condition. This includes making the damaged area airtight to prevent the release of fibers into the air. If ACM debris is present, the area must be isolated and the debris cleaned up immediately. Place all repaired ACM in the O&M Program.

3. Encapsulation

Encapsulation means the application of a material with a bonding or sealing property to prevent the release of airborne fibers. If ACM debris is present, the area must be isolated and the debris cleaned up immediately. Place encapsulated ACM in the O&M Program.

4. Enclosure

Enclosure means creating an airtight structure around an affected area to prevent the release of airborne fibers and significantly reduce the possibility of future physical disturbance or damage to the ACM. Any damaged ACM must be repaired prior to enclosure. If ACM debris is present the area must be isolated and the debris cleaned up immediately. Place the enclosed area in the O&M Program.

5. Operation & Maintenance (O&M) Program

An O&M program describes a structured plan of action to maintain ACM in a condition that protects the health and safety of the occupants in a building and provides for remedial action in the event that ACM is disturbed.

AHERA Material/Condition Assessment Key for Functional Spaces As found in the School Report

1. Damaged or significantly damaged TSI.
2. Damaged friable surfacing material.
3. Significantly damaged friable surfacing material.
4. Damaged or significantly damaged friable miscellaneous material.
5. ACM with potential for damage.
6. ACM with potential for significant damage.
7. Any remaining friable known or suspect ACM.

8. Damaged or significantly damaged non-friable ACMB. Note that this category is not listed in the AHERA regulations but is provided for reference in this report.

Method of Response Action Determination for Surfacing and Miscellaneous ACM

1. Friable Surfacing or Miscellaneous ACM with Significant Damage

Response Action 1: Remove

Isolate the area and clean up debris immediately. Remove ACM as soon as possible.

2. Friable Surfacing or Miscellaneous ACM with Damage and High Potential for Disturbance

Response Action 1: Remove

Isolate area and clean up immediately. Remove ACM as soon as possible.

3. Friable Surfacing or Miscellaneous ACM with Damage and Moderate Potential for Disturbance

Response Action 4: Enclose

Institute preventive measures. Repair ACM to return to airtight, intact condition, and enclose with an impermeable encasement to prevent physical disturbance. Continue with O&M.

4. Friable Surfacing or Miscellaneous ACM with Damage and Low Potential for Disturbance

Response Action 3: Encapsulate

Institute preventive measures. Repair damaged material to return to intact condition and encapsulate to reduce the possibility of fiber release. Continue with O&M.

5. Friable Surfacing or Miscellaneous ACM with No Damage and High Potential for Damage

Response Action 4: Enclose

Institute preventive measures. Enclose material to reduce effects of future disturbance. Continue with O&M.

6. Friable Surfacing or Miscellaneous ACM with No Damage and Moderate Potential for Damage

Response Action 3: Encapsulate

Institute preventive measures. Encapsulate material to reduce the possibility of fiber release. Continue with O&M.

7. Friable Surfacing or Miscellaneous ACM with No Damage and Low or no Potential for Damage

Response Action 5: O&M Program

Continue with O&M until condition factors change, requiring additional response.

8. Non-Friable Surfacing or Miscellaneous ACM

Response Action 5: O&M Program

Continue with O&M until condition factors change, requiring additional response.

Method of Response Action Determination for Thermal System Insulation (TSI) ACM

1. Significantly Damaged Thermal System Insulation (TSI)

Response Action 1: Remove - Isolate the area and restrict access. ACM debris should be removed and the area cleaned up immediately.

2. Damaged Thermal System Insulation with High Potential for Disturbance

Response Action 1: Remove - Institute preventive measures and remove material as soon as possible.

3. Damaged Thermal System Insulation with Moderate Potential for Disturbance

Response Action 4: Enclosure - Institute preventive measures. Repair insulation to airtight condition and enclose with an impermeable encasement to protect against further physical damage. Continue with O&M.

4. Damaged Thermal System Insulation with Low Potential for Disturbance

Response Action 2: Repair - Repair to airtight condition and take preventive measures necessary to eliminate any potential disturbance. Continue with O&M.

5. Undamaged Thermal System Insulation with High Potential for Disturbance

Response Action 1: Remove - Institute preventive measures. Remove to prevent the high possibility of disturbance to the ACM.

6. Undamaged Thermal System Insulation with Moderate Potential for Disturbance

Response Action 4: Enclose - Institute preventive measures. Enclose the ACM within an airtight barrier to prevent potential disturbance of ACM. Continue with O&M.

7. Undamaged Thermal System Insulation with Low or No Potential for Disturbance

Response Action 5: O&M - Continue with O&M.

Summary Table of ACBM

Essex Elementary School
Essex, Massachusetts
December 23, 2019

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Principal's Office	12" x 12" Brown Floor Tile	300 SF	150 SF	Non-Friable	5	Under Carpeting	Maintain the material in good condition in accordance with the O&M Plan
Secretary's Office	12" x 12" Brown Floor Tile	300 SF	150 SF	Non-Friable	5	Under Carpeting	Maintain the material in good condition in accordance with the O&M Plan
Guidance Office (ELL)	9" x 9" Floor Tile	550 SF	470 SF	Non-Friable	6	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Student Support Room	9" x 9" Floor Tile	550 SF	470 SF	Non-Friable	6	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 18	Joint Compound and Associated Gypsum Wall Board	Not Identified	1,000 SF	Friable	6	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 19	Joint Compound and Associated Gypsum Wall Board	Not Identified	1,000 SF	Friable	6	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Kitchen Storage Room	12" Pipe Insulation	20 LF	20 LF	Friable	6	Good Condition/Damaged ACBM Repaired	ACM debris is cleaned up and the damaged pipe insulation is repaired. No records were available of this work. LEA should include details of this response action in records, per AHERA requirements.
Older Section of School, Hallway	Purple Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Older Section of School, Classroom # 19	Purple Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 1	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 2	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 3	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 4	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
1st Floor - Classroom # 5	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 6	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 7	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 8	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 9	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 11	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 13	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 14	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
1st Floor - Classroom # 15	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Classroom # 16	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Basement Floor Rec Room	Black Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 18	Gray Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 20	Gray Sink Sealant	Not Identified	1 Sink	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor - Exit Door #1	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Basement - Exit Door # 6 (Art Room)	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
1st Floor - Exit Door # 9 (Gymnasium)	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor – Classroom # 7	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor – Classroom # 8	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor – Classroom # 15	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor – Classroom # 16	Interior Door Frame Caulking	Not Identified	17 LF on 1 Door Frame	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Basement Floor – Boiler Room	Fire Door	1 Door (Assumed)	1 Door (Assumed)	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
1st Floor – Old Section Hallways	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	3,500 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 1	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 2	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 3	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Classroom # 4	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 5	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 6	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 7	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 8	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Classroom # 9	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 10	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 11	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 12A	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	350 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 12B	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	350 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Classroom # 13	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 14	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 15	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 16	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 17	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Classroom # 18	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 19	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 20	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Classroom # 30	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Nurses Office	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	700 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Psych Office/Special Education	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	400 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Book Room	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	200 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Student Support Room	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	400 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Library	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	2,000 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Foreign Language Room (#29)	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	150 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Location	Material	Quantity Reported in 2013 AHERA Inspection	Quantity Observed in 2019 3-Year Re-inspection	Friable / Non-Friable	Material/ Condition Assessment Code	Comments	Response Action Recommendation
Counselor's Room	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	300 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Library Office	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	200 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Gym Office	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	100 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan
Speech Room (#30)	Black Mastic and Associated Non-ACM Floor Tile	Not Identified	200 SF	Non-Friable	5	Good Condition	Maintain the material in good condition in accordance with the O&M Plan

Material Condition/Assessment Code Definitions: According to the AHERA Regulation, 763.88 Assessment, the following categories are provided to assess the ACBM, suspected ACBM or assumed ACBM in the school building: (1) damaged or significantly damaged TSI, (2) damaged friable surfacing material, (3) significantly damaged friable surfacing material, (4) damaged or significantly damaged friable miscellaneous material, (5) ACBM with potential for damage, (6) ACBM with potential for significant damage, (7) any remaining friable known or suspect ACBM, or (8) damaged or significantly damaged non-friable ACBM (note that this category is not listed in the AHERA regulations but is provided for reference in this report.)

6.0 RESPONSE ACTION DETERMINATION SUMMARY

Introduction

In compliance with the AHERA Rule, the LEA must establish and implement an Operation & Maintenance (O&M) and Repair Program for each school that contains ACM. The purpose of an O & M program and its required periodic surveillance and re-inspection is to monitor and control the condition and location of any remaining ACM in the school and to reassess the potential for hazard to human health and the environment which it poses. The following summary of Section 763.91 of the Rule highlights the LEA's responsibilities with respect to O & M for all ACM that remains in the school.

LEA Responsibilities

1. Establish and implement an Operation & Maintenance (O & M) and repair program for all material identified or assumed to be ACM, including both friable ACM and non-friable ACM with the potential to become friable due to activities performed.

2. Implement the initial cleaning of any areas containing friable ACM or assumed friable ACM that is present after the inspection has been completed and before response actions other than O & M takes place.

   Cleaning techniques [taken directly from Section 763.91(c)(1) of the Rule] include but are not limited to:

   a. HEPA-vacuum or steam-clean all carpets.

   b. HEPA-vacuum or wet-clean all other floors and all other horizontal surfaces.

   c. Dispose of all debris, filters, mop heads, and cloths in sealed, leak-tight containers.

3. Initiate any additional cleaning recommended in the Plan.

4. Implement the following procedural techniques (taken directly from Section 763.91(d) of the Rule) for all O & M activities that involve the disturbance of friable ACM:

   a. Restrict entry into the area by persons other than those necessary to perform the maintenance project, either by physically isolating the area or by scheduling.

   b. Post signs to prevent entry by unauthorized persons.

   c. Shut off or temporarily modify the air handling system and restrict other sources of air movement.

   d. Use work practices or other controls, such as wet methods, protective clothing, HEPA vacuums, mini-enclosures, and glovebags, as necessary to inhibit the dispersal of released fibers.

e. Clean all fixtures or other components in the immediate work area.

f. Place asbestos debris and contaminated cleaning materials in a sealed, leak-tight container.

5. Make certain that all response actions involving more than three linear or square feet of ACM will be designed by a Massachusetts accredited designer, and performed by Massachusetts accredited contractors and consultants. The Commonwealth of Massachusetts requires that proper notifications be made as necessary to the Department of Labor Standards (DLS), the Department of Environmental Protection (DEP), and/or the U.S. EPA (per NESHAPS).

6. Ensure that the following procedures (from Section 763.91(f)(1) of the Rule) are adhered to in the event of a minor fiber release episode or the falling or dislodging of three linear or square feet or less of friable ACM:

   a. Thoroughly saturate the debris using wet methods.

   b. Clean the area as described in Section 763.91(c) of the Rule.

   c. Place the asbestos debris in a sealed, leak-tight container.

   d. Repair the area of damaged ACM with materials such as asbestos-free spackling, plaster, cement, or insulation, or seal with latex paint or other encapsulant, or immediately have the appropriate response action implemented as required by Section 763.90 of the Rule.

7. Make certain that the following procedures (taken directly from Section 763.91(f)(2) of the Rule) are adhered to in the event of a major fiber release episode or the falling or dislodging of more than three linear or square feet of friable ACM:

   a. Restrict entry into the area and post signs to prevent entry by persons other than those necessary to perform the response action.

   b. Shut off or temporarily modify the air-handling system to prevent the distribution of fibers to other areas in the building.

   c. The response action for any major fiber release episode must be designed by persons accredited to conduct response actions.

8. Post warning labels immediately adjacent to all ACM or assumed ACM located in routine maintenance areas as described in Section 763.95 of the Rule.

9. Make certain the designated person and custodial and maintenance staff are properly trained in accordance with the Rule and all other applicable federal, state, and local regulations. Staff members who may disturb ACM must receive sixteen hours of training. Members of the building's maintenance or engineering staff or outside contractors (plumbers, electricians, installers, etc.) who may be required to handle or disturb ACM are required by the Massachusetts DLS to be trained by a state-certified training provider regarding proper handling procedures for asbestos.

10. Once the Plan is in effect, the LEA must implement periodic surveillance of all remaining ACM in the facility for changing condition and hazard assessment every six months after the Plan is in effect. Staff members who have completed the aforementioned sixteen-hour training can perform this.

11. Make certain that re-inspection of all remaining ACM is conducted by an accredited asbestos inspector every three years while ACM remains in the school in accordance with Section 763.85(b) of the Rule.

12. Make certain that all short-term workers (generally outside contractors) are provided with information regarding the locations of ACM and assumed ACM, per Section 763.84(d) of the Rule.

Training Requirements and Worker Protection

In compliance with Section 763.92(a) of the Rule, all maintenance and custodial staff must receive at least two hours of asbestos awareness training prior to the implementation of the O & M Program described in this Plan. Essex elementary school maintenance personnel training certificates are attached in Section 10.0.

New staff personnel must similarly be trained within sixty days of commencement of employment. In addition, personnel who will conduct activities that may result in the disturbance of ACM must receive an additional fourteen hours of training, as required by the Rule.

As described in Section 763.92(a) of the Rule, awareness training must include information regarding: the forms and uses of asbestos; the health effects associated with asbestos exposure; the locations of ACM identified throughout the school; how to recognize damage, deterioration, and delamination of ACM; the name and telephone number of the person designated by the LEA; and the availability and location of the Plan.

As described in Section 763.91(b) of the Rule, all LEA employees who perform O & M and repair activities involving ACM and who are not covered by OSHA 29 CFR 1926.1101, or are approved by Section 19 of the Occupational Safety and Health Act, are extended worker protection provided by the EPA at 40 CFR 763.121. According to the EPA's "AHERA Fact Sheet", the LEA may choose to institute the provisions of Appendix B of the Rule in the case of small-scale, short-duration projects rather than comply with the full EPA Worker Protection Rule.

Periodic Surveillance & Re- Inspection

The LEA must conduct a periodic surveillance in each building every six months after the Plan is in effect. An assigned person trained in accordance with Section 763.92(a) of the Rule shall visually inspect all areas that are identified in the Plan as ACM or assumed ACM, record the date of the surveillance, his or her name, any changes in the condition of the materials, and submit to the Designated Person a copy of such record to be included in the Plan, in accordance with Section 763.92(b) of the Rule.

At least once every three years after the plan is in effect, the school must conduct a re-inspection of all friable and non-friable, assumed and identified ACM. The re-inspection must be conducted by a Massachusetts accredited inspector and performed in accordance with Section 763.85(b) of the Rule.

Once the Plan has been approved by the Governor's Designee, the Plan is considered to be "in effect", so that the first periodic surveillance will have to occur before the expiration of six months from the "effective date." Likewise, the first re-inspection will have to take place within three years of the effective date.

It is recommended that the effective date and appropriate periodic surveillance and re-inspection dates be entered into the Plan in tabular form and also be posted to serve as a frequent schedule reminder.

Warning Signs

In accordance with Section 763.95 of the Rule, the LEA is responsible to prominently place warning signs immediately adjacent to all identified or assumed, friable and non-friable ACM that is located in all routine maintenance areas in the School.

The warning signs must be readily visible and easy to read, with large print and bright color (normally black print on bright yellow background), and read as follows:

CAUTION:
ASBESTOS. HAZARDOUS.
DO NOT DISTURB WITHOUT PROPER
TRAINING AND EQUIPMENT.

The routine maintenance areas for the building covered by this Plan presently include, but are not limited to:

- All Boiler Room spaces
- All Mechanical Room spaces

Preventive Measures

Preventive measures include any action or actions taken in order to eliminate or reduce the possibility of disturbing ACM. All preventive measures taken must be properly recorded according to Section 763.94(b) of the Rule. Examples of precautions to take include the following:

1. Do not cut, sand, drill, break, nail into, or otherwise disturb ACM or create dust.

2. Avoid contact damage to any ACM. Remove any adjacent items that may contact ACM.

3. Keep suspended ceiling tiles in place wherever any ACM exists above them. Do not remove or displace ceiling tiles without taking the proper precautionary measures outlined in 'ACM Above Ceilings', in Part VII below.

4. Do not hang fixtures, wires, etc. from ACM.

5. Prevent water damage to ACM.

6. Do not disturb asbestos-containing materials when replacing lights, etc.

7. Do not allow doors or dividers to rub against ACM.

8. Isolate, redirect, or eliminate direct airflow onto any friable or damaged ACM.

Note: Always take proper precautions when working around ACM. Report any damaged ACM to the Designated Person **IMMEDIATELY**.

Cleaning

1. INITIAL CLEANING

Areas of the school where identified and assumed friable ACM and damaged or significantly damaged Thermal System Insulation ACM are present are required according to Section

763.91(c)(1) of the Rule to be cleaned at least once after the completion of the inspection and before the initiation of any response actions other than O & M.

2. ADDITIONAL CLEANING

In addition to initial cleaning and that which is required after any fiber release episode, the LEA is required to perform additional cleaning according to Section 763.91(c)(2) of the Rule. According to Section 763.91(c)(1) of the Rule, additional cleaning recommendations include, but are not limited to, cleaning all proximate surfaces of the areas previously identified:

a. Areas containing ACM where a suspect film or dust occurs.

b. Anytime any friable or non-friable ACM becomes damaged or significantly damaged.

c. Anytime the LEA's Designated Person determines cleaning is necessary to protect the health and environment of the building occupants.

It is important that all cleaning be completed prior to the initiation of other response actions that may be necessary. The initial cleaning will prevent or greatly reduce the possibility of further contamination within an affected area as well as surrounding areas, and reduce the possibility of exposure to school workers and all other building occupants.

Custodial and Maintenance Procedures:

Personnel conducting custodial or maintenance work shall take extreme care not to disturb or damage ACM. If damage occurs or is discovered the Report of Damaged Asbestos Containing Material (Appendix D) should be completed and sent to the Asbestos Program Manager.

1. Resilient Flooring Maintenance:

All vinyl and asphalt-based flooring materials (e.g., tiles, sheet flooring) shall be maintained in accordance with these instructions unless the Asbestos Program Manager demonstrates that the flooring does not contain asbestos. The following work practices apply to the handling of asbestos flooring material:

- Sanding of asbestos flooring material is prohibited.
- Stripping of finishes shall be conducted using *low abrasion* pads at machine speeds less than 300 revolutions per minute (rpm) and using wet methods.
- Burnishing or dry buffing may only be performed on asbestos flooring that has sufficient finish so that the pad cannot contact the asbestos flooring material.

  Low speed spray buffing is strongly recommended over the high speed burnishing process. Burnishing has a very strong potential to disturb or release asbestos fibers for reasons beyond the control of the machine operator. Uneven floor surfaces and insufficient thickness of floor finish can cause fiber releases in potentially high concentrations.

2. Dry or Spray Buffing of Resilient Flooring

Do not buff damaged flooring. Any loose or damaged flooring should be repaired or replaced before buffing is started. This procedure assumes that the floor has adequate coats of polish, and that the

flooring itself will not be damaged or contacted by the buffing equipment. If any flooring damage occurs during buffing, stop work and notify DOE or the Asbestos Program Manager.

- Using scraper and water, remove all foreign matter from the finished surface (gum, tar, stickers, etc.).
- Spot or damp mop to remove stains and spills. Mix chemical cleaner or restorer with water and apply according to manufacturer's recommendations. Spot or damp mop to remove stains and spills. If dry buffing will be performed, apply restorer chemical as required.
- Allow floor to dry thoroughly.
- Spray or dry buff as appropriate:
- To spray-buff, spray small area with spray-buff solution and buff using manufacturer's recommended pad or brush at recommended RPM. Repeat procedure until entire area is spray-buffed.
- To dry buff, buff or dry burnish with manufacturer's recommended pad or brush at recommended RPM.

3. Cleaning/Polishing of Resilient Flooring

Do not polish loose or damaged resilient flooring. Any damage should be repaired before cleaning begins using the applicable work practice(s). Stop work if any damage occurs and notify the Asbestos Program Manager.

- Mix scrubbing chemical with water as recommended by manufacturer and apply liberal amount (do not flood) using mop. Allow to soak for amount of time recommended by manufacturer. Keep floor adequately wet by reapplying cleaning solution if drying occurs. Work small areas at a time.
- Using floor scrubbing machine, manufacturer's recommended pads and operating speed, clean floor to remove embedded dirt and surface marks.
- Remove spent scrubbing solution with wet vacuum or mop.
- Rinse area using clean mop and clean rinse water. Remove water with wet vacuum or mop. Damp mop area to clean up any remaining water or streaks.

4. Stripping of Floor Wax from Resilient Flooring

Do not strip damaged flooring. Any loose or damaged flooring should be repaired or replaced before stripping is started. Wet stripping, if performed properly, should not cause damage to resilient flooring. If any flooring damage occurs during stripping, stop work and notify DOE or the Asbestos Program Manager. Do not dry strip, scrape, sand, or grind resilient asbestos flooring to remove any blemishes or imperfections.

- After proper mixing of stripping chemical, adequately wet floor by mop applying liberal amounts of the solution. Allow chemical to soak for amount of time recommended by manufacturer. If areas become dry, reapply solution to keep floor adequately wet.
- After wax or finish has softened, strip flooring using least abrasive pad and low speed setting (300 RPM maximum). Keep floor adequately wet during machine operation. Do not overstrip. Stop stripping when the old wax or finish is removed. Work small areas at a time.
- Remove dirty stripping solution with wet vacuum or "strip" mop.
- With "rinse" mop, apply liberal amount of clean water to area stripped and remove water with wet vacuum or mop. Repeat rinse procedures.
- If some spots of wax or finish remain, re-strip those areas.

- When applying new wax or finish, do so according to manufacturer's recommendations.

ACM Waste

Waste generated from asbestos projects must be properly stored and disposed. A minimum of a half-face negative pressure respirator and disposable clothing, with a hood and booties, are required when handling asbestos-containing materials. The following procedures must be implemented when handling asbestos-containing waste:

1. All waste must be placed in either sealed barrels or two six-mil polyethylene disposal bags. All waste containers must have two labels as required by both OSHA and the U.S. Department of Transportation (DOT). The labels are worded as follows:

OSHA Label:

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

DOT Label:

RQ HAZARDOUS
SUBSTANCE,
SOLID, NOS
ORM-E, NA 9188
(ASBESTOS)

2. Waste must be adequately wet. Once the debris is in the barrel or disposal bag, sufficient water must be added so that there is a noticeable amount.

3. Disposal bags must be sealed to reduce airspace and make them leak-tight. Twisting and sealing with duct tape is one method to prevent leaks at the opening of the bag. All waste must be double-bagged and sealed. In the case of a glovebag, the use of one labeled bag around the glovebag is considered double-bagging. If the second bag is used to dispose of other contaminated waste and water, a third labeled bag must then be properly sealed around both.

4. Place the bags into a drum or other rigid container equipped with secure or locking ring lids and label with the same information described above.

5. The drums or container must be secured in a temporary storage area previously identified at your facility. This should be an area with limited access and preferably with a locked entry door.

6. Record the date and amount of waste placed in the temporary storage area. A log sheet should be established for this purpose.

7. Keep the temporary storage area clean by using good work practices. If any bags of waste break, clean the area using the 'Asbestos Debris Cleanup Procedures' in Part VII, and in compliance with all applicable regulations.

8. Before the temporary storage area is full or the expiration of the maximum allowable storage date, make arrangements to have the asbestos waste picked up and delivered to an approved asbestos waste disposal site.

9. Make advance arrangements with the waste disposal facility to ensure that your waste will be accepted.

10. Arrange to have the asbestos waste delivered safely to the previously identified disposal facility.

11. Receipts from both the transporter and landfill for each shipment of waste must be kept on file. Record all dates, destinations, and responsible persons involved in transporting the waste from the temporary storage area to the disposal facility previously identified in the Plan. For further information concerning storage, transportation, and disposal of asbestos-containing waste, contact the Massachusetts DEP.

7.0 SAFE WORK PRACTICES & PROCEDURES FOR ASBESTOS-CONTAINING MATERIALS

Introduction

The following safe work practices and procedures are minimum requirements and/or recommended guidelines for working with or around asbestos-containing materials. School personnel may perform Work involving three linear or square feet or less of ACM and small-scale or short-duration projects provided that they have received the required sixteen-hour asbestos O&M training.

All school employees who perform small-scale or short-duration projects must be provided with appropriate personal protective equipment. This equipment includes, at a minimum, half-face negative-pressure respirators equipped with High Efficiency Particulate Air (HEPA) filters and full-body Tyvek disposable coveralls or their equivalent. The following procedures are to be performed only after first donning this minimum personal protective equipment.

Activities which will disturb greater than three linear or three square feet of ACM must be designed and performed by persons or companies licensed in Massachusetts to perform such activities. All asbestos activities must be performed in compliance with all applicable federal, state, and local regulations. Notifications to appropriate agencies are necessary. Isolation of the affected area is usually required. All asbestos work must also be performed in such a manner as to minimize the release of asbestos fibers and protect the health and environment of all building occupants.

Equipment

In addition to protective equipment such as disposable clothing and respirators, the following equipment may be necessary to perform work involving asbestos.

1. DUCT TAPE

Heavy-gauge tape used to seal glove-bags and secure adjacent sheets of polyethylene.

2. POLYETHYLENE OR PLASTIC SHEETING

Plastic sheeting (6 - mil thick) used to seal off an area in which an asbestos project is taking place in order to prevent contamination of other areas. Also used to seal waste.

3. SURFACTANT

A chemical wetting agent added to water that improves the ability of water to penetrate asbestos-containing material.

4. DISPOSAL BAGS

Six-mil-thick bags used to dispose of asbestos-containing materials. All bags must be properly labeled according to OSHA and DOT regulations.

5. RETRACTABLE UTILITY KNIFE

Used to cut asbestos-containing materials or equipment during removal. Always use **retractable** utility knives so as not to risk puncturing glove-bags.

6. GLOVE-BAG

A pre-manufactured polyethylene bag generally used as a containment around asbestos-containing insulation on pipes or valves so that the insulation may be removed without releasing asbestos fibers into the ambient air. The glove-bag consists of a 6- to 12-mil-thick polyethylene bag fitted with long-sleeve gloves, a tool pouch and an opening for a HEPA vacuum hose and garden sprayer wand. The size, quality, style, and cost vary depending on the manufacturer.

7. WARNING SIGNS

Warning signs are posted at the entrance to the work area and at a sufficient distance so as to allow all building occupants adequate forewarning of the occurrence of an asbestos associated project. The purpose of warning signs is to keep unauthorized personnel away from the work area. The OSHA warning sign is worded as follows:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED IN THIS AREA

8. HEPA VACUUM CLEANER

A High Efficiency Particulate Air (HEPA) filtered vacuum cleaner capable of trapping and retaining 99.97% of all particles larger than 0.3 microns. The HEPA vacuum cleaner is equipped with an extensive filtering system consisting of primary, secondary, and HEPA filters which trap fine particles.

9. RE-WETTABLE FIBERGLASS CLOTH

A canvas-like material impregnated with glue. The cloth is saturated with water and molded over asbestos-containing pipe and boiler insulation, and hardens as it dries. When completely dry, it is sealed with latex paint. Because the cloth contains fiberglass, it is best to wear gloves when handling this material.

10. GARDEN SPRAYER

A garden sprayer is filled with amended water and is used to wet asbestos-containing material or to lock down fibers remaining on substrate from which asbestos-containing material has been removed. When performing the glove-bag technique, a garden sprayer with a 2-3 gallon capacity is sufficient. It is best to have a hose at least six feet long. If the hose is not sufficiently long, it can be replaced or extended with flexible tubing.

11. ENCAPSULANT

A substance applied to asbestos-containing materials that controls the release of asbestos fibers. Encapsulant is applied over re-wettable fiberglass cloth, after the cloth has dried. Latex paint is suitable for this purpose. Be sure the encapsulant chosen has a fire rating appropriate to the area where it is used.

12. SPRAY BOTTLE

A spray bottle filled with water is used to wet any suspect debris.

13. SMOKE TUBES AND ASPIRATOR BULB

Used to test glove-bags for leaks and for respirator fit-testing.

14. RE-SEALABLE STORAGE BAGS

If repairs to pipe insulation are completed using the glove-bag technique, the patching material (i.e., re-wettable fiberglass cloth) must remain free of asbestos contamination. Placing the material inside a storage bag will prevent contamination.

15. RAGS, NYLON BRISTLE SCRUB BRUSHES (OR SCRUB PADS)

These items are used to clean the surface of a pipe or valve once asbestos-containing insulation has been removed. The scrub brush or pad are particularly useful when removing debris from threading. These items cannot be decontaminated and must be discarded as asbestos waste.

16. PATCHING COMPOUND (OR CEMENT)

Used to fill in cracks or holes in pipe or boiler insulation.

17. STAPLE GUN AND STAPLES

Used to temporarily secure polyethylene sheeting and glove-bags.

18. BUCKET

Preferably plastic and washable. Do not use wooden buckets. Used to catch asbestos debris and to wash equipment following use.

Pipe Insulation Repair

With the exception of the one run of pipe insulation in the kitchen storeroom it is the opinion of ATC that no remaining accessible pipe insulation, pipe fitting insulation, boiler insulation or other forms of thermal system insulation are present at Essex Elementary School. If needed, pipe insulation often can be easily repaired using

a patching compound and re-wettable fiberglass cloth. Follow all applicable regulations, including Massachusetts DLS 453 CMR 6.14(3) and (4), and proceed as follows.

1. Isolate and seal off the work area, as required in 453 CMR 6.14. If the repair is to pipe insulation, a glove-bag may be used instead.

2. Seal a piece of six-mil polyethylene sheeting to the floor in the immediate work area, using duct tape. If floor debris is present, first vacuum all visible debris using a HEPA vacuum.

3. Thoroughly wet damaged area with a light mist of amended water, using a spray bottle.

4. Remove any loose debris on the damaged insulation using the HEPA vacuum.

5. Prepare patching compound according to the manufacturer's instructions. Patch the hole or crack.

6. Wet a piece of re-wettable fiberglass cloth thoroughly and place over damaged area. Cover all exposed insulation.

7. Properly clean and carefully peel the polyethylene sheeting off the floor, rolling the sheet so that the contaminated side is inward. Place the sheet into a six-mil polyethylene disposal bag.

8. Place all cleanable tools in a re-sealable storage bag and take the bag to a sink to clean the tools.

9. Remove disposable suit and place in asbestos disposal bag. Double-bag all waste and dispose according to all applicable regulations.

10. Remove, clean, and store respirator.

11. When the re-wettable fiberglass cloth has dried, paint with latex (which has an appropriate fire rating), to ensure airtight seal.

Asbestos-Containing Ceiling Tiles

In this ATC 2019 AHERA re-inspection report it is estimated by ATC that no asbestos-containing ceiling tiles remain at Essex Elementary School.

Asbestos-containing ceiling tiles or non-asbestos-containing ceiling tiles that physically enclose other ACM (e.g., spray-on fireproofing) require special treatment. Preventive measures must be taken to ensure that the underlying area does not become contaminated. Any movement of these tiles can result in the release of asbestos fibers. Any work that will result in disturbance of these tiles must be done after occupied school hours and only by workers that have received proper asbestos training. Plastic sheeting must be placed on the floor to contain falling debris. See the following Section 'ACM Above Ceilings' for proper procedural techniques.

After ceiling tile activities are complete, the plastic sheeting must be HEPA-vacuumed and wet-wiped until all visible debris has been removed. Suits and other presumed contaminated equipment and debris must be cleaned, or properly sealed and disposed of according to all applicable regulations.

ACM Above Suspended Ceilings (e.g., Spray-on Fireproofing)

Based on information provided to ATC, no asbestos-containing spray-on fireproofing was located at Essex Elementary School.

Non-Friable ACM

Asbestos-containing or assumed asbestos-containing materials such as floor tile are non-friable in their undamaged state. However, routine maintenance and renovation activities can disturb non-friable ACM and cause it to become friable. When non-friable material is removed, friable asbestos-containing dust and fibers may be released. For this reason, any activities that may possibly break these non-friable materials must be undertaken with care, including the application of control methods and preventive measures.

Control methods to minimize the possibility of creating asbestos dust include using water mist to significantly reduce the release of dust and fibers, together with isolation of the area when disturbing non-friable ACM. Precautions must be taken so as not to allow non-friable materials to become damaged and damaged, thereby causing fibers to be released. Cutting, sanding, abrading or drilling will also promote fiber release from non-friable ACM. As a further safety measure, personal protective clothing should be worn when disturbing these materials.

Asbestos-containing, or assumed asbestos-containing floor tiles are non-friable in their undamaged state. Small-scale (less than three square feet) repair of these floor tiles may be performed, but the control methods described above must be applied. At no time should any amount of floor tiles be sanded, drilled, damaged, or otherwise damaged. Large-scale repair and/or removal of floor tiles will require plans to be designed by a Massachusetts licensed designer. In this event, a simplified containment system may be constructed for the ACM locations.
Note: Refer to 'Preventive Measures, in Part VII above, and Appendix B of the Rule for additional information regarding appropriate work practices.

Glove-Bag Technique

The glove-bag technique is primarily used to remove or repair asbestos-insulated pipes or valves. This procedure requires two people. Follow all applicable regulations and proceed as follows.

1. MATERIALS NEEDED

a. Glove-bag
b. Two garden sprayers
c. Surfactant
d. Duct tape
e. Disposal bags
f. Retractable utility knife
g. Scrub brush or scrub pad, rags
h. Re-wettable fiberglass cloth
i. Re-sealable storage bags
j. Heavy-duty hand stapler and staples
k. Polyethylene sheeting
l. Asbestos warning signs
m. Smoke tubes
n. Aspirator bulb
o. HEPA vacuum cleaner
p. Bucket of water
q. Disposable clothing
r. Half-face negative pressure respirator
s. Bridging encapsulant
t. Spray bottle

2. TECHNIQUE

Preparation Activities

a. All persons not immediately involved in glove-bag activities must be excluded from the work area. Sufficient physical barriers must be installed to limit access to the work area for the duration of the glove-bag operation.

b. All employees who perform glove-bag operations must be provided with appropriate personal protective equipment, at a minimum, half-face negative pressure respirators equipped with HEPA filters and full-body disposable Tyvek suits or equivalent.

c. All moveable objects must be removed from the work area. Any reusable items that may previously have been contaminated with asbestos must be HEPA-vacuumed and/or wet-wiped. Non-moveable objects may be sealed with six-mil polyethylene sheeting and duct tape.

d. Check the integrity of the pipe insulation. If the insulation is loose, damaged, or if it is believed that cutting into the insulation will worsen its condition, do not proceed. Old, deteriorated pipe insulation may become loose during the repair or removal process, generating airborne asbestos fibers.

e. Gather all necessary tools and supplies. Use the garden sprayers to mix the surfactant, water, and encapsulant separately according to the manufacturers' guidelines.

f. Cut two pieces of re-wettable fiberglass cloth to cap the ends of the insulation. The inner diameter should be one-half inch smaller than the diameter of the pipe itself (not the insulation). The outer diameter of the cap should be about three inches longer than the diameter of the pipe insulation. Cut a slit through one side of the cap. Cut additional pieces of cloth in strips to be used as a patch if necessary. Place pieces in the re-sealable storage bag.

g. Seal off the work area and post asbestos warning signs, as required by DLS 453 CMR 6.14.

h. Put on the negative pressure respirator and perform negative and positive pressure checks. Put on the disposable clothing.

i. Adhere six-mil polyethylene sheeting to the floor in the immediate work area with duct tape.

j. Place two layers of duct tape around the pipe at each end where the glove-bag will be attached. Determine the distance by holding the glove-bag up to the pipe to determine the length. The duct tape serves two purposes: (1) it provides a good surface on which to seal the ends of the glove-bag; and (2) it minimizes the possibility of releasing fibers when the tape is removed.

k. With the retractable utility knife, cut from the top of the glove-bag down the side seams so as to create incisions approximately twelve inches long.

l. Run duct tape horizontally along one of the top flaps for reinforcement.

m. Place the utility knife, rags, nylon scrub brush or scrub pad, and re-wettable fiberglass cloth into a re-sealable storage bag and place them in the tool pouch of the glove-bag.

n. Place the glove-bag around the section of pipe to be worked on and staple the top together with staples approximately one inch apart.

o. Fold the stapled section over and tape it horizontally to the glove-bag with short pieces of duct tape.

p. Lift up the glove-bag so that the bottoms of the side incisions are flush against the bottom of the pipe insulation. There should be adequate room at the top of the glove-bag to reach over the top of the pipe. If the glove-bag is not lifted up and taped, there may be insufficient room to cut the top of the pipe insulation. Seal all seams, holes, cracks, etc. securely with duct tape.

q. Poke a hole at the top of the glove-bag large enough to allow the end of the smoke tube to be inserted.

r. Pre-cut a few pieces of duct tape and set aside for sealing the holes and any leaks. If a hole is not already provided, tape a portion of the bag below the gloves and cut a cross slit. Insert HEPA vacuum hose and reseal bag around hose securely with duct tape.

s. Holding the smoke tube into a wastebasket, carefully snip off both ends of the smoke tube using a pair of scissors. Eye protection should be worn to protect against stray pieces of glass. Place one end of the smoke tube into the aspirator bulb and insert the other end into the glove-bag.

t. Squeeze the aspirator bulb until there is adequate smoke. Do not allow too much smoke to enter the bag.

u. Take out the smoke tube, patch the hole and squeeze the bag. Seal any leaks with the duct tape. Place the smoke tube in a bucket of water for 5-10 minutes and discard.

v. Insert the wand of the garden sprayer into the same hole used for the smoke tube. Tape the wand securely with duct tape.

Removal and/or Repair Activities

w. If an aluminum jacket is present on the insulation, remove with tin snips and wire cutters. Fold the sharp edges inward to prevent cutting the waste disposal bag and place gently in the bottom of the bag. Be careful not to cut yourself on the sharp edges. The insulation should now be exposed.

x. Wet the asbestos pipe insulation thoroughly and begin cutting with the retractable utility knife. Water should be sprayed on the cutting area and sides of the bag throughout the process to reduce dust levels in the glove-bag. Use HEPA vacuum to filter air, if necessary. As the material is cut off gently, place the insulation in the bottom of the bag. Wet the material on the bottom of the bag as well as any remaining debris on the pipe.

y. Clean all debris off the pipe with water, scrub brush, and rags. Clean excess debris from the exposed ends remaining on the pipe.

z. Wet the cloth end pieces made from the re-wettable fiberglass cloth and apply to exposed ends of asbestos. Enclose all visible insulation with patch strips as necessary. Any asbestos that has been exposed as a result of the glove-bag operation must be properly repaired, encapsulated, or enclosed prior to removal of the glove-bag.

Disposal and Clean-Up Activities

aa. Spray the entire inside of the bag and clean off the retractable utility knife and all cleanable equipment and tools that will be used in the future. The rags and scrub brush should be left in the bag and discarded with the rest of the waste since they cannot be adequately cleaned.

bb. With the HEPA vacuum running, carefully remove the clean surfactant sprayer and quickly replace with encapsulant sprayer. Use encapsulant to lock down any invisible fibers and again spray down entire bag.

cc. Grab the cleaned tools with one glove and invert the glove to the outside of the bag. Tie off the glove with string or duct tape in two areas and cut the glove between the two sealed areas. Place the section of glove containing the tools in the water bucket. Open this glove underwater and re-clean all tools in the water. Remove any gross chunks of debris and place in a pre-labeled asbestos disposal bag. Dispose of inverted glove in disposal bag.

dd. Twist the glove-bag several times at the midsection (below the water sprayer hole) and seal it. This will isolate the contained debris in the bottom of the bag while the glove-bag is removed from the pipe.

ee. With the HEPA vacuum running, carefully remove the encapsulant wand from the bag and tape the hole promptly and securely.

ff. With the HEPA vacuum on the low-flow setting, gently collapse the glove-bag. Carefully remove the vacuum nozzle and seal off the hole with duct tape.

gg. Finish twisting the bag to form an airtight constriction. Firmly secure the constriction with duct tape.

hh. Slip the disposal bag around the glove-bag (still attached to the pipe). Slowly cut open the top of the glove-bag and carefully fold it down into the disposal bag. Do not remove duct tape attached to pipe.

ii. Remove air from disposal bag, twist the top of the bag, and seal securely with duct tape. It is recommended that the disposal bag be double-bagged. Make sure the outside bag is properly labeled. All waste must be disposed of properly. Carefully place bag in a sealed, labeled, leak-tight container for temporary storage until disposal. Dispose of ACM as described in 'ACM Waste' in Part VII.

jj. Finish cleaning the tools in the water bucket and carefully pour wash water into disposal bag, rinse bucket with a sprayer, and dispose of this water in the disposal bag as well. Properly clean floor and, if necessary, polyethylene sheeting, using either HEPA vacuum or wet methods, and fold the polyethylene sheeting inward and place in disposal bag. Remove the disposable suits and place in disposal bag.

kk. Remove the respirator, clean, and store.

ll. After re-wettable fiberglass cloth has dried, paint with latex to ensure ACM is sealed airtight.

Additional glove-bag techniques and requirements are also described in Appendix B of the Rule, Appendix G of OSHA 29 CFR 1926.1101, and DLS 453 CMR 6.14(4).

Mini-Enclosure Operations

1. Persons not immediately involved in asbestos-related activities are to be excluded from the work area. Use physical barriers where necessary to limit access to the work area for the duration of the work.

2. Construct airtight barriers to prevent the release of asbestos fibers. Where feasible, glove-bags are permitted in place of barriers to remove insulation on pipes and ducts.

3. Adequately wet the asbestos before disturbing it. Removed asbestos and asbestos-contaminated items are to be containerized in two six-mil polyethylene bags, or double-wrapped in six-mil polyethylene sheeting. If the material has sharp edges, double-wrap or bag it and then place the material in metal, fiber, or plastic drums that can be sealed.

4. Properly repair, enclose, or encapsulate friable asbestos that has been exposed during asbestos work.

5. HEPA-vacuum and wet-wipe until there is no visible debris or dust.

6. Asbestos-containing waste must be containerized, transported, and disposed of at an approved asbestos landfill in accordance with all applicable regulations.

Asbestos-Debris Clean up Procedures

Any debris suspected of containing asbestos found on the floor, tops of ceiling tiles, or other building structures should be cleaned up immediately. Asbestos debris is extremely friable. Remember, any suspected debris that is equal to or greater than three linear or square feet must be cleaned up by an accredited and licensed asbestos abatement contractor according to a plan designed by an accredited and licensed project designer.

1. WHEN ASBESTOS-CONTAINING DEBRIS IS DRY OR DAMP AND SMALL IN SIZE

a. Isolate and seal the work area and post warning signs, as required by DLS 453 CMR 6.14.

b. Thoroughly wet-mop, using a bucket of water, rags and/or mops, all of the structures and items on which the debris has fallen. Be sure all visible debris is removed.

c. Vacuum the floor using a HEPA vacuum. Again, be sure all visible debris is removed.

d. When the area is dry, inspect for any visible asbestos debris. Sometimes wet asbestos debris becomes hidden during the clean-up. If any visible asbestos material is found, repeat the wet-mop or HEPA-vacuuming procedure until no visible asbestos debris is observed.

e. Dispose of the protective clothing, mop heads, and rags into a six-mil polyethylene disposable bag. Pour the water from the bucket into the disposal bag also. Twist the top of the polyethylene bag and seal it with duct tape. Double-bag the waste material with another six-mil polyethylene bag. Dispose of the bagged asbestos waste according to all applicable regulations.

f. Remove respirator, clean, and place in re-sealable storage bag.

g. Clean the bucket in a sink, if available, and thoroughly rinse the sink used.

h. Remove barriers and posted warning signs.

2. WHEN ASBESTOS DEBRIS IS TOO WET OR TOO LARGE TO BE VACUUMED

a. Isolate and seal the work area and post warning signs as required by DLS 453 CMR 6.14.

b. Thoroughly wet the asbestos material and the surrounding area to a distance of six inches with the garden sprayer. Use a light mist of water when wetting the area and the material, as a heavy stream of water could dislodge and disperse asbestos fibers.

c. If the material is intact and too large to be easily handled with a shovel, pick up the wet material and place it in a six-mil polyethylene disposable bag.

d. Scoop up smaller debris with a shovel, dust pan, or garden trowel and place in a six-mil polyethylene bag. Use another washable item, such as another garden trowel or ice scraper, to push the material into the shovel, dustpan, or trowel. **DO NOT USE A BROOM OR BRUSH!** A broom or brush cannot be decontaminated and also will increase the possibility of dispersing asbestos fibers into the air.

e. Wet-mop the entire area and items that the asbestos material contacted, using a bucket of water, rags, and mops. If the floor is carpeted, vacuum the carpet with a HEPA-filtered vacuum cleaner. If the carpet is wet, or the debris is wet, the carpet must be steam-cleaned. A HEPA-filtered vacuum cleaner cannot be used to pick up water or wet material unless the vacuum is designed to do so.

f. Wash the items used in the cleanup, including hands, shovel, ice scraper, etc., by holding items over the six-mil disposal bag and washing them thoroughly with the garden sprayer. Pour the bucket of contaminated water into the disposal bag.

g. Place the protective clothing, mop heads, and rags in a six-mil polyethylene disposable bag and dispose of as contaminated waste. Twist the top of the polyethylene bag and seal it with duct tape. Double-bag the waste material with another six-mil polyethylene bag.

h. Place the respirator in a re-sealable storage bag and take it to a sink to clean.

i. Clean the respirator, re-clean the bucket, and thoroughly rinse the sink. Store the respirator after cleaning.

j. Remove the barriers and posted warning signs.

Asbestos Emergency Procedures

An asbestos emergency situation is one in which there is an unexpected change in the condition of asbestos-containing material that results in the release of asbestos fibers. This is called an asbestos fiber release episode. Fiber release episodes have the potential to contaminate the area and expose the building occupants to asbestos fibers.

The following procedures should be followed in the event of an emergency:

1. Remove occupants from the immediate area and contact the appropriate building supervisor and the School's Designated Person.

2. Isolate the area as described in DLS 453 CMR 6.14.

3. Trained personnel who will perform the work should wear the appropriate disposable clothing and respiratory protection.

4. Vents and ducts leading into or out of the emergency area should be shut down and sealed with six-mil polyethylene sheeting and duct tape according to DLS 453 CMR 6.14 (2)(a)(2).

5. If the asbestos debris or material is less than three linear or square feet, continue by following the "Asbestos Debris Clean-up Procedures" described above. If the asbestos material is greater than or equal to three square or linear feet, **DO NOT TOUCH OR REMOVE THE ASBESTOS**. Contact a Massachusetts licensed asbestos abatement contractor and a Massachusetts accredited project designer.

HEPA Vacuum

The HEPA vacuum cleaner is the **ONLY** vacuum cleaner designed to clean asbestos debris. Using a household or shop vacuum will not only contaminate the vacuum cleaner itself, but will expose the user and the area to high levels of airborne asbestos dust.

It is important that personnel read and follow manufacturer's directions for proper use and maintenance of the HEPA vacuum. Some HEPA vacuum cleaners cannot pick up wet materials. Consult the manufacturer's directions.

CLEANING AND MAINTENANCE

When the inside of the vacuum cleaner needs to be accessed, whether to change a filter, a bag, or a part, the following procedures must be followed.

1. Gather the necessary equipment required by this section, including:

    a. Half-face negative pressure respirator
    b. Re-sealable storage bag or similar substitute
    c. Disposable clothing
    d. Bucket of water
    e. Sponges or rags
    f. Disposal bags
    g. Duct tape

2. Take the HEPA vacuum cleaner to a location away from non-authorized personnel.

3. Put on the half-face negative pressure respirator and disposable clothing.

4. Perform the necessary maintenance or repair according to the manufacturer's instruction. Place any of the contaminated, used, or worn parts, bags, and filters in the six-mil polyethylene disposal bag.

5. With a damp rag or sponge, clean visible debris from the interior and exterior of the vacuum cleaner.

6. Pour the bucket of water into the disposal bag. Thoroughly rinse the bucket and pour the rinse water into disposal bag.

7. Place the sponge or rag in the six-mil polyethylene disposal bag, along with the disposable clothing and any other contaminated items.

8. Seal the six-mil bag securely with duct tape, making sure there are no leaks in the bag. Place the used and sealed disposal bag into a second labeled six-mil polyethylene disposal bag. Twist the top of the bag and seal with duct tape.

9. Remove, clean, and store respirator.

10. Store and dispose of the asbestos waste properly.

8.0 RECORDKEEPING

Summary

Pursuant to requirements specified in the Rule, the LEA is responsible for maintaining adequate records for all the asbestos activities listed below in two locations: (1) the Local Education Agency office; and (2) the School Administration's offices. Refer to Section 763.94 of the Rule for the specific items required to be recorded for each activity.

It is recommended that the sample forms included in this section be used as a guide from which the LEA may develop its own forms. If the sample forms are chosen to be used, the LEA must ensure they provide a record of all of the information required by the Rule and all other applicable regulations. The guidance forms included within this section in no way supersede or replace records that may be necessary to comply with any applicable asbestos regulations. The LEA must take care to remain informed and ensure compliance with all new and existing regulations and update their methods of recording activity accordingly. This is especially important as long as any ACM remains in the School and building occupants may come in contact with or otherwise handle asbestos-containing materials. It is also recommended that the LEA maintain updated copies of the blank forms it chooses to use in this Record-keeping section.

The following asbestos activities, projects, and occurrences, and the entities involved in such projects, are to be recorded as required in Section 763.94 of the Rule. The activities to be recorded include, but are not limited to:

1. Preventive Measures
2. Response Actions
3. Contractors or Personnel Involved
4. Air Monitoring and Results
5. Personnel Training
6. Periodic Surveillance
7. Cleaning (per Section 763.91© of the Rule)
8. Operation and Maintenance (O&M) Activities
9. Major Asbestos Activities (per Section 763.91(e) of the Rule)
10. Fiber Release Episodes

Additional records required by OSHA (particularly if negative pressure respirators are used) include those required for, but are not limited to, medical surveillance and respiratory protection.

Sample Record Forms

In order to maintain all proper records required, it is essential to establish an organized format for record keeping. The following record forms and recommended formats are provided as guidance for creating and maintaining adequate records. The information requested in the forms should only be viewed as minimum requirements as stated in the Rule. It is important to be sure that additional records be kept as necessary to fully comply with all applicable regulations.

Additional record-keeping forms, such as medical surveillance or respiratory protection forms, may similarly be recorded and continued as necessary. Keep a blank copy of the record forms used in the Record-keeping section and revise as necessary. Copy several blank forms. Keep these blanks and completed forms in the Records section.

Project records may be compiled (copied as necessary in the case of repeat records, such as Worker Training) and grouped together, project by project, in order of occurrence.

9.0 FORMS

FORM A PERIODIC SURVEILLANCE & RE-INSPECTION SIGNOFF TABLE

SIX-YEAR PLAN

Essex Elementary School, Essex, MA

Form No. A-_____

	LATEST DATE	SURVEYOR OR INSPECTOR NAME	PROJECT DATE(S)	RECORD FORM NO(S).
SURVEILLANCE: 05/2020				
SURVEILLANCE: 11/2020				
SURVEILLANCE: 05/2021				
SURVEILLANCE: 11/2021				
SURVEILLANCE: 05/2022				
RE-INSPECTION: 11/2022				
SURVEILLANCE: 05/2023				
SURVEILLANCE: 11/2023				
SURVEILLANCE: 05/2024				
SURVEILLANCE: 11/2024				
SURVEILLANCE: 05/2025				
RE-INSPECTION: 11/2025				

(Periodic Surveillance every 6 months thereafter. Re-inspection every 3 years thereafter.)

FORM B ACTIVITY/PROJECT RECORD

Essex Elementary School, Essex, MA

Project No. _____ Form No. B-_____

Measure or Action: _____

_____

If Periodic Surveillance or Re-inspection, Record Form No(s). _____

Start Date: _____ Completion Date: _____

ACM Type: Check Appropriate Material Type; see appropriate ACM Table or Summary)

F - Friable
NF – Non-Friable
S - Surfacing
T - Thermal
M - Miscellaneous
A - Other ACM

F/S	_____	F/M	_____
NF/S	_____	NF/M	_____
A/F/S	_____	A /F/M	_____
A/NF/S	_____	A/NF/M	_____
A/T	_____	NF/O	_____

ACM Description: _____ Homogeneous Area: _____

Specific Area Location(s): _____

ACM Location in Area(s): _____

HVAC Supply: Passive Direct Air Movement: High Moderate Low

Air System: Shut Down Isolated Not Present

Was Area Isolated? Yes No Proper Signs Posted? Yes No

Project Description and Methods: _____

_____

_____

_____

Why was action taken? _____

_____

_____

Was Project Resultant of a Major Fiber Release Episode (> 3 feet)? Yes No

Was Project Resultant of a Minor Fiber Release Episode (< 3 feet)? Yes No

FORM B ACTIVITY/PROJECT RECORD (CONTINUED)

Essex Elementary School, Essex, MA

Was any ACM Removed? Yes No Total Amount _____

If YES: Storage Record Form No. _____

Disposal Record Form No. _____

If less than or equal to 3 linear or square feet then:

School Worker Record Form No. _____

Worker Training Record Form No(s). _____

Contractor Record Form No(s). _____

If greater than 3 linear or square feet then:

Design Consultant Record Form No(s). _____

Air Monitoring Consultant Record Form No(s). _____

Laboratory Consultant Record Form No(s). _____

Contractor Record Form No(s). _____

Does ACM remain in location? Yes No Amount _____

If YES: Describe additional Preventive Measures:_____

_____

_____

* Continue with Operations and Maintenance Program.

If NO: Be sure to update asbestos location blueprint, diagrams, and/or written description and adjust periodic surveillance forms.

Date of Notification to: DLS _____ DEP _____ EPA _____

Inspection Form No(s). _____

Name of Competent or Designated Person: _____

School Worker Record Form No. _____

Signature: _____ Date: _____

FORM C SCHOOL WORKER RECORD

Essex Elementary School, Essex, MA

Form No. C-_____

Project No. _____ Project Form No. _____ Project Date(s) _____

Designated Person _____

Respiratory Workers' Protection Names	Date(s) of Activity	Worker Training Record Form No(s).	Medical Surveillance Record Form No(s).	Record Form No(s).

FORM D Design Consultant Record

Essex Elementary School, Essex, MA

Form No. D-_____

Project No: _____ Project Form No.: _____

Consultant Company Name: _____

Address: _____

_____

_____

Telephone: _____

Specification Location: _____

Project Designer Name: _____

State of Accreditation: _____

Accreditation Number: _____

Completion Date Project Designed: _____

Project Designer Signature: _____

FORM E Abatement Contractor Record

Essex Elementary School, Essex, MA

Form No. E-_____

Project No. _____ Project Form No. _____

Project Date(s): _____

Designated Person: _____

Contractor Name: _____

Address: _____

_____

Telephone: _____

Contractor's State of Accreditation: _____

Accreditation Number: _____

Worker Name	Date on Site	State of Accreditation	Accreditation Number	Day Supervisor/ Foreman

FORM F Air Monitoring Consultant Record

Essex Elementary School, Essex, MA

Form No. F-_____

Project No. _____ Project Form No. _____

Designated Person: _____

Consultant Company Name: _____

Address: _____

_____

Telephone: _____

Air Sample Collection Date: _____

Air Sample Collector's Name: _____

State of Accreditation: _____

Accreditation Number: _____

Collectors Signature: _____

Sample No.	Sample Location	Results

FORM G Laboratory Record

Essex Elementary School, Essex, MA

Form No. G-_____

Project No. _____ Project Record Form No. _____

Project Date(s): _____

Designated Person: _____

Consultant Company Name: _____

Address: _____

_____

Telephone: _____

State of Accreditation: _____

Accreditation Number: _____

Check if applicable:

_____ This laboratory is accredited by the National Institute for Standards and Technology to conduct air sample analysis using Transmission Electron Microscopy (TEM).

_____ This laboratory is enrolled in the EPA-sponsored Proficiency Analytical Testing Program for Phase Contrast Microscopy (PCM).

Sample Number	Result of Analysis	Method of Analysis	Date of Analysis	Name of Analyst	Signature Analyst

FORM H Disposal Record

Essex Elementary School, Essex, MA

Form No. H-_____

Project No. _____ Project Record Form No. _____

Project Date(s): _____

Designated Person: _____

Site Name: _____

Address: _____

_____

Telephone: _____

How Material is Containerized: _____

Material Quantity: _____

Date Material Transported
for Disposal: _____

Transporter Name: _____

Address: _____

_____

Telephone: _____

FORM IStorage Record

Essex Elementary School, Essex, MA

Form No. I-_____

Project No. _____ Project Record Form No. _____

Project Date(s): _____

Designated Person: _____

Storage Site: _____

Address: _____

_____

Telephone: _____

Storage Area at Site: _____

Material Quantity: _____

Area Sealed? _____ How: _____

_____

Area Secured? _____ How: _____

_____

Date Material Transported
for Disposal _____

FORM J Worker Training Record

Essex Elementary School, Essex, MA

_____ Check if Designated Person

Form No. J-_____

Individual's Name	Individual's Identification No.
Permanent Street Address	Emergency Contact Person
Permanent City, State, Zip Code	Emergency Contact Phone No.
Home Phone No.	Attending Physician
Job Title	Attending Physician's Phone No.

ASBESTOS TRAINING HISTORY

Course Date	Course Location	Course Title	Training Center Name	Hours of Instruction	Certification Number

THIS INDIVIDUAL IS QUALIFIED TO PERFORM THE FOLLOWING TYPE(S) OF ASBESTOS-RELATED WORK

1) Restricted to maintenance work which does not involve the disturbance of asbestos-containing building materials.

2) May perform "small-scale, short-duration" work as defined by the applicable rules and regulations, under proper supervision.

3) May perform "small-scale, short-duration" work as defined by the rules and regulations and is qualified to supervise other workers performing the same type of work.

4) May perform work in any type of asbestos removal project under proper supervision.

5) May perform work on any type of asbestos removal project and is qualified to supervise others performing the same type of work.

_____
Signature

_____ _____
Title Date

_____

_____

_____

_____

_____

_____

_____

_____

FORM K Glove Bag Removal Record

Essex Elementary School, Essex, MA

Form No. K-_____

Date Performed: _____

Designated Person: _____

Performed by: _____

_____

_____

Contractor MA Certification No.: _____

DEP Notification No.: _____

Work Performed: _____

_____

_____

Worker Name: _____

Worker Massachusetts Certification No.: _____

Waste Landfill: _____

Waste Transporter: _____

10.0 MISCELLANEOUS DOCUMENTATION

(Bulk Sample Results, ACM Location Drawings, 6-Month Periodic Surveillance Records, Completed Response Action Records, Licenses, Employee Training Certificates, etc.)

ENVIRONMENTAL • GEOTECHNICAL
BUILDING SCIENCES • MATERIALS TESTING

HAZARDOUS BUILDING MATERIALS INSPECTION REPORT
ESSEX ELEMENTARY SCHOOL
12 STORY STREET
ESSEX, MASSACHUSETTS 01929

PREPARED FOR:

MANCHESTER ESSEX REGIONAL SCHOOL DISTRICT
36 LINCOLN STREET
MANCHESTER, MASSACHUSETTS 01944

PREPARED BY:

ATC GROUP SERVICES LLC
500 WEST CUMMINGS PARK, SUITE 3750
WOBURN, MASSACHUSETTS 01801

ATC PROJECT NO.: 6000002368

NOVEMBER 15, 2016

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1.0 EXECUTIVE SUMMARY

ATC Group Services, LLC (ATC) was retained by Manchester Essex Regional School District to perform a hazardous building materials survey in support of the upcoming renovation project at the Essex Elementary School, which is located at 12 Story Street in Essex, Massachusetts (the Site). The inspection was performed in accordance with ATC Proposal 060-2016-0381. It is ATC's understanding the building is scheduled for renovation.

ATC's scope of work for the hazardous materials building inspection included a survey for asbestos-containing materials (ACM). As a part of this inspection, ATC performed a limited asbestos inspection in representative interior areas, to the degree feasible, in an attempt to identify the presence of hidden ACM.

The Site building is one story, with a basement, and is approximately 16,000 square feet in size. The building was reportedly constructed in 1977 and is primarily comprised of brick and concrete masonry walls with a slab-on-grade concrete foundation. Interior finishes include vinyl floor tiles and painted drywall.

1.1 Asbestos Survey

Section 2.0 discusses the ACM survey methods and results. This survey involved a visual inspection, bulk sampling and inventory of suspect ACM, including locating and quantifying the identified ACM. In consideration that the building is currently occupied, exploratory demolition in representative interior areas to identify the presence of hidden ACM was not performed.

The asbestos survey was performed by Massachusetts Division of Labor Standards (DLS)-certified Asbestos Inspectors Mr. Ricardo Nunes (AI-000091) and Mr. Scott Drinko (AI-000072), on October 18, 2016. A total of eighty-three (83) samples of suspect ACM were collected and seventy-two (72) were analyzed by Polarized Light Microscopy (PLM) to determine asbestos content. The ATC inspectors performed both the visual inspection and bulk sampling in the Site building according to methods outlined in the U.S. Environmental Protection Agency (EPA) guidance document titled, "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Document No. 560/5-85/024).

PLM results indicated that asbestos was detected in the following materials:

- 12" x 12" Brown Floor Tile – Principals Office
- 9" x 9" Red Floor Tile – Guidance Office by Classroom 10
- Black Mastic associated with 12" x 12" Floor Tiles – Hallway by Media Center
- Joint Compound Associated with Gypsum Wall Board – Classroom 18
- 4" TSI Pipe Insulation – Kitchen Store Room
- Purple Sink Coating – Hallway
- Black Sink Coating – Classroom 1
- Gray Sink Coating – Classroom 18
- Interior Door Frame Caulking – Classroom 7 and Basement Art Room

ATC has assumed that the following asbestos-containing materials will be present in areas that were inaccessible for sampling:

- Pipe insulation in wall cavities, chases, plenums etc.

ATC has confirmed that recent renovations including the new floor tiles are non-asbestos. The boxes of remaining floor tiles were inspected and are not asbestos-containing.

Limitations

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the field of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

Environmental evaluations are limited in the sense that conclusions and recommendations are developed and information obtained from limited research and secondary sources. Except as set forth in this report, ATC has made no independent investigations as to the accuracy or completeness of the information derived from the secondary sources and personal interviews and has presumed that such information was accurate and complete.

This report is intended for the sole use of Manchester Essex Regional School District. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations found therein, is at risk of said user.

CERTIFICATION OF RESULTS

This report has been prepared for the exclusive use of Manchester Essex Regional School District. Photocopying of this document by parties other than those designated by Manchester Essex Regional School District, or use of this document for purposes other than intended, is prohibited.

Sincerely,

ATC Group Services, LLC

Ricardo Nunes
Project Manager
For ATC Group Services, LLC
Office: 781-932-9400
Email: ric.nunes@atcassociates.com

Scott Drinko
Senior Project Manager
For ATC Group Services, LLC
Direct: 781-932-9400
Email: scott.drinko@atcassociates.com

2.0 ASBESTOS CONTAINING MATERIALS SURVEY

2.1 Sampling Methodology

The asbestos survey was performed by Massachusetts Division of Labor Standards (DLS)-certified Asbestos Inspectors Mr. Ricardo Nunes (AI-000091) and Mr. Scott Drinko (AI000072), on October 18, 2016. Bulk samples, representing individual homogenous areas of suspect materials, were collected in a randomly distributed manner, in accordance with the methods outlined below.

Building materials exist in the form of thermal systems insulation (TSI), surfacing and miscellaneous materials.

The following generally illustrates the sampling strategy employed by ATC where feasible:

(a) Surfacing materials - In a randomly distributed manner, collect bulk samples of surfacing materials, representative of each homogeneous area, and not assumed to be ACM.

  (1) Collect at least three (3) bulk samples from each homogeneous area that is less than or equal to 1,000 square feet (ft^2).
  (2) Collect at least five (5) bulk samples from each homogeneous area that is greater than 1,000 ft^2, but less than or equal to 5,000 ft^2.
  (3) Collect at least seven (7) bulk samples from each homogeneous area that is greater than 5,000 ft^2.

(b) Thermal systems insulation.

  (1) In a randomly distributed manner, collect at a minimum, three (3) bulk samples of thermal systems insulation material, representative of each homogeneous area, and not assumed to be ACM.
  (2) Collect, at a minimum, one (1) bulk sample of patched thermal systems insulation, representative of each homogenous area, and not assumed to be ACM, providing the section of patch was less than six (6) linear or square feet.
  (3) Collect, at a minimum, three (3) representative bulk samples of each insulated mechanical system not assumed to be ACM, including, but not limited to cementitious material used on pipe fittings such as tees, elbows, or valves. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.
  (4) Bulk samples are not required to be collected from any homogeneous area where the accredited asbestos inspector has determined that the thermal systems insulation is a non-suspect material (i.e., fiberglass, foam glass, rubber, or any other non-ACM).

(c) Miscellaneous materials - Collect, at a minimum, two (2) representative bulk sample of each miscellaneous material not assumed to be ACM, including, but not limited to ceiling tiles, floor tiles, associated floor tile mastic, roofing materials, waterproofing, etc. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.

2.2 Analytical Method

Bulk samples of suspect materials were analyzed by Asbestos Identification Laboratory (AIL) of Woburn, Massachusetts by means of the EPA-approved polarized light microscopy with dispersion staining (PLM/DS) method using the visual estimation technique for asbestos quantification. AIL is fully accredited for bulk sample analysis under the National Voluntary Laboratory Accreditation Program (NVLAP), administered by the National Institute of Standards and Technology, and is also licensed by the Massachusetts DLS (License Nos. AA-000208). The PLM/DS analytical method is modeled after 40 CFR

Part 763, Subpart F, Appendix A: "Interim Method for the Determination of Asbestos in Bulk Insulation Samples."

Bulk samples were analyzed for asbestos content using EPA Method 600/R-93/116. The visual estimation technique was used to quantify asbestos concentrations. Only the asbestos content, if any, is recorded in the bulk sample 'Report of Analysis' (Appendix A). If a material contains 1% asbestos or greater, it is considered to be asbestos-containing material.

2.3 Asbestos-Containing Materials

ATC conducted the asbestos survey in representative interior areas. Appropriate efforts were made in representative areas of the building to identify multiple layers of flooring systems, as well as any suspect materials located within wall cavities, chases, plenums and above suspended ceiling systems. In consideration that the building is currently occupied, exploratory demolition in representative interior areas to identify the presence of hidden ACM was not performed. Note that ATC did not disassemble mechanical equipment or electrical gear that may have suspect ACM internal components.

The following table presents a list of the identified, confirmed ACMs in the renovation areas. Note that an ACM is defined by MassDEP as any material or product containing one percent or greater asbestos by weight.

Table 1: Summary of Identified ACM
Essex Elementary School
Essex, Massachusetts

Location(s)	Material	Result
Principal's Office	12" x 12" Brown Floor Tile	15% Chrysotile
Guidance Office	9" x 9" Red Floor Tile	10% Chrysotile
Hallway by Media Center	Black Mastic Associated With 12" x 12" Floor Tiles	2% Chrysotile
Classroom 18	Joint Compound and Associated Gypsum Wall Board	2% Chrysotile
Old Section Hallway	Purple Sink Coating	10% Chrysotile
Kitchen Store Room	4" TSI Pipe Insulation	15% Chrysotile 5% Amosite
Classroom 1	Black Sink Coating	15% Chrysotile
Classroom 18	Gray Sink Coating	20% Chrysotile
Classroom 7, Basement Art Room	Interior Door Frame Caulking	2% Chrysotile

Table 2: Summary of Non-ACM
Essex Elementary School
Essex, Massachusetts

Material	Sample Location(s)
Black Mastic Associated with 12" x 12" Brown Floor Tile	Principal's Office
Black Mastic Associated with 9" x 9" Red Floor Tile	Guidance Office
12" x 12" Blue Floor Tile	Hall by Media Center, Classroom 1
Yellow Carpet Mastic	Main Office
Residual Black Mastic	Main Office
Cove Base Mastic	Staff Room, Classroom 12
Small Fissured 2' x 4' Ceiling Tile	Old Section Hallways
Large Fissured 2' x 4' Ceiling Tile	Old Section Hallways
2' x 2' Ceiling Tile	Book Room D

Material	Sample Location(s)
2' x 4' Gypsum Ceiling Tile	Kitchen
1' x1' Spline Ceiling Tile	Main Entrance
Brown Glue Daubs on Fiberglass Ceiling Tile	Boy's Bathroom, CPU Tech Room 10
Gypsum Wall Board	Classroom 18, Speech Room
Gypsum Wall Board	Basement Build-out
Joint Compound Material	Basement Build-out
6" TSI Pipe Elbow	Hallway Outside Guidance Office
New Addition Purple Sink Coating	Classroom 19, Work Room
New Addition Carpet Mastic	Work Room, Media Room
New Addition Cove Base Mastic	Room 29, Faculty RR
Flashing Mastic	South Wall Above Door Opening
Breeching Insulation	Boiler Room
TSI End Cap Sealant	Boiler Room
Cement TSI End Cap Sealant	Boiler Room
New Addition Pink Gypsum Wall Board	Staff RR
Joint Compound Material	Staff RR
New Addition 2' x 4' Ceiling Tile	Staff RR, Boy's Locker Room
New Addition End Cap Sealant	Gym, Addition Hallway
New Addition TSI Pipe Elbow	Gym, Hallway, Storage

2.4 Consideration for Hidden Materials

ATC conducted the asbestos survey in representative interior areas throughout the building. Appropriate efforts were made in representative areas of the building to identify multiple layers of flooring systems, as well as any suspect materials located above suspended ceiling systems, that could be temporarily moved and replaced. In consideration that the Site building was occupied at the time of the inspection, ATC did not performed exploratory demolition to identify the presence of hidden ACMs. Note that ATC did not disassemble mechanical equipment or electrical gear that may have suspect ACM internal components.

ATC recommends that if a suspect material has not been positively identified, but is similar in mode of occurrence or physical properties as other identified ACM, it should be considered asbestos-containing. Only through further sampling and analysis should a suspect material be identified as non-asbestos.

2.5 Recommendations

ATC understands that renovations are scheduled for the building. All identified ACM that will be impacted by the planned renovation project should be properly removed and disposed by a Massachusetts-licensed Asbestos Contractor prior to disturbance.

ATC recommends that precautions be taken to prevent unauthorized disturbance of identified ACM in this report.

ATC also recommends the following as part of the abatement process:

- Although the asbestos contractor is required to follow the requirements outlined in federal, state and local regulations regarding asbestos during any abatement project, ATC recommends the development of a project specification and the use of project oversight to ensure compliance with all applicable regulations as well as protect the interest of the client for all abatement work performed at the Site. The project specification shall reference the regulations pertinent to each project, including those work procedures that shall be followed by asbestos abatement personnel.

- As part of each abatement contractor bidding process, a unit price schedule for the abatement of asbestos-containing materials should be established. The unit price schedule should include costs for those materials identified within this report, as well as those materials that may potentially be uncovered during renovation/demolition activities. Included should be unit prices for the removal of asbestos-containing materials (e.g., floor tile, floor tile mastic), as well as those non-asbestos-containing materials, which may be asbestos contaminated (e.g., carpeting, plywood, etc.).

- Project oversight will provide Manchester Essex Regional School District with on-site technical expertise during all phases of the abatement work. Project oversight provides a constant management of the abatement project to ensure that all identified asbestos-containing materials are removed in accordance with all applicable regulations and to prevent an asbestos fiber release. Tasks performed during project oversight should include periodic work inspections to ensure that all procedures employed by the abatement contractor are acceptable and air monitoring around each work area to detect elevated asbestos fiber levels.

APPENDIX A

ASBESTOS BULK SAMPLE LABORATORY REPORTS

Asbestos Identification Laboratory

165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600
Web: www.asbestosidentificationlab.com
Email: mikemanning@asbestosidentificationlab.com

Batch: 17337

NVLAP®
Lab Code: 200919-0

November 21, 2016

Scott Drinko
ATC Group Services, Woburn
500 West Cummings Park
Suite 3750
Woburn, MA 01801

Project Number:
Project Name: Essex Elementary School

Date Sampled: 2016-10-18
Work Received: 2016-10-28
Work Analyzed: 2016-11-01

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

Dear Scott Drinko,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project .

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Scott Drinko for your business.

Michael Manning
Owner/Director

November 21, 2016

Scott Drinko
ATC Group Services, Woburn
500 West Cummings Park
Suite 3750
Woburn, MA 01801

Project Number:
Project Name: Essex Elementary School

Date Sampled: 2016-10-18
Work Received: 2016-10-28
Work Analyzed: 2016-11-01

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
01A / 191778	12x12 Brown Floor Tile	Principal's Office	brown	Non-Fibrous 85	Detected Chrysotile 15
01B / 191779	12x12 Brown Floor Tile	Principal's Office			Not Analyzed
02A / 191780	Black Mastic	Assoc w/ 01A	black	Non-Fibrous 100	None Detected
02B / 191781	Black Mastic	Assoc w/ 01B	black	Non-Fibrous 100	None Detected
03A / 191782	9x9 Red Floor Tile	Guidance Office by Rm 10	multi	Non-Fibrous 90	Detected Chrysotile 10
03B / 191783	9x9 Red Floor Tile	Speech/Math Rm by Rm 1			Not Analyzed
04A / 191784	Black Mastic	Assoc w/ 03A	black	Non-Fibrous 100	None Detected
04B / 191785	Black Mastic	Assoc w/ 03B	black	Non-Fibrous 100	None Detected
05A / 191786	12x12 Blue Floor Tile	Media Center Hall Rm 23	gray	Non-Fibrous 100	None Detected
05B / 191787	12x12 Tan Floor Tile	Classroom #1 Corner	tan	Non-Fibrous 100	None Detected
06A / 191788	Black Mastic	Assoc w/ Blue Tile	black	Cellulose 25 Non-Fibrous 73	Detected Chrysotile 2
06B / 191789	Black Mastic	Assoc w/ Tan Tile	black		Not Analyzed
07A / 191790	Yellow Carpet Mastic	Main Office	yellow	Non-Fibrous 100	None Detected
07B / 191791	Yellow Carpet Mastic	Main Office	yellow	Non-Fibrous 100	None Detected

C-7

C-78

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
08A / 191792	Residual Black Mastic	Assoc w/ 07A	black	Cellulose 10 Non-Fibrous 90	None Detected
08B / 191793	Residual Black Mastic	Assoc w/ 07B	black	Cellulose 10 Non-Fibrous 90	None Detected
09A / 191794	Cove Base Mastic	Classroom 12	yellow	Non-Fibrous 100	None Detected
09B / 191795	Cove Base Mastic	Staff Room	yellow	Non-Fibrous 100	None Detected
10A / 191796	Sm Fissured 2x4 Ceiling Tile	Hall Outside Guidance	multi	Mineral Wool 30 Cellulose 50 Non-Fibrous 20	None Detected
10B / 191797	Sm Fissured 2x4 Ceiling Tile	Hall by Room 15/16	multi	Mineral Wool 30 Cellulose 50 Non-Fibrous 20	None Detected
11A / 191798	Large Fissured 2x4 Ceiling Tile	Hallway Outside Guidance	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
11B / 191799	Large Fissured 2x4 Ceiling Tile	Hall by Rm 15-16	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
12A / 191800	2x2 Ceiling Tile	Book Room D	multi	Mineral Wool 10 Cellulose 60 Non-Fibrous 30	None Detected
12B / 191801	2x2 Ceiling Tile	Book Room D	multi	Mineral Wool 10 Cellulose 60 Non-Fibrous 30	None Detected
13A / 191802	2x4 Gypsum Ceiling Board	Kitchen	multi	Fiberglass 2 Cellulose 5 Non-Fibrous 93	None Detected
13B / 191803	2x4 Gypsum Ceiling Board	Kitchen	multi	Fiberglass 2 Cellulose 5 Non-Fibrous 93	None Detected
14A / 191804	1x1 Spline Ceiling Tile	Main Entrance	multi	Mineral Wool 40 Cellulose 40 Non-Fibrous 20	None Detected
14B / 191805	1x1 Spline Ceiling Tile	Main Entrance	multi	Mineral Wool 40 Cellulose 40 Non-Fibrous 20	None Detected
15A / 191806	Brown Glue Daubs on 1x1 Fiberglass CT	Boy's Bathroom by Rm 2	brown	Non-Fibrous 100	None Detected
15B / 191807	Brown Glue Daubs on 1x1 Fiberglass CT	CPU Tech Rm 10	brown	Non-Fibrous 100	None Detected
16A / 191808	Gypsum Wallboard	Room 18	white	Fiberglass < 1 Cellulose 2 Non-Fibrous 98	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
16B / 191809	Gypsum Wallboard	Speech Room	gray	Cellulose 10 Non-Fibrous 90	None Detected
17A / 191810	Joint Compound	Assoc w/ 16A Room 18	white	Non-Fibrous 98	**Detected** **Chrysotile 2**
17B / 191811	Joint Compound	Assoc w/ 16B Room 18			Not Analyzed
18A / 191812	Gypsum Wallboard	Basement Build Out	multi	Fiberglass < 1 Cellulose 15 Non-Fibrous 85	None Detected
18B / 191813	Gypsum Wallboard	Basement Build Out	multi	Fiberglass < 1 Cellulose 10 Non-Fibrous 90	None Detected
19A / 191814	Joint Compound	Assoc w/ 18A	white	Non-Fibrous 100	None Detected
19B / 191815	Joint Compound	Assoc w/ 18B	white	Non-Fibrous 100	None Detected
20A / 191816	4" Pipe TSI	Kitchen Store Room	white	Mineral Wool 20 Non-Fibrous 60	**Detected** **Chrysotile 15** **Amosite 5**
20B / 191817	4" Pipe TSI	Kitchen Store Room			Not Analyzed
20C / 191818	4" Pipe TSI	Kitchen Store Room			Not Analyzed
21A / 191819	6" Pipe TSI Elbow	Hall Outside Guidance	tan	Mineral Wool 50 Non-Fibrous 50	None Detected
21B / 191820	6" Pipe TSI Elbow	Hall Outside Guidance	tan	Mineral Wool 40 Non-Fibrous 60	None Detected
21C / 191821	6" Pipe TSI Elbow	Hall Outside Guidance	tan	Mineral Wool 40 Non-Fibrous 60	None Detected
22A / 191822	Purple Sink Coating	Hallway	pink	Non-Fibrous 90	**Detected** **Chrysotile 10**
22B / 191823	Newer Addition Purple Sink Coating	Classroom 19			Not Analyzed
22C / 191824	Newer Addition Purple Sink Coating	Work Room			Not Analyzed
23A / 191825	Newer Addition Carpet Mastic	Work Room	yellow	Non-Fibrous 100	None Detected
23B / 191826	Carpet Mastic	Media Room	yellow	Non-Fibrous 100	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
24A / 191827	New Addition Cove Base Mastic	Room 29	yellow	Non-Fibrous 100	None Detected
24B / 191828	New Addition Cove Base Mastic	Faculty RR	yellow	Non-Fibrous 100	None Detected
25A / 191829	Black Sink Coating	Classroom 1	black	Non-Fibrous 85	**Detected** **Chrysotile 15**
25B / 191830	Black Sink Coating	Classroom 8			Not Analyzed
26A / 191831	Gray Sink Coating	Classroom 18	gray	Non-Fibrous 80	**Detected** **Chrysotile 20**
26B / 191832	Gray Sink Coating	Teacher Staff Room			Not Analyzed
27A / 191833	Interior Door Frame Caulking	Classroom 7	multi	Non-Fibrous 98	**Detected** **Chrysotile 2**
27B / 191834	Interior Door Frame Caulking	Classroom 16			Not Analyzed
28A / 191835	Interior Door Frame Caulking	Basement Exterior Door #6 Art Rm	tan	Non-Fibrous 98	**Detected** **Chrysotile 2**
28B / 191836	Interior Door Frame Caulking	Basement Exit Door #6 Art Rm			Not Analyzed
29A / 191837	Flashing Mastic	South Wall Above Opening	black	Non-Fibrous 100	None Detected
29B / 191838	Flashing Mastic	South Wall Above Opening	black	Non-Fibrous 100	None Detected
30A / 191839	Breeching Insulation	Boiler Room	blue	Synthetic 10 Non-Fibrous 90	None Detected
30B / 191840	Breeching Insulation	Boiler Room	blue	Synthetic 10 Non-Fibrous 90	None Detected
30C / 191841	Breeching Insulation	Boiler Room	blue	Synthetic 10 Non-Fibrous 90	None Detected
31A / 191842	End Cap Sealant	Boiler Room	white	Non-Fibrous 100	None Detected
31B / 191843	End Cap Sealant	Boiler Room	white	Non-Fibrous 100	None Detected
32A / 191844	Cement End Cap Sealant	Boiler Room	white	Mineral Wool 40 Cellulose 10 Non-Fibrous 50	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
32B / 191845	Cement End Cap Sealant	Boiler Room	white	Mineral Wool 40 Cellulose 10 Non-Fibrous 50	None Detected
33A / 191846	Addition Pink Gypsum Wallboard	Staff RR	tan	Cellulose 2 Non-Fibrous 98	None Detected
33B / 191847	Addition Pink Gypsum Wallboard	Staff RR	tan	Cellulose 2 Non-Fibrous 98	None Detected
34A / 191848	Joint Compound	Assoc w/ 33A	white	Non-Fibrous 100	None Detected
34B / 191849	Joint Compound	Assoc w/ 33B	white	Non-Fibrous 100	None Detected
35A / 191850	New Addition Gray Gypsum Wallboard	Rm 29	multi	Fiberglass 2 Cellulose 20 Non-Fibrous 78	None Detected
35B / 191851	New Addition Gray Gypsum Wallboard	Rm 30	multi	Fiberglass < 1 Cellulose 50 Non-Fibrous 50	None Detected
36A / 191852	Joint Compound	Assoc w 35A	white	Non-Fibrous 100	None Detected
36B / 191853	Joint Compound	Assoc w 35B	white	Non-Fibrous 100	None Detected
37A / 191854	New Addition 2x4 Ceiling Tile	Staff RR	multi	Mineral Wool 40 Cellulose 40 Non-Fibrous 20	None Detected
37B / 191855	New Addition 2x4 Ceiling Tile	Boy's Locker Room	multi	Mineral Wool 50 Cellulose 30 Non-Fibrous 20	None Detected
38A / 191856	New Addition End Cap Sealant	Gym	multi	Non-Fibrous 100	None Detected
38B / 191857	New Addition End Cap Sealant	Addition Hallway	multi	Non-Fibrous 100	None Detected
39A / 191858	New Addition Pipe TSI Elbow	Gym	gray	Mineral Wool 30 Non-Fibrous 70	None Detected
39B / 191859	New Addition Pipe TSI Elbow	Hallway	white	Mineral Wool 30 Cellulose 10 Non-Fibrous 60	None Detected
39C / 191860	New Addition Pipe TSI Elbow	Storage	white	Mineral Wool 25 Cellulose 15 Non-Fibrous 60	None Detected

Monday 21 November

Analyzed by: Dan Pine

End of Report

Batch: 17337

Client: ATC
Address: Woburn
Project Site & #: Essex Elementary School
Phone / email address: 978 423 4550
Contact: Scott Drinko, Ric Nunes
Relinquish by/date:
Received by/date: 10/28/16
# of Samples Received: 83

CHAIN OF CUSTODY

EPA/600/R-93/116

Asbestos Identification Lab
165 New Boston St.
Suite 227
Woburn, MA 01801
(781)932-9600
www.asbestosidentificationlab.com

Date Sampled: 10/18/16

BATCH# 17337

Rev 12/15

Turnaround Time		Sample Method	
	Less 3 Hrs	☒	Bulk
	Same Day		Soil
	Next Day		Wipe
☒	Two Day		Point Count

Stop on 1st Positive? (Yes/No)
Notify Method: Mail/E-Mail/Verbal
Anayzed By:
Date: 11/1/16

Temp in Celcius = 23

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	% of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI ∥	RI ⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
79	01A	Material: 12x12 Brown Floor Tile; Location: Principals office	0	BR	Y	GN	N	Chrysotile	15	W	∥	+	L	N	1.543	1.550							85
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
79	01B	Material: ⊥; Location: ⊥						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
80	02A	Material: Black mastic; Location: assoc. w/ 01A	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

DNA

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
1	02B	Material: Black mastic Location: assoc. w/01B	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
2	03A	Material: 9x9 red Floor Tile Location: Guidance office by Rm 10	0	MC	Y	GN	N	Chrysotile	10	W	∥	+	C	N	1.573	1.570							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															90
3	03B	Material: ↓ Location: speach/mathrm by Rm 1						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
4	04A	Material: Black mastic Location: assoc. w/03A	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
5	04B	Material: ↓ Location: assoc. w/03B	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

DNA

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
88	05A	Material: 12x12 Blue Floor Tile Location: media Center Hall rm 23	0	GY	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
89	05B	Material: 12x12 Tan Floor Tile Location: classroom #1 corner	0	T	Y	GN	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
88	06A	Material: Black mastic Location: assoc. w/ 05A	0	BK	Y	T	N	Chrysotile	2	W	ll	+	L	N	1.03	1.00							
								Amosite															
								Crocidolite											W				
								Tremolite															
								Anthophylite															
								Actinolite											25				73
89	06B	Material: Black mastic Location: assoc. w/ 05B						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
90	07A	Material: yellow carpet mastic Location: main office	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

DNA

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
91	07B	Material: yellow carpet mastic Location: main office	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
92	08A	Material: residual black mastic Location: assoc w/07A	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite											W				
								Tremolite															
								Anthophylite															
								Actinolite											10				90
93	08B	Material: ⊥ Location: assoc. w/07B	0	BK	Y	T	N	Chrysotile															
								Amosite															
								Crocidolite											W				
								Tremolite															
								Anthophylite															
								Actinolite											10				80
94	09A	Material: cove base mastic Location: classroom 12	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
95	09B	Material: ⊥ Location: staff room	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ‖	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
96	10A	Material sm Fissured 2'x4' ceiling Tile Location Hall outside Guidance	O	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										30	50				20
97	10B	Material ⊥ Location Hall by room 15/16	O	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										30	50				20
98	11A	Material Large Fissured 2'x4' ceiling tile Location Hall outside Guidance	O	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										50	30				20
99	11B	Material ⊥ Location Hall by rm 15/16	O	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										50	30				20
100	12A	Material 2x2 ceiling tile Location Book Room D	O	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										10	60				30

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
01	12B	Material: 2x2 ceiling tile Location: Book Room D	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										10	60				30
02	13A	Material: 2x4 gypsum ceiling board Location: kitchen	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite									I		W				
								Tremolite															
								Anthophylite															
								Actinolite									2		5				93
03	13B	Material: ⊥ Location:	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite									I		W				
								Tremolite															
								Anthophylite															
								Actinolite									2		5				93
04	14A	Material: 1x1 spline ceiling Tile Location: main Entrance	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										40	40				20
05	14B	Material: ⊥ Location:	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite															
								Actinolite										40	40				20

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
8	15A	Material: Brown Glue Daubs on 1x1 fiberglass CT Location: Boys Bathroom by Rm 2	0	BR	Y	H	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
5	15B	Material: ↓ Location: CPU Tech Rm Rm 10	0	BR	Y	H	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
8	16A	Material: gypsum wall board Location: Room 18	0	WH	Y	E GN	Y	Chrysotile															
								Amosite															
								Crocidolite									F		W				
								Tremolite															
								Anthophylite															
								Actinolite									TR		Z				98
09	16B	Material: ↓ Location: speech Room	0	GY	Y	E GN	Y	Chrysotile															
								Amosite											W				
								Crocidolite															
								Tremolite															
								Anthophylite											10				90
								Actinolite															
10	17A	Material: joint compound Location: assoc w/ 16A Room 18	0	WH	Y	GN	Y	Chrysotile	Z	W	∥	+	SN	N	1.5B	1.5C							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															98

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
11	17B	Material: joint compound Location: speech Room assoc. w/16B						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
12	18A	Material: gypsum wall board Location: Basement as Buildout	O	MC	N	F/GN	Y	Chrysotile															
								Amosite															
								Crocidolite									F		W				
								Tremolite															
								Anthophylite															
								Actinolite									TR		15				85
13	18B	Material: ⊥ Location:	O	MC	N	F/GN	Y	Chrysotile															
								Amosite															
								Crocidolite									F		W				
								Tremolite															
								Anthophylite															
								Actinolite									TR		10				90
14	19A	Material: joint compound Location: assoc. w/ 18A	O	WH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
15	19B	Material: ⊥ Location: assoc. w/ 18B	O	WH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

IPNA

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous	
16	20A	Material: 4" pipe TSI Location: Kitchen storeroom	25	WH	Y	F/P	Y	Chrysotile	15	W	∥	+	L	N	1.103	1.150								
								Amosite	5	NL	∥	+	M	N	1.694	1.679								
								Crocidolite										I						
								Tremolite																
								Anthophylite																
								Actinolite										20					60	
17	20B	Material Location						Chrysotile																
								Amosite																
								Crocidolite																
								Tremolite																
								Anthophylite																
								Actinolite																DNA
18	20C	Material Location						Chrysotile																
								Amosite																
								Crocidolite																
								Tremolite																
								Anthophylite																DNA
								Actinolite																
19	21A	Material: 6" pipe TSI Elbow Location: Hall outside Guidance	0	T ~~64~~ (cd)	Y	F/P	Y	Chrysotile																
								Amosite																
								Crocidolite										I						
								Tremolite																
								Anthophylite																
								Actinolite										50					50	
20	21B	Material Location	0	T ~~64~~ (cd)	Y	F/P	Y	Chrysotile																
								Amosite																
								Crocidolite										I						
								Tremolite																
								Anthophylite																
								Actinolite										40					60	

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ‖	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
21	21c	Material 6" pipe TSI elbow Location Hallway	0	T	Y	F/P	Y	Chrysotile															
								Amosite															
								Crocidolite										I					
								Tremolite															
								Anthophylite															
								Actinolite										40					60
22	22A	Material purple sink coating Location classroom 19	0	PK	Y	R	N	Chrysotile	10	W	II	+	L	N	1.53	1.00							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															90
23	22B	Material new addition purple sink coating Location work Room						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															DNA
24	22c	Material ↓ Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															DNA
								Actinolite															
25	23A	Material new addition carpet mastic Location work room	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100

Temp in Celcius = ____

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
26	23B	Material: carpet mastic Location: media center	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
27	24A	Material: new Addition cove base mastic Location: Room 29	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
28	24B	Material: ⊥ Location: Faculty RR	0	Y	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
29	25A	Material: black sink coating Location: classroom 1	0	BK	Y	T	N	Chrysotile	15	W	∥	+	L	N	1.0173	1.0162							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															85
30	25B	Material: ⊥ Location: classroom 8						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															

DNA

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
B1	26A	Material: gray sink coating Location: classroom 18	20	GY	Y	G R	Y	Chrysotile	20	W	∥	+	L	N	1.113	1.110							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															80
B2	26B	Material: L Location: Teachers staff Room						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															DNA
B3	27A	Material: Interior Door Frame caulking Location: classroom 7	0	MC	N	R H	N	Chrysotile	2	W	∥	+	L	N	1.113	1.110							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															98
B4	27B	Material: L Location: classroom 16						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															DNA.
B5	28A	Material: Interior Door Frame Caulking Location: Basement Exterior Door #6 Art Rm	0	T	Y	H	N	Chrysotile	2	W	∥	+	L	N	1.113	1.110							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															98

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
28	28B	Material: Interior Door Frame Caulking Location: Basement Exit Door #6 Art Room						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															
29	29A	Material: Flashing mastic Location: south wall above opening						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
			0	BK	Y	T	N	Anthophylite															
								Actinolite															100
30	29B	Material: Location:						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
			0	BK	Y	T	N	Anthophylite															
								Actinolite															100
31	30A	Material: Breeching Insulation Location: Boiler Room						Chrysotile															
								Amosite															
								Crocidolite													HB		
								Tremolite															
			0	BL	Y	F/P	Y	Anthophylite															
								Actinolite													10		90
32	30B	Material: Location:						Chrysotile															
								Amosite															
								Crocidolite													HB		
								Tremolite															
			0	BL	Y	F/P	Y	Anthophylite															
								Actinolite													10		90

DNA.

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
41	30C	Material: Breeching Insulation Location: Boiler Room	0	BL	Y	F/P	Y	Chrysotile															
								Amosite															
								Crocidolite													HB		
								Tremolite															
								Anthophylite													10		90
								Actinolite															
42	31A	Material: Endcap sealant Location: Boiler Room	0	Wt	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															100
								Actinolite															
43	31B	Material: L Location: L	0	Wt	Y	R	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															100
								Actinolite															
44	32A	Material: cement Endcap sealant Location: Boiler Room	0	Wt	Y	F/P	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite										40	10				50
								Actinolite															
45	32B	Material: L Location: L	0	Wt	Y	F/P	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite										40	10				50
								Actinolite															

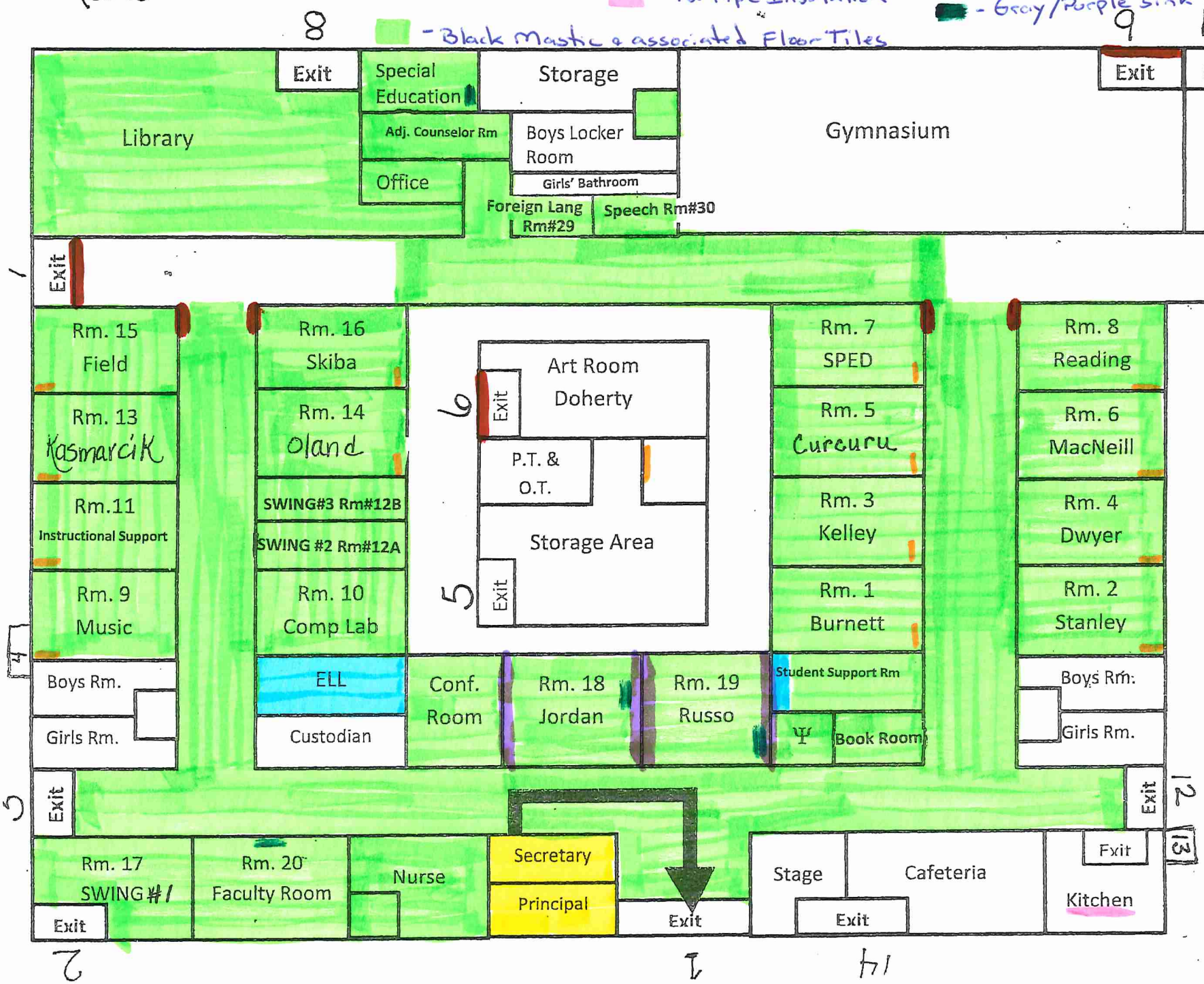
Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
46	33A	Material: additions pink gypsum wallboard Location: staff RR	0	T	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite											W				
								Tremolite															
								Anthophylite															
								Actinolite											2				98
47	33B	Material: Location: ~~Room~~	0	T	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite											W				
								Tremolite															
								Anthophylite															
								Actinolite											2				98
48	34A	Material: joint compound Location: assoc. w/ 33A	0	LH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
49	34B	Material: Location: assoc. w/ 33B	0	LH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
50	35A	Material: new addition grey gypsum wall board Location: Rm 29	0	MC	N	F GN	Y	Chrysotile															
								Amosite															
								Crocidolite									I		W				
								Tremolite															
								Anthophylite															
								Actinolite									2		20				78

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
51	35B	Material: new addition gray gypsum wallboard Location: Rm 30	0	MC	N	F/GN	Y	Chrysotile															
								Amosite															
								Crocidolite									I		W				
								Tremolite															
								Anthophylite															
								Actinolite									TR		50				50
52	36A	Material: joint compound Location: assoc. w/35A	0	WH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
53	36B	Material: ⊥ Location: assoc. w/35B	0	WH	Y	GN	Y	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
54	37A	Material: new addition 2x4 ceiling tile Location: staff RR	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite										40	40				
								Actinolite															20
55	37B	Material: ⊥ Location: Boys Locker Room	0	MC	N	F	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite										50	30				
								Actinolite															20

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = ____ Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
56	38A	Material new addition End cap sealant Location Gym	0	MC	N	H	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
57	38B	Material ⊥ Location addition Hallway	0	MC	N	H	N	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophylite															
								Actinolite															100
58	39A	Material new addition pipe TSI Elbow Location Gym	0	GY	Y	P	Y	Chrysotile															
								Amosite															
								Crocidolite										I					
								Tremolite															
								Anthophylite															
								Actinolite										30					70
59	39B	Material ⊥ Location Hallway	0	WH	Y	P	Y	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite										30					
								Anthophylite															
								Actinolite									(AN)	10					60
10918	39C	Material ⊥ Location storage	0	WH	N	F/P	Y.	Chrysotile															
								Amosite															
								Crocidolite										I	W				
								Tremolite															
								Anthophylite										25	15				60
								Actinolite															

Rev. 16

- 12"x12" Brown Floor Tile
- 9"x9" Red Floor Tile
- Joint Compound & associated gypsum wall board
- 12" Pipe Insulation
- Interior Door Frame Caulking
- Black Sink Sealant
- Gray/Purple sink Sealant
- Black Mastic & associated Floor Tiles



ZONE 1: Basement: Storage Areas, Boiler Room, and Art Room
ZONE 2: Cafeteria Area, West Wing Corridor (Classrooms 1 to 8)
ZONE 3: East Wing Corridor (Classrooms 9 to 16), Office Station Detector in Room 17, Custodial Office and Cafeteria
ZONE 4: Gymnasium, Library Media Center and Corridor