November 3rd, 2014

CLE BUILDING INSPECTION REPORT

Rendered To:

Mr. Domenic Tiberi
Sr. Project Manager
Compass Project Management

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Project: Alma Del Mar Charter School

Exterior Building Envelope Condition Survey

Report No.: ADM-01.10.24.2014
Inspection Date(s): 10.14.2014
10.15.2014
1.016.2014
Report Date: 10.24.2014

Dear Mr. Tiberi;

Please find CLE's findings report following onsite building envelope inspection of the ALMA DEL MAR Charter School in New Beford, MA on October 14th - 16th, 2014.

Site Address: 26 Madeira Ave., New Bedford, MA 02740

Structure Age: Constructed in 1908, (106 years old)

Environmental Conditions at Time of Inspection:

Day 1 – Tuesday October 14th, 2014	Day 2 – Wednesday October 15th, 2014	Day 3 – Thursday October 16th, 2014
Temperature Range: Mean 66° (60° - 75°) Skies: Clear Barometric Pressure: 29.90 in Relative Humidity: 82% Avg. Dew Point: 61° F Precipitation: 0.00"	Temperature Range: Mean 72° (66° - 78°) Skies: Clear Barometric Pressure: 30.90 in Relative Humidity: 83% Avg. Dew Point: 65° F Precipitation: 0.00	Temperature Range: Mean 66° (62° - 71°) Skies: Overcast Barometric Pressure: 29.83 in Relative Humidity: 94% Avg. Dew Point: 66° F Precipitation: 1.20"

**Environmental conditions noted for informational use only to confirm that conditions did not have a negative impact on the inspection and test results contained herein.*

Activities Conducted:

CLE conducted a limited visual survey of existing conditions relative to vertical wall and roofing assemblies at the Alma Del Mar project site. Non-invasive stucco sounding testing, Rilem tube moisture uptake tests, and location specific capacitance moisture meter surveys were conducted at interior and exterior envelope compartments manifesting potential problems relative to past and ongoing water intrusion. No invasive inspection or material removal was conducted, and certain aspects of the interior roof system inspection were limited by visibility. Wall, parapet and roof area calculations were made for material costing analysis, and digital photo documentation of specific envelope conditions was harvested.

Summary: (Approximately 24,000 feet floor area space, excluding Basement and Crawl Space).

Comparative baseline conditions for CLE's inspection were taken from Aubin's July 14th, 2013 inspection as well as FoleyBuhlRoberts structural report dated December 18th, 2013. Additionally, interviews with Mr. John Veenstra, Building engineer/Plant Manager, and Mr. Will Gardner, Executive Director were conducted during CLE's investigation.

Building Type: VB (Non-Combustible/Combustible)
Exterior Shell: Mass constructed masonry wall system – Terra cotta with Stucco finish.
Roof: Tar and gravel. Internal drain system, two valleys and elevated gymnasium roof over main structure.
Chimney: mortar tucked masonry units with kick out flashing at base.
Parapet System: Masonry/Framed. Projected cantilevered parapets at rear of building (XXX Elevation).
Parapet Flashing: Copper break-shape cover cap assembly.
Apron System: Wood framed aprons with asphalt impregnated paper under clay tiles.
Retaining walls: Concrete.
Windows: New replaced Aluminum Retrofit Windows.
Exterior Coatings: Latex paint

Summary of as Found Conditions:

CLE performed a topical visual survey of Alma Del Mar's exterior envelope system and identified multiple areas and conditions which require maintenance, repair, and/or rehabilitation. The following table demonstrates the primary exterior conditions which were evident upon visual canvasing of the exterior envelope system.

No.	Description of Exterior Condition:
1	Wall Surface Coating Breakdown - Paint Peeling, Cracking, and Delaminating.
2	Extensive Stucco Cracking.
3	Sub-Surface Delamination of Stucco in Wall Fields.
4	Surface Spalling of Stucco/Masonry at Foundation Locations
5	Complete Stucco Collapse in Parapet Wall System at Cantilevered Roof Projection.
6	Perimeter Window System - Adhesive Sealant Failure
7	Perimeter Window System - Cohesive Sealant Failure
8	Cracked Tiles at Apron Roof Systems
9	Torn / Degraded Asphalt Impregnated Roofing Paper Under Apron Tile System
10	Flashing Sealant Failure – Cohesive and Adhesive Failure at Flashing Seams at Parapet System.
11	Rust and Corrosion Breakdown of Parapet Cap Flashing Metals.
12	Exposed Parapet Cavities where Flashing Metals are Missing/Removed.
13	General Roof Membrane Coating Breakdown Due to Aging.
14	Voids, Apertures, and Open Delamination Portals of Roofing Membrane System at Transitions.
15	Isolated Instances of Ponding Water at Roof Drain Areas.
16	Fascia Degradation and Separation at Gymnasium Roof Perimeter.
17	Concrete Breakdown at Sidewalks and Entry Walks.
18	Separation of Miter Seams at Metal Chimney Flashing

The exterior enclosure of Alma Del Mar can be viewed as a six sided box. Vertical walls form four sides, the roof another, and the basement floor and subterranean foundation system another. The largest weather exposed envelope areas are comprised of the vertical wall and roofing surfaces. Due to age, exposure, and lack of restorative maintenance, a high degree of breakdown and advanced life-cycling is evident in these two regions.

Buildings with extensive age pose a challenge relative to asset management. It is anticipated that ongoing breakdown of exterior components will naturally occur due to normal life-cycling of materials. However, to protect property investment and to maximize the functional service life of the exterior envelope system, it is critically important that the building owner engage in timely preventative and restorative maintenance when required. A large part of a viable, well thought out maintenance program includes continual vigilance in identifying and eliminating sources and water intrusion. Delaying repairs typically results in increased remediation costs.

It is important to realize that although some conditions of material and component degradation are natural and inevitable due to normal material life cycles and system aging, certain topical conditions, left unaddressed, can result in much more serious secondary damage to underlying components and systems.

As an example, let's first look at the Alma Del Mar Exterior Wall System: (Terra Cotta with Stucco Finish)

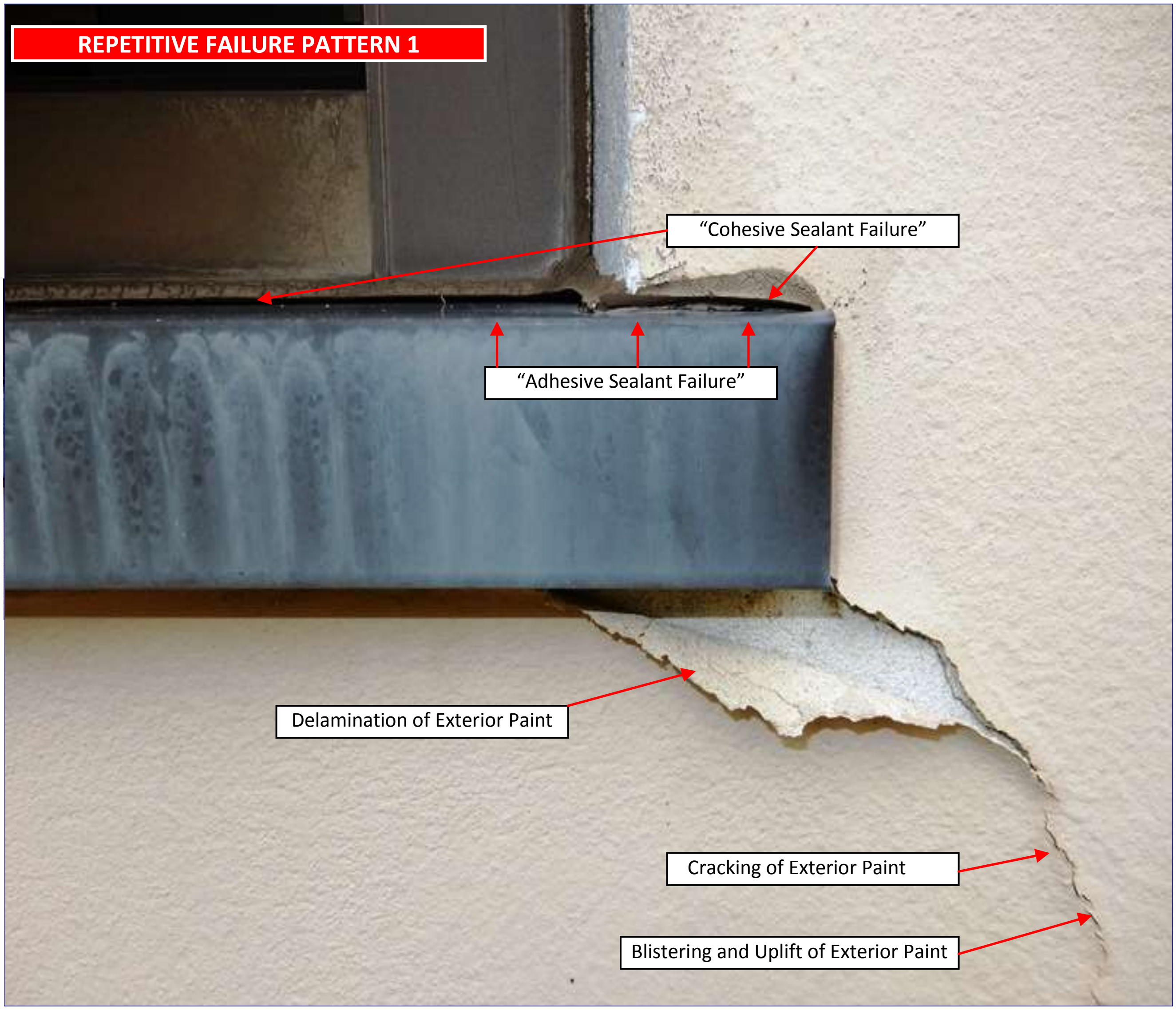
The exterior wall's stucco system shows signs of normal aging and has experienced anticipated life cycle breakdown associated with a 100 year old finish system. The stucco system contains topical conditions which include small, medium, and large size crack systems. These crack systems, while perfectly normal, are also susceptible to moisture uptake, and if left untreated, further facilitate degradation of the finish system through freeze-thaw damage and spalling. Downstream secondary consequences can be much more serious, leading to sub-surface delamination of the stucco from the internal masonry structural system.

The surface coating's crack systems in the paint and stucco are not merely aesthetic blemishes. The painted surface coatings have limited low modulus properties (Elongation and Elasticity) and are highly susceptible to rupture. Once ruptures occur, cracking, peeling, blistering, and delamination of the protective skin or shell which forms the protective layer of the exterior surface barrier is accelerated. Invisible inward water migration is facilitated, and this further accelerates sub-surface wetting and additional moisture uptake. Cooling and heating bring expansion and contraction, and ongoing, unmitigated moisture uptake results in secondary damage which includes delamination of the stucco layer from the interior masonry structural wall system.

While cracking stucco and peeling paint seem relatively benign at first glance, over time, this can lead to complete breakdown of the stucco system due to degradation of adhesive bondlines through delamination.

One benefit of age, and perhaps the only benefit, is that the time for differential movement due to building settling has come and gone. Differential movement still occurs though through the expansive and contractive forces associated with freeze-thaw, and delamination of bondlines through ongoing water penetration and cyclical moisture uptake. Moisture uptake can be extremely harsh on masonry systems due to mineral leeching which result in the structural degradation of the mortar system.

While the previous photo is alarming, CLE's inspection found that there are other, less conspicuous failure patterns and conditions occurring within the vertical wall systems which repetitively manifest themselves and involve the same components and area locations.



The above photo demonstrates a primary repetitive failure pattern found at the Alma Del Mar project site. The pattern contains:

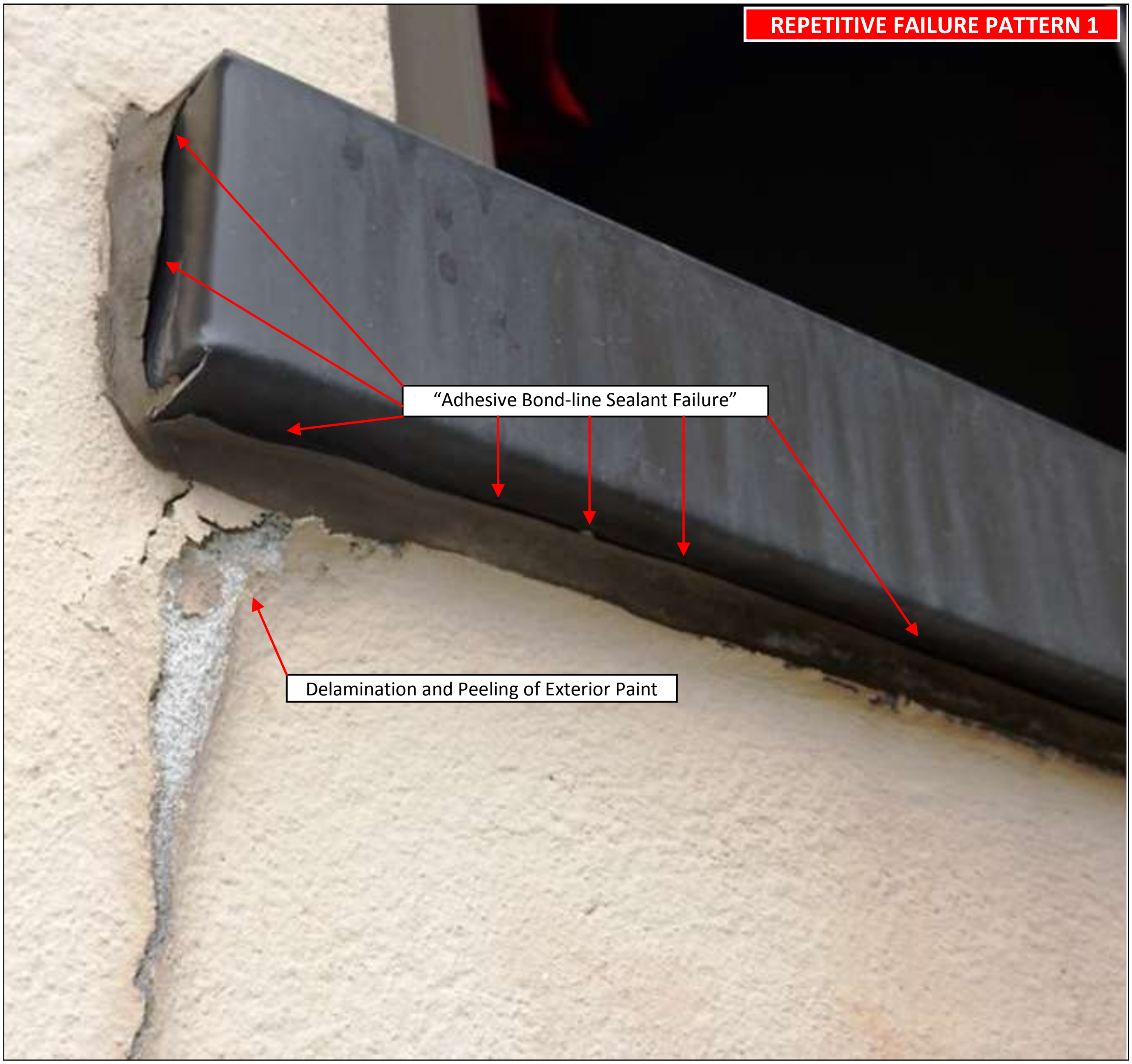
1. Radial cracking of stucco at the corners of punched openings.
2. Adhesive Bond-Line Sealant Failure.
3. Cohesive Sealant Failure.
4. Flaking, Peeling, Blistering, & Delaminating Paint.

All of these conditions will continue to occur, and water intrusion exacerbated, without timely repair and maintenance.

The above photo shows the same repetitive failure conditions, all of which stem from interface failure of dissimilar materials – caused by direct material failure and moisture uptake. These conditions are widespread and clearly evident, and they create an exterior envelope condition which is highly susceptible to water penetration.

Maintenance must be undertaken to ensure that the exterior building skin maintains continuity between dissimilar materials. Materials must be correctly selected for each application, and they must be installed in the proper manner to achieve functional service life. Although relatively new aluminum retrofit windows have been installed, the perimeter sealant conditions documented above are capable of allowing water migration into interior wall regions.

Left unmitigated, these conditions will continue to accelerate breakdown of an already aged and failed envelope system.



Moving outward from the punched opening into the stucco wall fields, an advanced capillary system exists that contains small, medium and large size cracks. CLE performed RILEM tube moisture uptake tests and verified that significant water penetration is occurring through the capillary systems in the wall fields. This was documented with video, and the “clips” will be made available as a media addendum to this report.

As the migration of water continues inward to sub-surface layers, ongoing damage can become invisible to the casual observer. Moisture uptake and “stucco sounding” tests however indicate that the stucco system has multiple wall areas which are delaminating and in advanced states of sub-surface bond-line failure.

An explanation of how Rilem tube analysis is performed is available on the following page.

Delaminating paint allows water to migrate past the surface coating system. Once the outer layer of the building skin has been peeled back, water also has access to the capillary systems in the stucco. Penetrating water begins an invisible migration inward. Over time, moisture build up will continue to occur and often becomes excessive, delamination of the sub-surface stucco layers take place, and system breakdown is accelerated.

Invisible Damage Not Seen

Visible Damage Evident

Relative to the newer windows, the perimeter caulking system is manifesting severe cohesive and adhesive failure. It is currently unknown why the sealant material has lost the majority of its low-modulus properties so quickly. However the systemic adhesive failures are most likely due to a combination of factors which include:

1. Differential movement of substrates; (expansion and contraction of substrates)

2. Accelerated life-cycle breakdown of the sealant results in loss of modulus. Once lost, the beneficial performance properties and material characteristics of the sealant are nullified.

3. Improper surface preparation at time of installation. (Failure to obtain clean, high integrity bondlines).

To maintain a high degree of water penetration resistance at critical transition areas, such as the perimeters of thru-wall penetrations, the sealant system must remain soft and pliable, and most importantly, tenaciously adhesive.

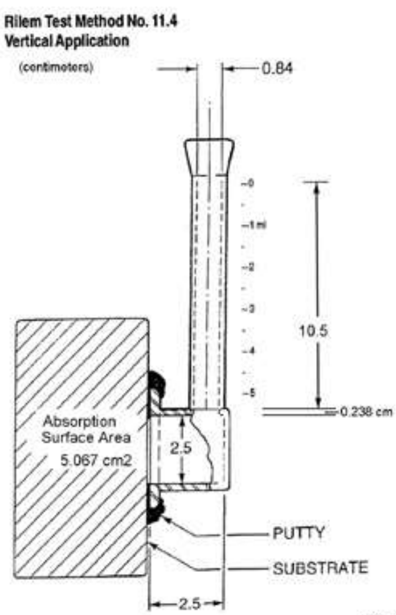


Figure 1

CLE conducted Rilem tube tests on multiple stucco locations which showed signs of small, medium, and large surface cracks.

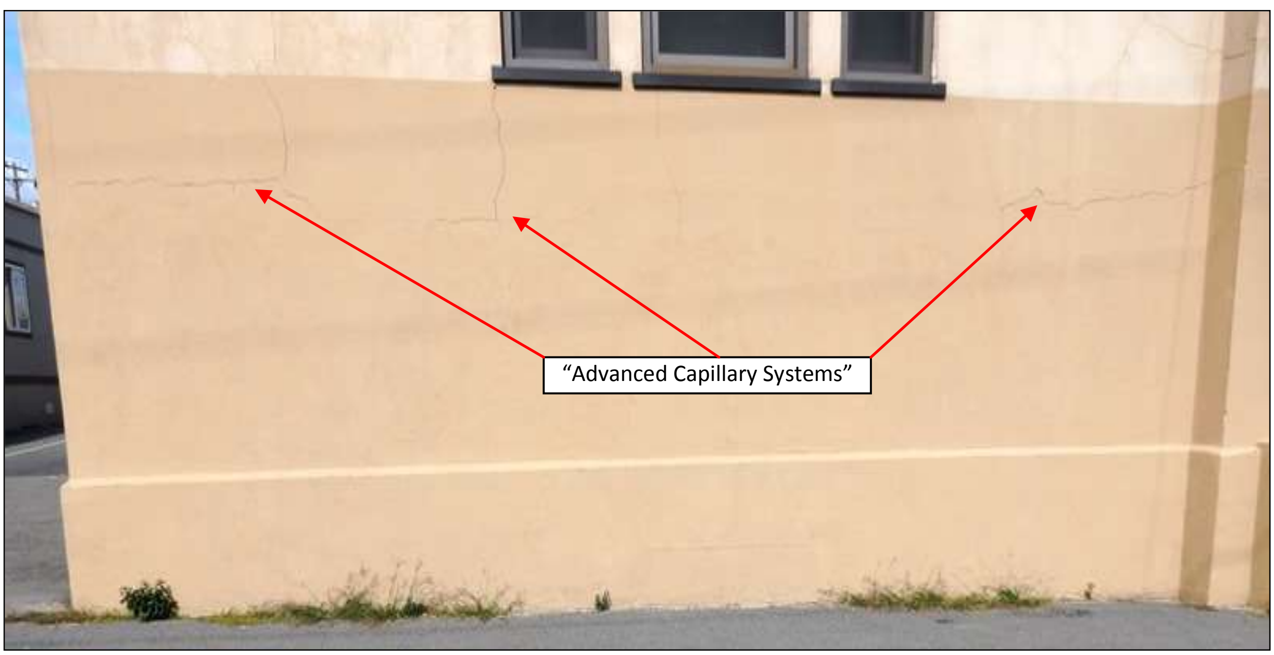
Rilem testing verified that the capillary systems run deep and that they are capable of actively transporting water to inner layers of the exterior wall system. It is suspected that the capillary systems are contributing to sub-surface delamination of the stucco system, and subsequent sounding tests verify that hidden damage has occurred.

"…The RILEM tube test was adopted in the United States in the early 1980s by the water repellent manufacturing industry to assess water absorption properties of walls and other substrates, with or without treatment. Simply put, the test measures the quantity of water absorbed by a particular substrate over a given time through an uptake tube. The uptake tube is sealed to the substrate with putty…"

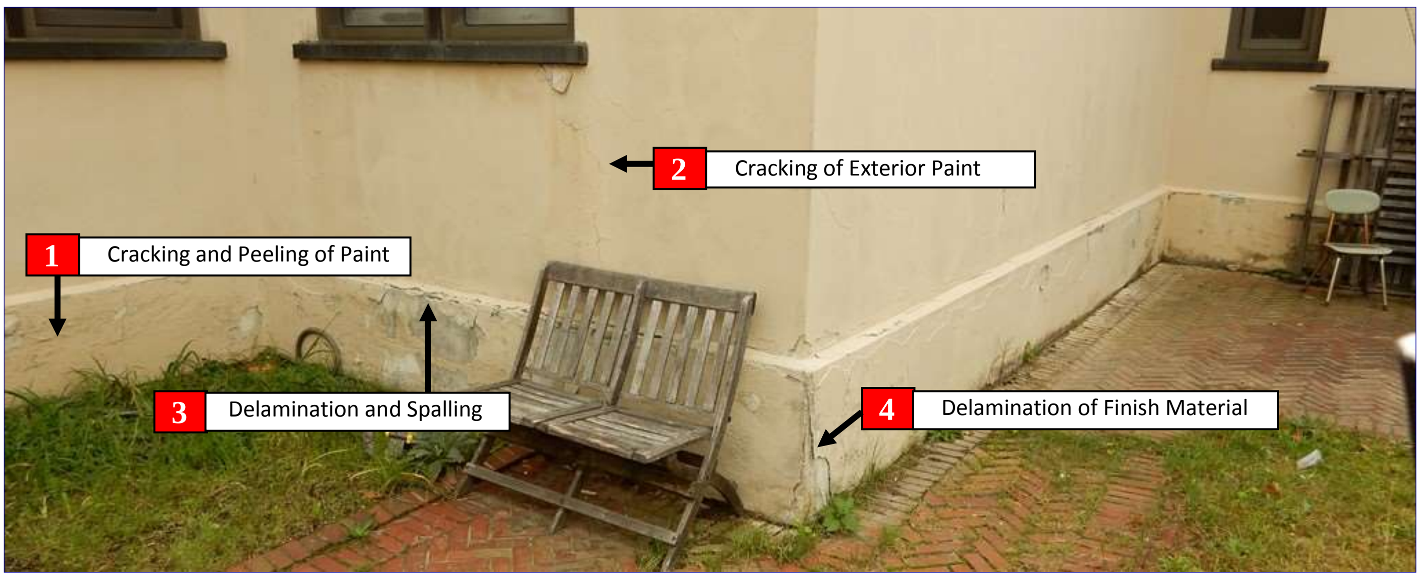
"…The hydrostatic head developed by the column of water in the tube can be correlated with wind-driven rain of a certain speed. This relationship is not linear; pressure is proportional to the square of velocity, so the wind speed per 1 ml (0.04 oz) of water at the bottom of the tube is about twice that at the top of the tube.."

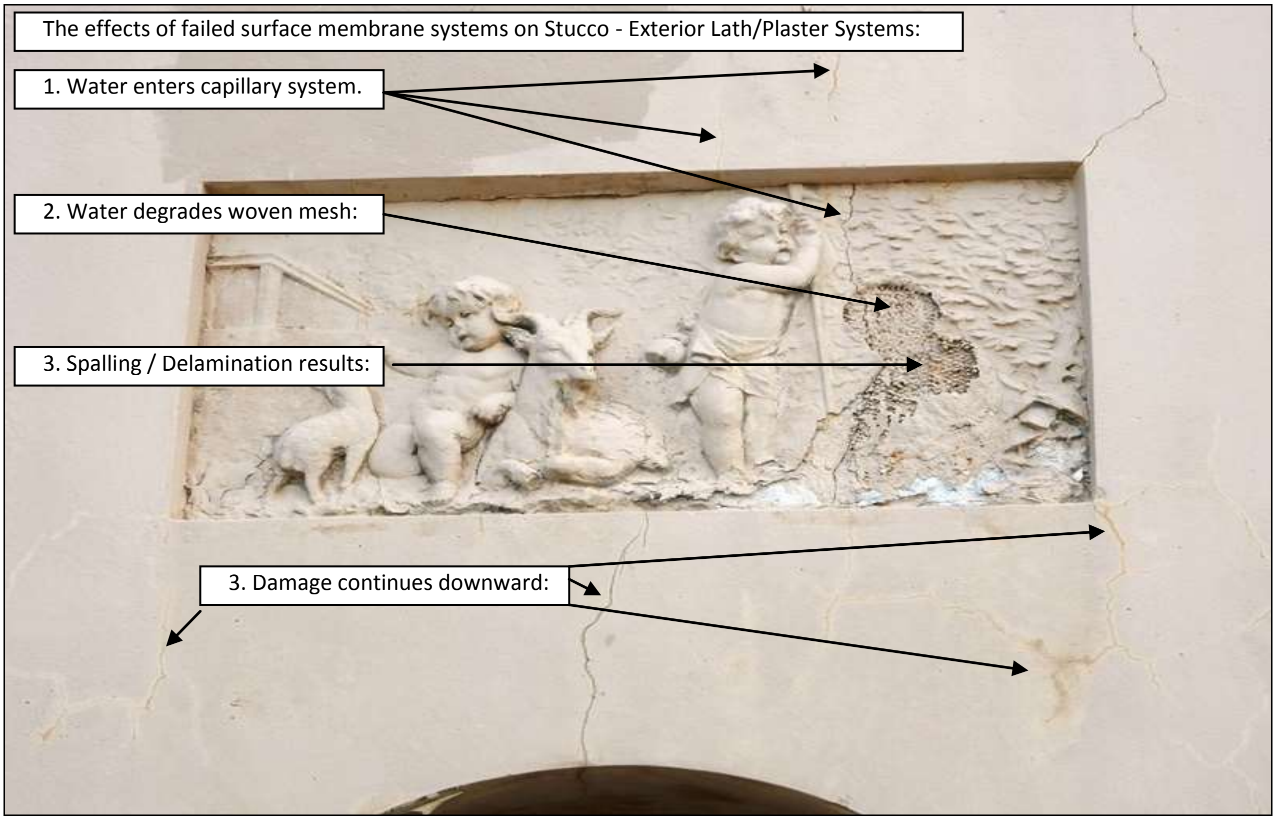
Excerpt from www.constructionspecifier.com

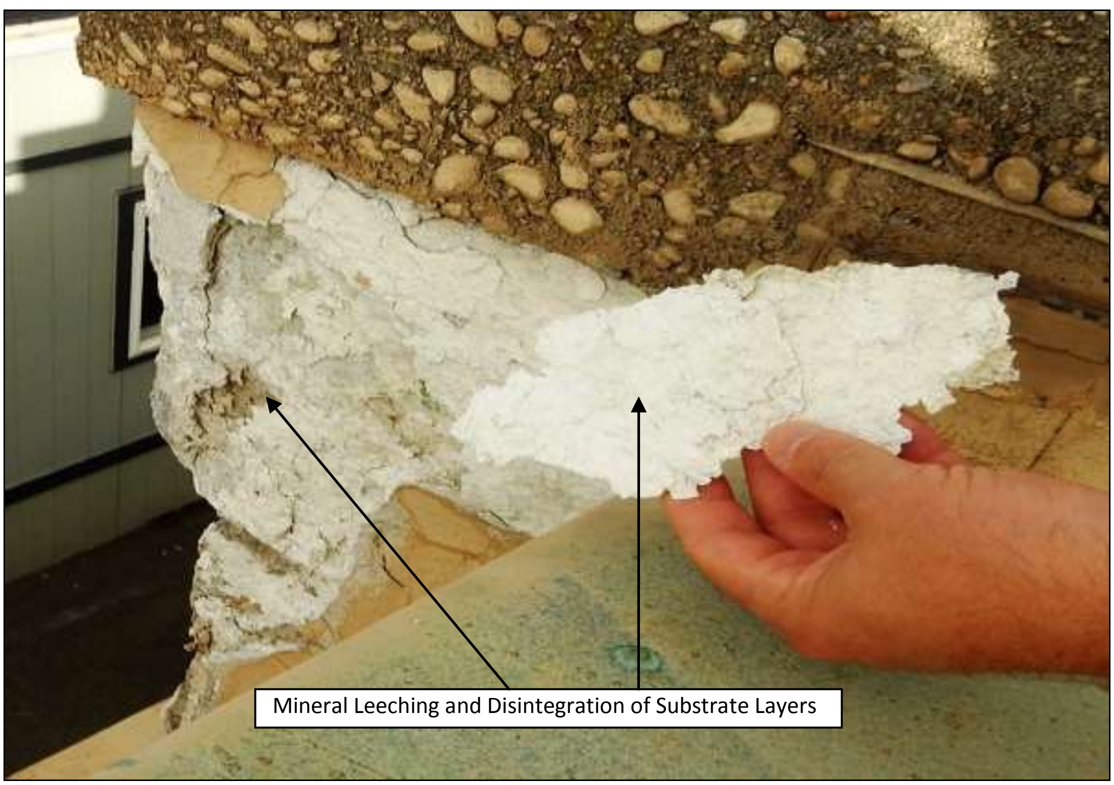
Rilem Tube Testing indicated immediate uptake and transport of water to the interior side of stucco system. Sounding of the stucco system indicates multiple pockets of delamination at interior layers. If ongoing water intrusion remains unchecked, these regions will remain vulnerable to further breakdown and experience increased susceptibility to collapse and separation from the interior structural wall assembly.



Examples of compounding surface conditions from moisture uptake and water penetration past surface layers.




The effects of failed surface membrane systems on Stucco - Exterior Lath/Plaster Systems:
1. Water enters capillary system.
2. Water degrades woven mesh:
3. Spalling / Delamination results:
3. Damage continues downward:


Mineral Leeching and Disintegration of Substrate Layers

The basic water infiltration damage patter affects the foundation walls in the same manner:

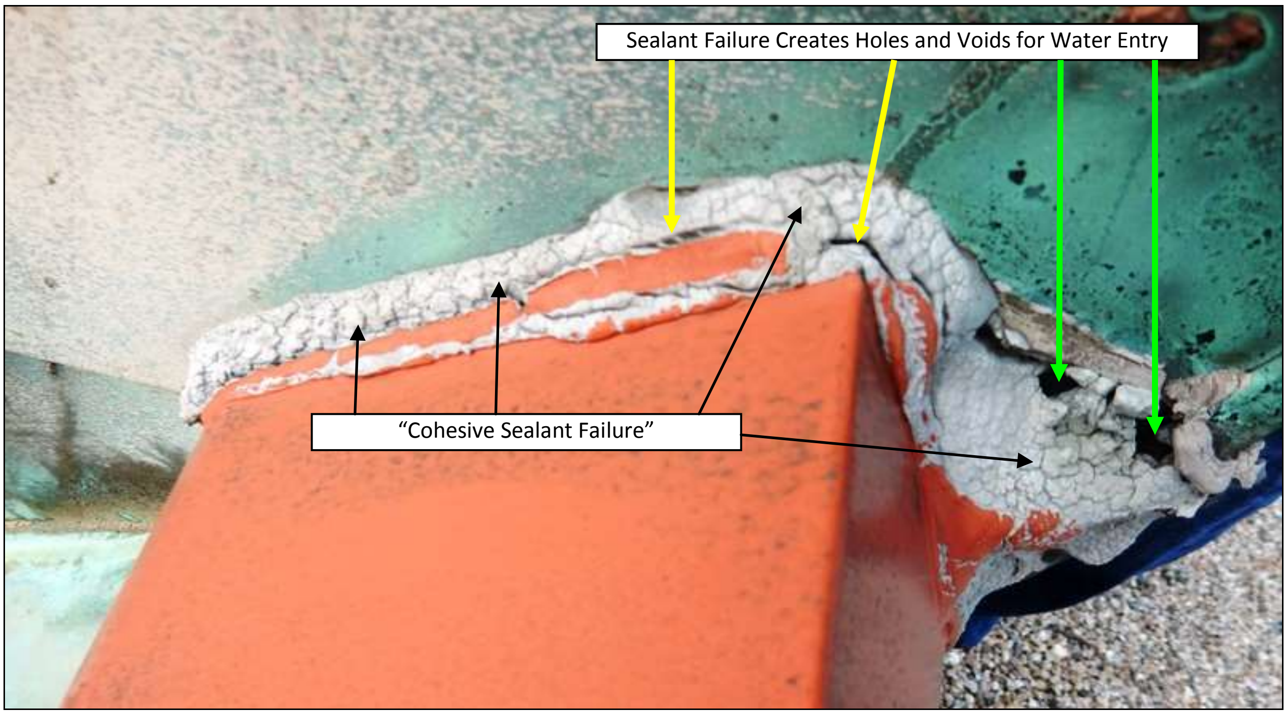
From the Top to the Bottom of surface layer protected buildings, unchecked and unmitigated water intrusion will result in substantial surface and sub-surface breakdown of finishes and components.

Alma Del Mar remains in immediate need of restorative maintenance to prevent further breakdown and degradation of the exterior envelope. The risk of stucco separation from the interior masonry wall's structural system will increase over time.

Along with the visibly apparent issues associated with the vertical wall and foundation systems, the apron, parapet, sealant, parapet flashing, and roofing membrane systems manifest failure conditions ranging from isolated to systemic. The following photos communicate typical conditions found at the top of the building.

Note that the ongoing condition of the parapet system will be of critical importance. Any work performed which is intended to remediate the vertical wall's stucco or surface coating system will be contingent upon the apron and parapet's cap flashing system's ability to deter any and all water migration to interior side of repaired areas.

Vertical Wall to Roof Transition System Conditions:



Multiple Areas of Missing and/or Damaged Interior Parapet Skin

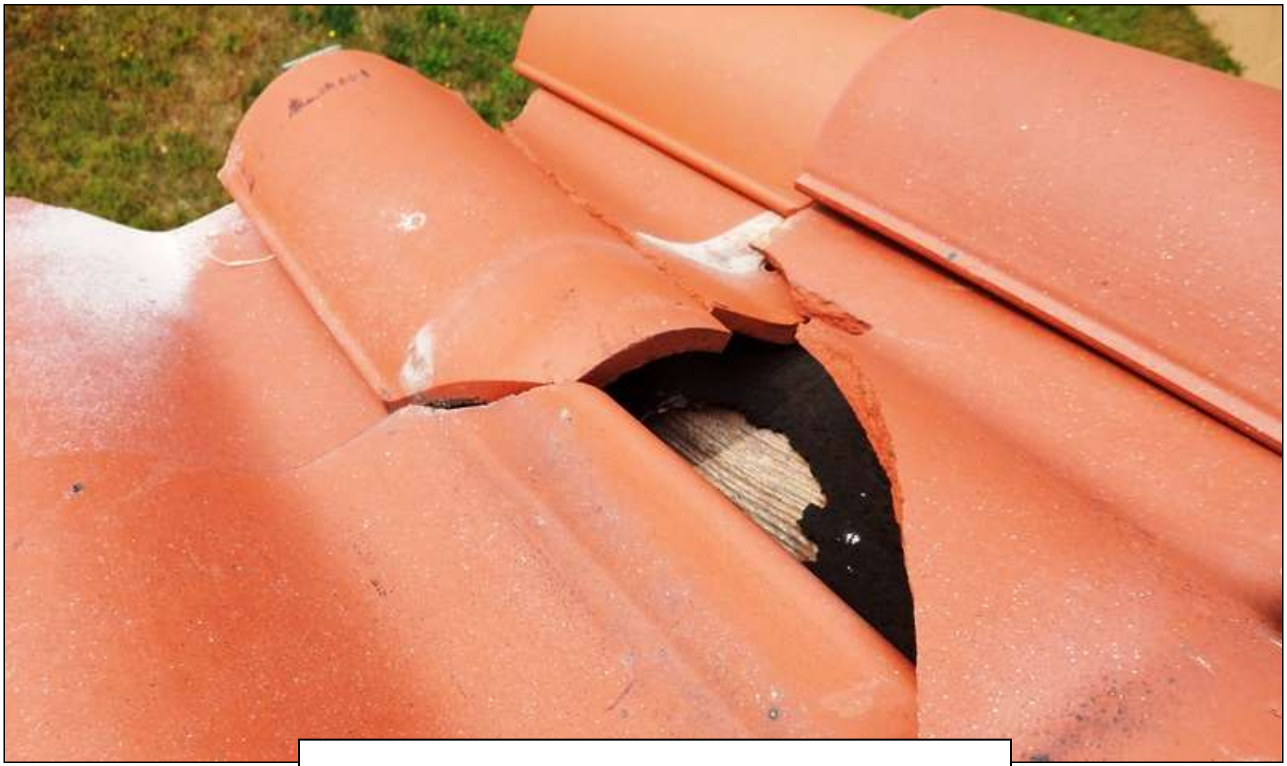
Multiple Areas of Missing and/or Damaged Interior Parapet Skin.
These Regions Create Direct Paths for Immediate Water Entry

Multiple Areas of Advance Material, System and Transitional Interface Breakdown and/or Failure. Area of extremely high vulnerability to water penetration failure.

Water Entry Paths Behind Roof Membrane System are Evident and Readily Accessible To Water Intrusion.
Verification of Substrate Material Composition Recommended Prior to Remediation / Disruption.
Repairs may Require Non-Invasive / Non-Disruptive Encapsulation Strategies, Abatement and/or Utilization of PPG.

Parapet Metal System in Advanced State of Material Degradation

Apron Roof Tile & Asphalt Impregnated Tar Paper System:



Broken Tiles and Exposed WRB Tar Paper Exist in Some Areas

The apron system utilizes a simple dimensional T&G decking system cantilevered on a beam and corbel system. The tile rests upon and is attached to a plywood substrate sheathing assembly. The WRB for the apron assemblies include asphalt impregnated tar paper positioned underneath interlocking clay “Monier Style” contour tiles.

There are areas where the tiles are damaged and the WRB’s tar paper is torn and the underlying plywood substrates are exposed. Some surface decay of the plywood and decking are evident.

Repairs will be needed to mend the WRB and maintain water resistivity.

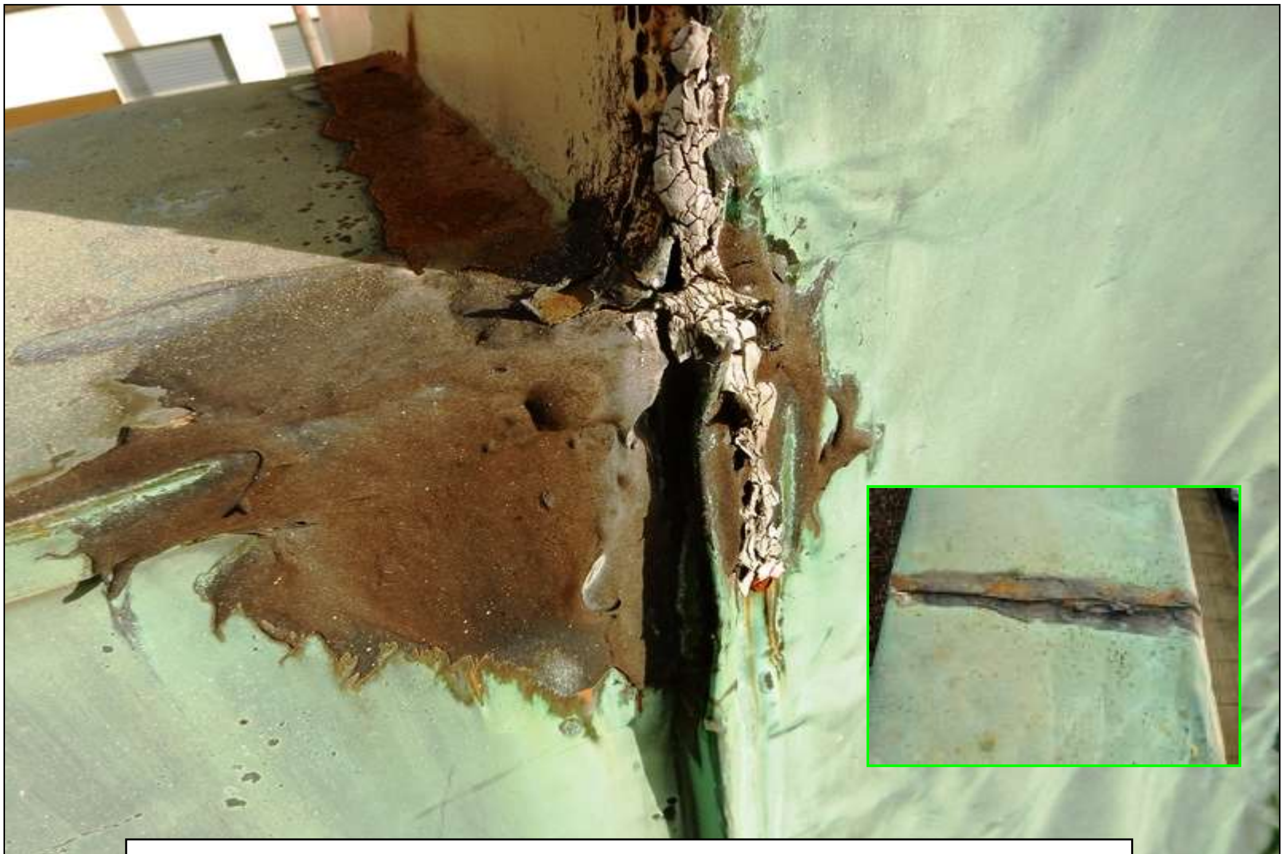
The Gravel and Tar Roof system is older and aged as well. The field of the roof appears to still be serviceable. Terminations, interfaces, and transition areas of the membrane system show advanced breakdown and in some cases, direct portals for water entry. The following photos show many conditions documented during the course of CLE's condition inspection.

The Field of the Gravel & Tar Roof System Appears Serviceable

Transition Materials and Interface Areas Are Vulnerable Due to Breakdown and General Aging

Transition Areas Are Vulnerable Due to Breakdown and May Provide Pathways for Water Entry

Transition Areas Are Vulnerable Due to Breakdown and May Provide Pathways for Water Entry



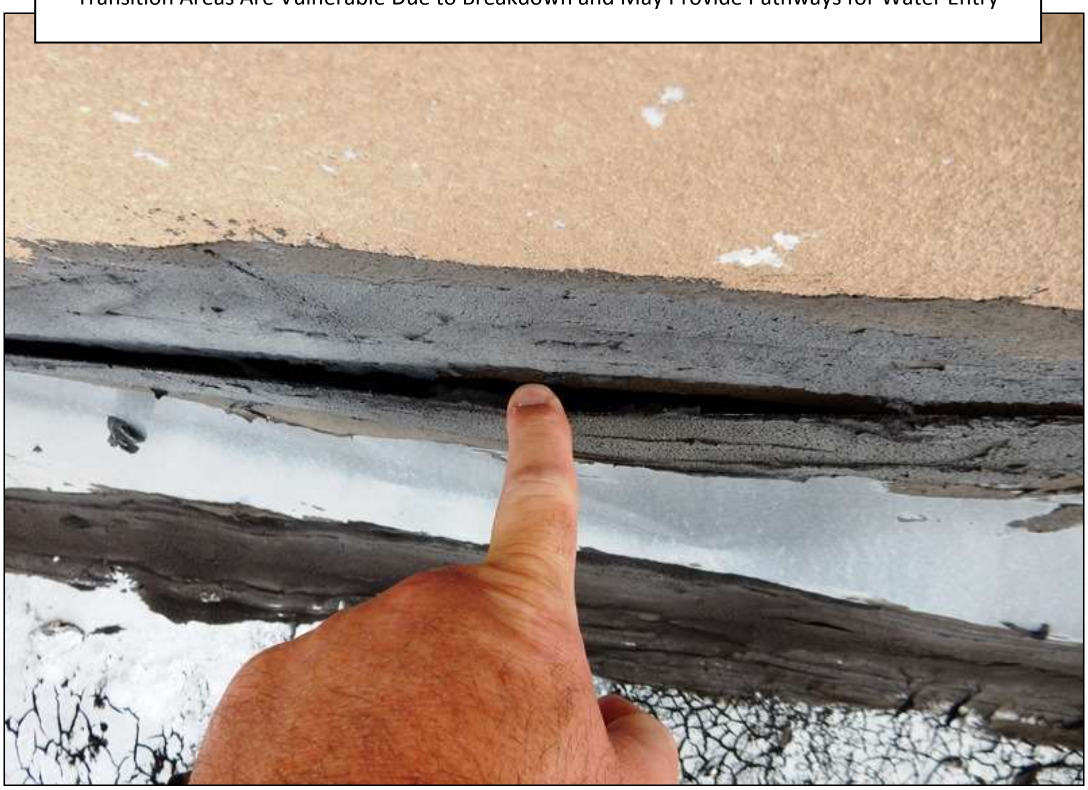
Transition Areas Are Vulnerable Due to Breakdown and May Provide Pathways for Water Entry

The stucco system at the roof has capillary systems which have allowed water and moisture uptake. Rust and corrosion of interior components is evident in the form of surface discoloration.

Water gaining access to the interior side of the stucco system may be migrating underneath the roofing membrane system as well.

These areas require attention to ensure that no further damage occurs and that vulnerability to water penetration is eliminated.

Transition Areas Are Vulnerable Due to Breakdown and May Provide Pathways for Water Entry



This photo shows an example of water intrusion through material and transitional interface failure. The photo below shows a moisture meter reading detecting elevated moisture content in the structural framing members located below the leak area.

More examples of topical conditions that show advanced material, component, and system breakdown. The fascia coatings have deteriorated and the wood fibers have sustained damage. The corner joints have swollen, and water penetration behind the fascia is most likely occurring. In the top two photos, stucco and membrane coating damage is evident.

Ponding water by roof drain accelerates membrane breakdown

Although mortar condition and tuck-pointing bond-lines appear serviceable, separations in miter system of kick-out flashing are evident and may allow water behind upturned roof membrane termination.

Transition Areas Are Vulnerable Due to Breakdown and May Provide Pathways for Water Entry

Sidewalk System:

The concrete sidewalk system also manifests damage and breakdown, and the above photo shows an area that poses a trip-hazard and potential life-safety issue.

Conclusions and Recommendations:

The Alma Del Mar structure's exterior envelope system has several areas which require immediate attention to maintain serviceability and minimize further damage and deterioration. The photos enclosed in this report identify the type of materials and conditions which should be given consideration when engaging in short and long-term maintenance, repair, and restorative planning.

Based upon the current findings, CLE recommends that Alma Del Mar officials:

1. Identify funding availability and determine limitations relative to engaging in any or all of the following potentially available repair strategies. Based upon funding capacity, strategies include:

    a. Making surgically targeted, limited emergency repairs to distressed areas which currently have the highest vulnerability to water penetration. This would involve isolated repairs and would address only those identified high risk areas which currently have present, ongoing envelope defects.

b. Develop a remediation plan and subsequent costing analysis for undertaking repairs to each of the four primary envelope compartments which are in need of restoration:

   i. Entry approaches.
   ii. Vertical Wall Systems.
   iii. Parapet Wall and Cap Flashing System.
   iv. Tile Aprons and Main Roof System.

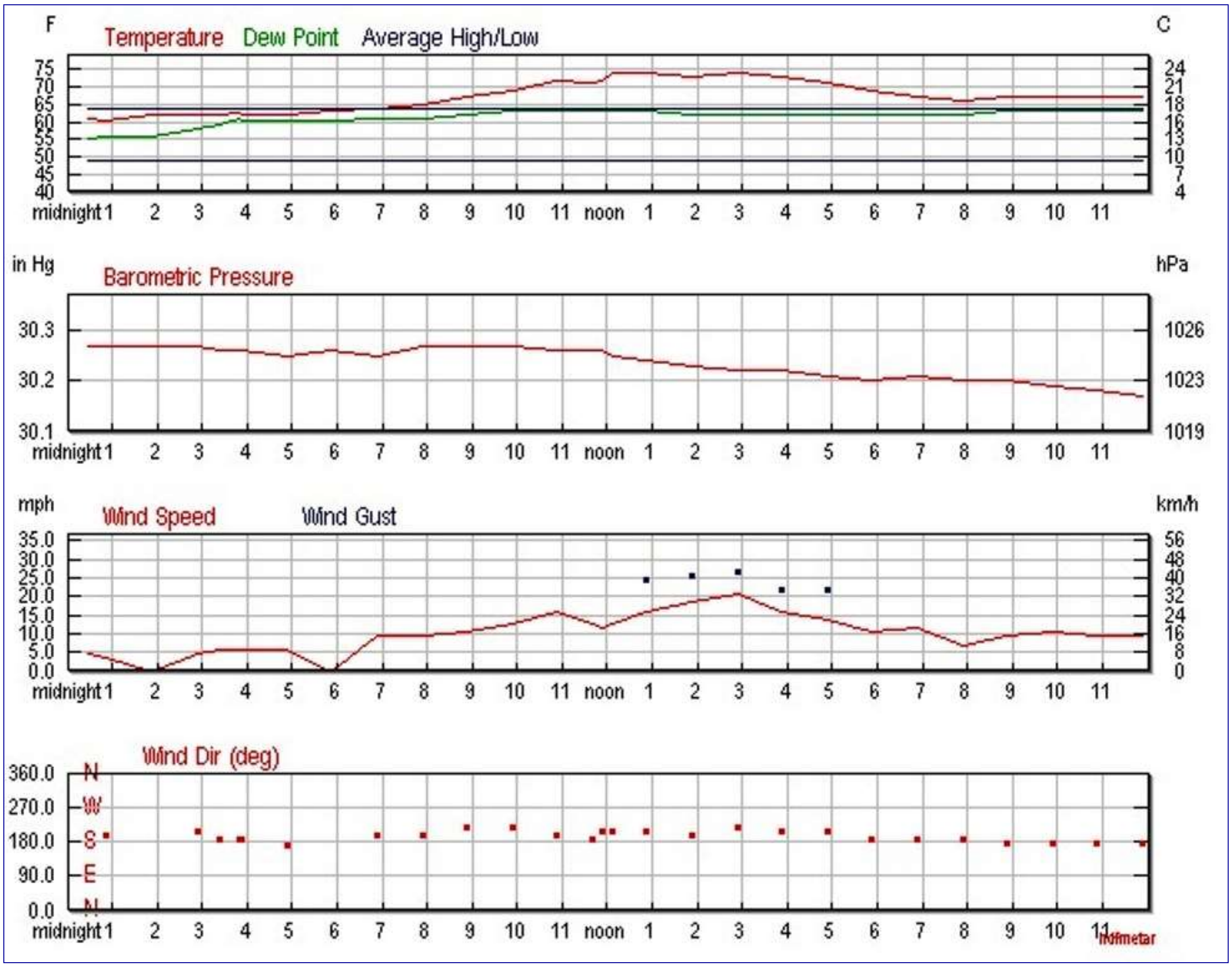
   Based upon the availability of funds, determine the extent of repairs which are capable of being funded and commissioned in any or all of the four identified envelope compartments. This should include prioritization of the compartments based upon degree of repairs needed and corresponding risk of potential damage. Limited funds should be applied to compartments on the basis of priority in an effort to eliminate the most problematic conditions and receive the highest ROI.

2. Engage in a small scale repair mock-up which would include 20 – 30 lineal feet of exterior envelope system. This would allow potential repair methods to be implemented and evaluated for effectiveness, economy, and aesthetic results. This is often a highly valuable process since it provides the opportunity to engage qualified 3rd Party contractors in a limited manner and helps secure accurate pricing. Once the limited mock-up area has been rehabilitated, it can be thoroughly evaluated for aesthetics, and it can even be vetted by performance testing to determine water penetration resistitivity.

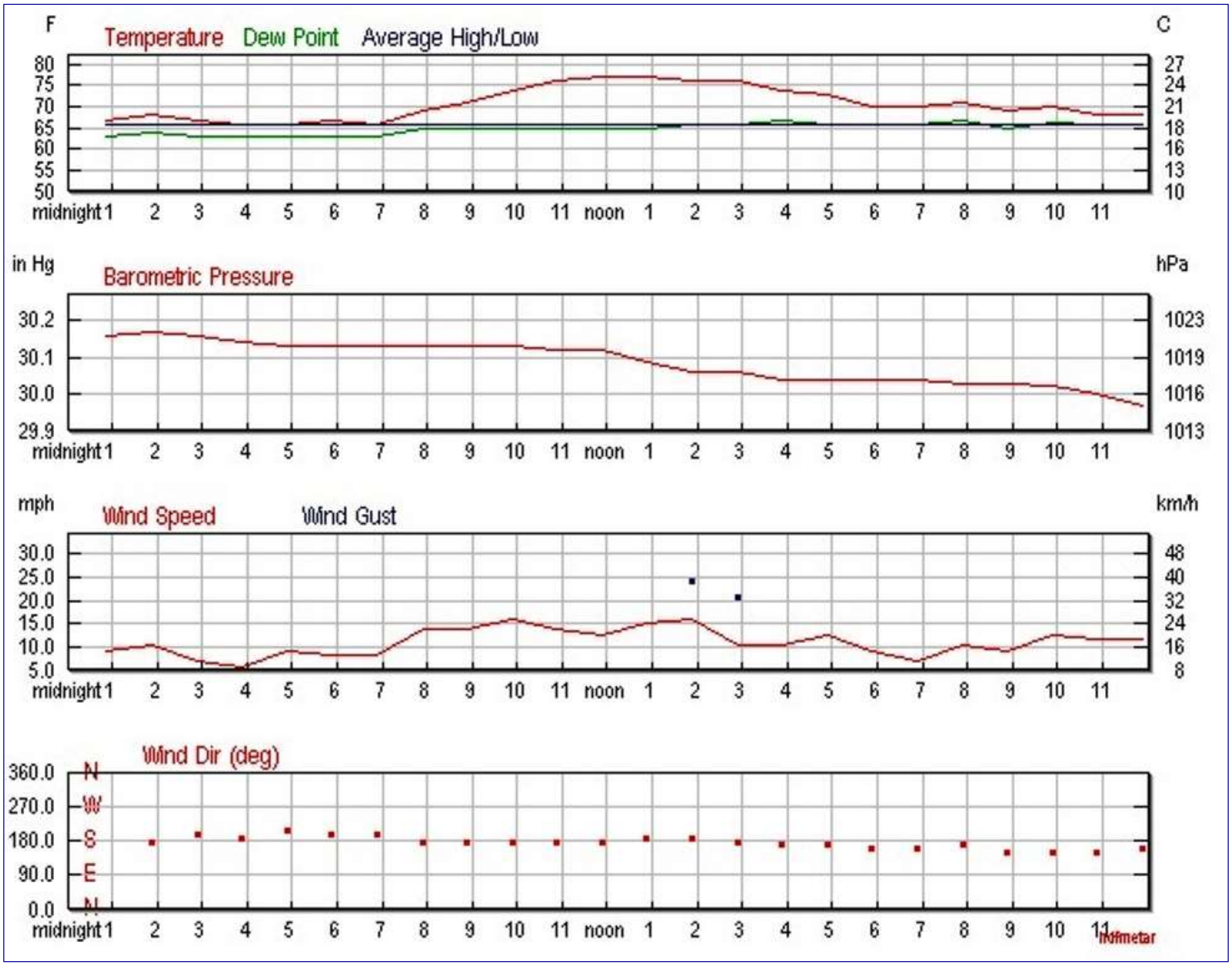
CLE is available to assist Alma Del Mar in preparing an emergency repair and/or restoration plan. CLE can also develop a repair protocol and manage implementation and QA/QC if a limited mock-up is decided upon.

CLE appreciates the opportunity to be of service. This completes the findings report for our Exterior Envelope Condition Survey at the Alma Del Mar project site. Please call at your convenience if you have any questions, or if we can be of additional service.

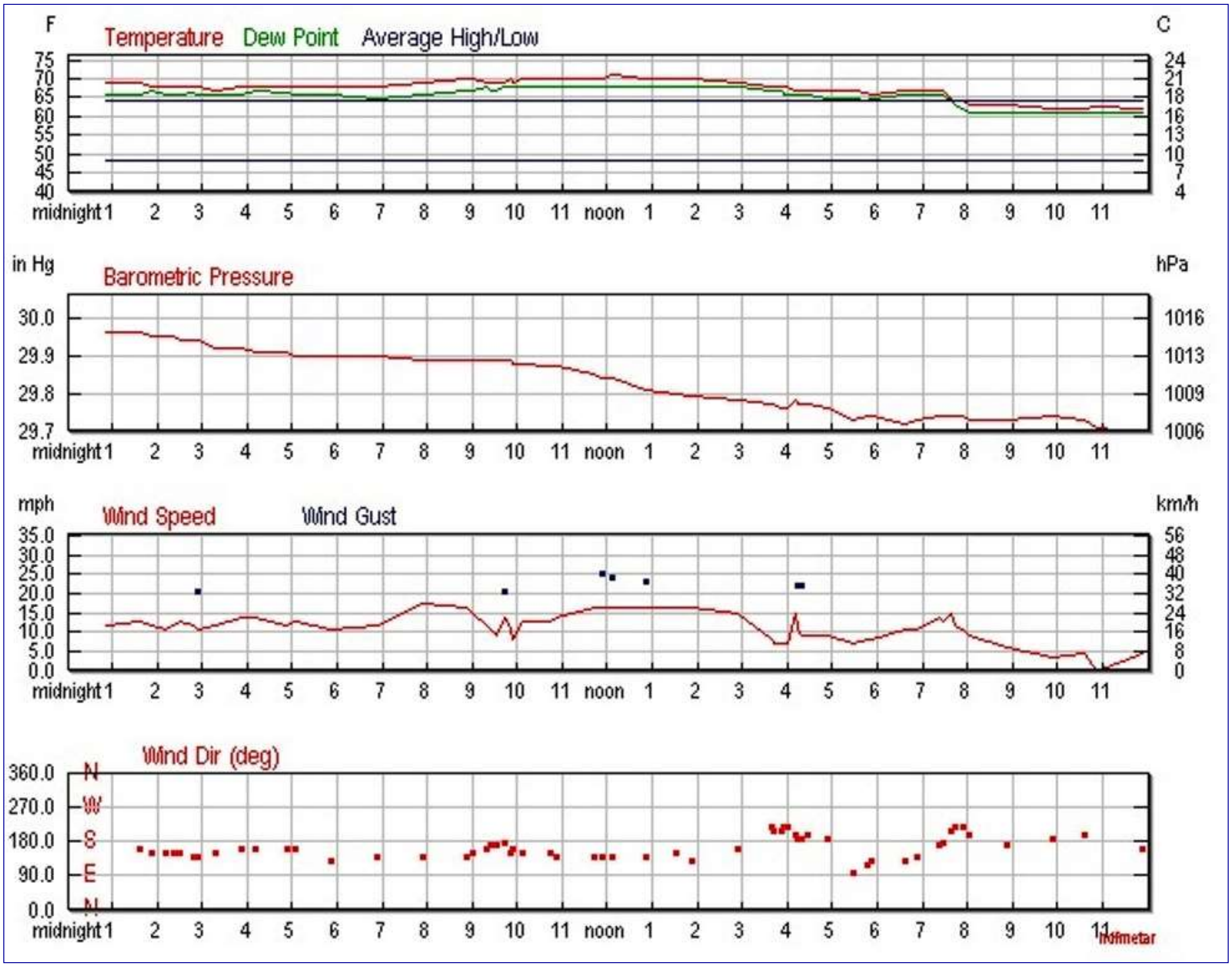
Environmental Conditions Day 1



Environmental Conditions Day 2



Environmental Conditions Day 3



FINAL REPORT
FOR
HAZARDOUS MATERIALS IDENTIFICATION
SURVEY
AT THE
ALMA DEL MAR CHARTER SCHOOL
NEW BEDFORD, MASSACHUSETTS

PROJECT NO: 214 371.00

SURVEY DATES:
December 13 & 16, 2014

SURVEY CONDUCTED BY:

UNIVERSAL ENVIRONMENTAL CONSULTANTS

UEC universal environmental consultants

December 18, 2014

Mr. Will Gardner
Executive Director
Alma Real Estate, QALICB
26 Madeira Street
New Bedford, MA 02746

Reference: Report for Hazardous Materials Identification Survey
Alma Del Mar Charter School, New Bedford, Massachusetts

Dear Mr. Gardner:

Thank you for the opportunity for Universal Environmental Consultants (UEC) to provide professional services.

Enclosed please find the report for Hazardous Materials Identification Survey at the Alma Del Mar Charter School, New Bedford, Massachusetts.

Asbestos inspection was performed by a Massachusetts licensed asbestos inspector Mr. Leonard Busa (AI-030673).

Please do not hesitate to call should you have any questions.

Very truly yours,

Universal Environmental Consultants

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Ammar M. Dieb
President

UEC:\214 371\REPORT.DOC

Enclosure

1.0 INTRODUCTION:

Universal Environmental Consultants (UEC) has been providing comprehensive asbestos services since 2001 and has completed projects throughout New England. We have completed projects for a variety of clients including commercial, industrial, municipal, and public and private schools. We maintain appropriate asbestos licenses and staff with a minimum of fifteen years of experience.

UEC was contracted by Alma Real Estate, QALICB to conduct a determination survey at the Alma Del Mar Charter School, New Bedford, Massachusetts for the following:

- Accessible Asbestos Containing Materials (ACM);
- Lead Based Paint (LBP);
- Polychlorinated Biphenyls (PCB's)- Electrical Equipment and Light Fixtures;
- PCB's in caulking.

The scope of work included the inspection of accessible ACM, collection of bulk samples from materials suspected to contain asbestos, determination of types of ACM found and cost estimates for remediation.

Bulk samples analyses for asbestos were performed using the standard Polarized Light Microscopy (PLM) in accordance with Environmental Protection Agency (EPA) standard. Bulk samples were collected by a Massachusetts licensed asbestos inspector Mr. Leonard Busa (AI-030673) and analyzed by a Massachusetts licensed laboratory Asbestos Identification Laboratory, Woburn, MA.

Samples results are attached.

2.0 FINDINGS:

The regulations for asbestos inspection are based on representative sampling. It would be impractical and costly to sample all materials in all areas. Therefore, representative samples of each homogenous area were collected and analyzed or assumed. All suspect materials were grouped into homogenous areas. By definition a homogenous area is one in which the materials are evenly mixed and similar in appearance and texture throughout. A homogeneous area shall be determined to contain asbestos based on findings that the results of at least one sample collected from that area shows that asbestos is present in an amount greater than 1 percent. No additional accessible ACM was found during this survey. However, hidden ACM may be found during any renovation or demolition activities.

Number of Samples Collected

Seventy one (71) bulk samples were collected from the following materials suspected of containing asbestos:

Sample Number, Type and Location of Material

1. Black paper under hardwood floor
2. Black paper under hardwood floor
3. Black paper under hardwood floor
4. Black paper under hardwood floor
5. Black paper under hardwood floor
6. Black paper under hardwood floor
7. Black paper under hardwood floor

8. Black paper under hardwood floor
9. Joint compound at gymnasium storage
10. Joint compound at gymnasium storage
11. Glazing caulking for window in wood door at cafeteria
12. Glazing caulking for window in wood door at gymnasium
13. Interior window glazing caulking over door at classroom 2
14. Interior window glazing caulking over door at classroom 10
15. Glazing caulking for ceiling window at hallway by classroom 10
16. Glazing caulking for ceiling window at hallway by classroom 2
17. Glazing caulking for viewing window at tunnel humidifier system
18. Glazing caulking for viewing window at tunnel humidifier system
19. Brown 12” x 12” vinyl floor tile at gymnasium
20. Mastic for brown 12” x 12” vinyl floor tile at gymnasium
21. Brown 12” x 12” vinyl floor tile at gymnasium
22. Mastic for brown 12” x 12” vinyl floor tile at gymnasium
23. 12” x 12” Vinyl floor tile at classroom 9
24. Mastic for 12” x 12” vinyl floor tile at classroom 9
25. 12” x 12” Vinyl floor tile at classroom 9
26. Mastic for 12” x 12” vinyl floor tile at classroom 9
27. 12” x 12” Vinyl floor tile under carpet at classroom 6
28. Mastic for 12” x 12” vinyl floor tile under carpet at classroom 6
29. 12” x 12” Vinyl floor tile under carpet at classroom 6
30. Mastic for 12” x 12” vinyl floor tile under carpet at classroom 6
31. Cement floor at boy’s room by classroom 3
32. Cement floor at girl’s room by classroom 3
33. Cement floor at staff bathroom by library
34. Ceiling plaster at hallway by classroom 11
35. Ceiling plaster at classroom 1
36. Ceiling plaster at classroom 10
37. Ceiling plaster at hallway by nurse
38. Ceiling plaster at nurse
39. Ceiling plaster at exist hallway by classroom 4
40. Wall plaster at gymnasium
41. Wall plaster at classroom 3
42. Wall plaster at classroom 9
43. Wall plaster at hallway by classroom 1
44. Wall plaster at classroom 6
45. Duct insulation at tunnel humidifier system
46. Duct insulation at tunnel humidifier system
47. Duct insulation at tunnel humidifier system
48. Ceiling plaster type II at tunnel electrical room
49. Ceiling plaster type II at tunnel electrical room
50. Ceiling plaster type II at tunnel electrical room
51. Ceiling plaster type III at tunnel electrical room
52. Ceiling plaster type III at tunnel electrical room
53. Ceiling plaster type III at tunnel electrical room
54. Ceiling plaster type III at tunnel electrical room
55. Ceiling plaster type III at tunnel electrical room
56. Pipe insulation at tunnel system outside electrical room

57. Debris in soil at tunnel system under classroom
58. Blue wall paint at girl's room by classroom 10
59. Blue wall paint at girl's room by classroom 10
60. Exterior new window framing caulking by main entrance
61. Exterior new window framing caulking at courtyard
62. Exterior new window framing caulking at courtyard
63. Exterior soft black glazing caulking for new window at courtyard
64. Exterior soft black glazing caulking for new window at courtyard
65. Exterior soft black glazing caulking for new window at courtyard
66. Exterior new door framing caulking
67. Exterior new door framing caulking
68. Exterior old door framing caulking
69. Exterior old door framing caulking
70. Exterior glazing caulking for old window over new door
71. Exterior glazing caulking for old window over new door

Sample Results

Sample Number, Type and Location of Material	Sample Result
1. Black paper under hardwood floor	No Asbestos Detected
2. Black paper under hardwood floor	No Asbestos Detected
3. Black paper under hardwood floor	No Asbestos Detected
4. Black paper under hardwood floor	No Asbestos Detected
5. Black paper under hardwood floor	No Asbestos Detected
6. Black paper under hardwood floor	No Asbestos Detected
7. Black paper under hardwood floor	No Asbestos Detected
8. Black paper under hardwood floor	No Asbestos Detected
9. Joint compound at gymnasium storage	3% Asbestos
10. Joint compound at gymnasium storage	2% Asbestos
11. Glazing caulking for window in wood door at cafeteria	No Asbestos Detected
12. Glazing caulking for window in wood door at gymnasium	No Asbestos Detected
13. Interior window glazing caulking over door at classroom 2	No Asbestos Detected
14. Interior window glazing caulking over door at classroom 10	No Asbestos Detected
15. Glazing caulking for ceiling window at hallway by classroom 10	No Asbestos Detected
16. Glazing caulking for ceiling window at hallway by classroom 2	No Asbestos Detected
17. Glazing caulking for viewing window at tunnel humidifier system	No Asbestos Detected
18. Glazing caulking for viewing window at tunnel humidifier system	No Asbestos Detected
19. Brown 12" x 12" vinyl floor tile at gymnasium	No Asbestos Detected
20. Mastic for brown 12" x 12" vinyl floor tile at gymnasium	5% Asbestos
21. Brown 12" x 12" vinyl floor tile at gymnasium	No Asbestos Detected
22. Mastic for brown 12" x 12" vinyl floor tile at gymnasium	2% Asbestos
23. 12" x 12" Vinyl floor tile at classroom 9	No Asbestos Detected
24. Mastic for 12" x 12" vinyl floor tile at classroom 9	No Asbestos Detected
25. 12" x 12" Vinyl floor tile at classroom 9	No Asbestos Detected
26. Mastic for 12" x 12" vinyl floor tile at classroom 9	No Asbestos Detected
27. 12" x 12" Vinyl floor tile under carpet at classroom 6	No Asbestos Detected
28. Mastic for 12" x 12" vinyl floor tile under carpet at classroom 6	No Asbestos Detected
29. 12" x 12" Vinyl floor tile under carpet at classroom 6	No Asbestos Detected

30. Mastic for 12” x 12” vinyl floor tile under carpet at classroom 6 — No Asbestos Detected
31. Cement floor at boy’s room by classroom 3 — 2% Asbestos
32. Cement floor at girl’s room by classroom 3 — 3% Asbestos
33. Cement floor at staff bathroom by library — 2% Asbestos
34. Ceiling plaster at hallway by classroom 11 — No Asbestos Detected
35. Ceiling plaster at classroom 1 — No Asbestos Detected
36. Ceiling plaster at classroom 10 — No Asbestos Detected
37. Ceiling plaster at hallway by nurse — No Asbestos Detected
38. Ceiling plaster at nurse — No Asbestos Detected
39. Ceiling plaster at exist hallway by classroom 4 — No Asbestos Detected
40. Wall plaster at gymnasium — No Asbestos Detected
41. Wall plaster at classroom 3 — No Asbestos Detected
42. Wall plaster at classroom 9 — No Asbestos Detected
43. Wall plaster at hallway by classroom 1 — No Asbestos Detected
44. Wall plaster at classroom 6 — No Asbestos Detected
45. Duct insulation at tunnel humidifier system — No Asbestos Detected
46. Duct insulation at tunnel humidifier system — No Asbestos Detected
47. Duct insulation at tunnel humidifier system — No Asbestos Detected
48. Ceiling plaster type II at tunnel electrical room — No Asbestos Detected
49. Ceiling plaster type II at tunnel electrical room — No Asbestos Detected
50. Ceiling plaster type II at tunnel electrical room — No Asbestos Detected
51. Ceiling plaster type III at tunnel electrical room — No Asbestos Detected
52. Ceiling plaster type III at tunnel electrical room — No Asbestos Detected
53. Ceiling plaster type III at tunnel electrical room — No Asbestos Detected
54. Ceiling plaster type III at tunnel electrical room — No Asbestos Detected
55. Ceiling plaster type III at tunnel electrical room — No Asbestos Detected
56. Pipe insulation at tunnel system outside electrical room — 40% Asbestos
57. Debris in soil at tunnel system under classroom — 35% Asbestos
58. Blue wall paint at girl’s room by classroom 10 — No Asbestos Detected
59. Blue wall paint at girl’s room by classroom 10 — No Asbestos Detected
60. Exterior new window framing caulking by main entrance — No Asbestos Detected
61. Exterior new window framing caulking at courtyard — No Asbestos Detected
62. Exterior new window framing caulking at courtyard — No Asbestos Detected
63. Exterior soft black glazing caulking for new window at courtyard — No Asbestos Detected
64. Exterior soft black glazing caulking for new window at courtyard — No Asbestos Detected
65. Exterior soft black glazing caulking for new window at courtyard — No Asbestos Detected
66. Exterior new door framing caulking — No Asbestos Detected
67. Exterior new door framing caulking — No Asbestos Detected
68. Exterior old door framing caulking — No Asbestos Detected
69. Exterior old door framing caulking — No Asbestos Detected
70. Exterior glazing caulking for old window over new door — No Asbestos Detected
71. Exterior glazing caulking for old window over new door — 2% Asbestos

Observations and Conclusions:

All ACM must be removed by a Massachusetts licensed asbestos abatement contractor prior to any renovation or demolition activities that might disturb the ACM under the supervision of a Massachusetts licensed project monitor. A project design by a Massachusetts licensed designer should also be performed that will outline a detailed scope of work.

1. Joint compound was found to contain asbestos. The ACM was found at storage room.

2. Mastic for brown 12" x 12" vinyl floor tile was found to contain asbestos. The ACM was found at the gymnasium.
3. Cement floor was found to contain asbestos. The ACM was found at various bathrooms.
4. Pipe insulation and debris were found to contain asbestos. The ACM was found at various locations including tunnels and crawl space system. The ACM was also found buried in the soil.
5. Exterior glazing caulking for old window over new door was found to contain asbestos.
6. Glue holding blackboard was assumed to contain asbestos.
7. It appears that all windows are new. However, old windows were assumed to exist (boarded-up) and assumed to contain asbestos.
8. All remaining suspect materials were found not to contain asbestos. Hidden ACM may be found during renovation and demolition activities.
9. Roofing material was assumed to contain asbestos. Roofing material does not have to be removed by a licensed asbestos contractor. However, the General Contractor must comply with OSHA regulation during demolition and with state regulations for proper disposal.
10. Underground sewer pipe was assumed to contain asbestos.
11. Damproofing and flashing on exterior and foundation walls was assumed to contain asbestos. The demolition contractor will have to segregate the ACM from non-ACM building surfaces for proper disposal in an EPA approved landfill that does not recycle.

Lead Based Paint (LBP):

Observations and Conclusions:

Painted surfaces were assumed to be LBP. A school is not considered a regulated facility therefore the Massachusetts Lead Law does not apply. All LBP activities performed, including waste disposal, should be in accordance with applicable Federal, State, or local laws, ordinances, codes or regulations governing evaluation and hazard reduction. In the event of discrepancies, the most protective requirements prevail. These requirements can be found in OSHA 29 CFR 1926-Construction Industry Standards, 29 CFR 1926.62-Construction Industry Lead Standards, 29 CFR 1910.1200-Hazards Communication, 40 CFR 261-EPA Regulations. According to OSHA, any amount of LBP triggers compliance.

PCB's- Electrical Equipment and Light Fixtures:

Observations and Conclusion:

Visual inspection of various equipments such as light fixtures, thermostats, exit signs and switches was performed for the presence of PCB's and mercury. Ballasts in light fixtures were assumed not to contain PCB's since there were labels indicating that "No PCB's" was found. Tubes in light fixtures, thermostats, switches and exist signs were assumed to contain mercury.

It would be very costly to test those equipments and dismantling would be required to access. Therefore, the above mentioned equipments should be disposed in an EPA approved landfill as part of the demolition project.

PCB's in Caulking:

Observations and Conclusions:

Caulking and building materials were assumed to contain PCB's. PCB's are manmade chemicals that were widely produced and distributed across the country from the 1950s to 1977 until the production of PCB's was banned by the EPA law which became effective in 1978. PCB's are a class of chemicals made up of more than 200 different compounds. PCB's are non-flammable, stable, and good insulators so they were widely used in a variety of products including: electrical transformers and capacitors, cable and wire coverings, sealants and caulking, and household products such as television sets and fluorescent light fixtures. Because of their chemical properties, PCB's are not very soluble in water and they do not break down easily in the environment. PCB's also do not readily evaporate into air but tend to remain as solids or thick liquids. Even though PCB's have not been produced or used in the country for more than 30 years, they are still present in the environment in the air, soil, and water and in our food. EPA requires that all construction waste including caulking be disposed as PCB's if PCB's level exceed 50 mg/kg (ppm). Should PCB's was found then EPA regulations must be implemented immediately. Therefore, no testing was performed during this survey, but might be performed prior to design development.

3.0 COST ESTIMATES:

The cost includes removal and disposal of all accessible ACM, other hazardous material and an allowance for removal of inaccessible or hidden ACM that may be found during the demolition project.

Location	Material	Approximate Quantity	Cost Estimate ($)
Storage Room	Joint Compound	250 SF	1,000.00
Gymnasium	Vinyl Floor Tiles and Mastic	2,500 SF	10,000.00
Bathrooms	Cement Floor	1,500 SF	15,000.00
Electrical Room	Pipe and Hard Joint Insulation	120 LF	1,200.00
Various Locations	Blackboards	Unknown	15,000.00
	Hidden and Miscellaneous HM	Unknown	35,000.00
Tunnels/Crawl Space	Pipe and Hard Joint Insulation	3,500 LF	70,000.00
	Soil	20,000 SF	40,000.00
Exterior	Old Windows	Unknown	10,000.00
	Old Doors	2 Total	200.00
	Roofing Demolition	Unknown	25,000.00
	Transite Sewer Pipes	Unknown [1]	25,000.00
	Thru-Wall Flashing	Unknown [1]	25,000.00
	Dampproofing on Exterior/Foundation Walls	Unknown [1]	175,000.00
PCB's Remediation[2]			30,000.00
Estimated costs for PCB's Testing and Abatement Plans Services[2]			8,000.00
Estimated costs for Design, Construction Monitoring and Air Sampling Services			44,200.00
		TOTAL:	***520,000.00***

[1]: Part of total demolition.
[2]: Should results exceed EPA limit.

4.0 DESCRIPTION OF SURVEY METHODS AND LABORATORY ANALYSES:

Asbestos samples were collected using a method that prevents fiber release. Homogeneous sample areas were determined by criteria outlined in EPA document 560/5-85-030a. Bulk material samples were analyzed using PLM and dispersion staining techniques in accordance with EPA method 600/M4-82-020.

5.0 LIMITATIONS AND CONDITIONS:

This report has been completed based on visual and physical observations made and information available at the time of the site visits, as well as an interview with the Owner's representatives. This report is intended to be used as a summary of available information on existing conditions with conclusions based on a reasonable and knowledgeable review of evidence found in accordance with normally accepted industry standards, state and federal protocols, and within the scope and budget established by the client. Any additional data obtained by further review must be reviewed by UEC and the conclusions presented herein may be modified accordingly.

This report and attachments, prepared for the exclusive use of Owner for use in an environmental evaluation of the subject site, are an integral part of the inspections and opinions should not be formulated without reading the report in its entirety. No part of this report may be altered, used, copied or relied upon without prior written permission from UEC, except that this report may be conveyed in its entirety to parties associated with Owner for this subject study.

Inspected By:

Leonard Busa
Asbestos Inspector (AI-030673)

Asbestos Identification Laboratory

165 New Boston St., Ste 271
Woburn, MA 01801
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Batch: 3311

Lab Code: 200919-0

December 18, 2014

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:
Project Name: Alma Del Mar Charter School, New Bedford, MA
Date Sampled: 2014-12-16
Work Received: 2014-12-17

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

Dear Ammar Dieb,

Asbestos Identification Laboratory has completed the analysys 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. 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

Thank you Ammar Dieb for your business.

Michael Manning
Owner/Director

Ammar Dieb
Universal Environmental Consultants
12 Brewster Road
Framingham, MA 01702

Project Number:
Project Name: Alma Del Mar Charter School, New Bedford, MA
Date Sampled: 2014-12-16
Work Received: 2014-12-17

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

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
1 / 35229	Black Paper Under Hdwd FL	C'rm 11- Coat Rack	black	Cellulose 55 Synthetic 5 Non-Fibrous 40	None Detected
2 / 35230	BL Paper Under Hdwd	Exit Hall by C'rm 4	black	Cellulose 50 Synthetic 5 Non-Fibrous 45	None Detected
3 / 35231	BL Paper Under Hdwd	C'rm 11	black	Cellulose 60 Synthetic 5 Non-Fibrous 35	None Detected
4 / 35232	BL Paper Under Hdwd	C'rm 7	black	Cellulose 60 Synthetic 5 Non-Fibrous 35	None Detected
5 / 35233	BL Paper Under Hdwd	Exit Hall by C'rm 10	black	Cellulose 60 Non-Fibrous 40	None Detected
6 / 35234	BL Paper Under Hdwd	Gym	black	Cellulose 50 Synthetic 5 Non-Fibrous 45	None Detected
7 / 35235	BL Paper Under Hdwd	Stage	black	Cellulose 65 Synthetic 5 Non-Fibrous 30	None Detected
8 / 35236	BL Paper Under Hdwd	C'rm 1	black	Cellulose 60 Non-Fibrous 40	None Detected
9 / 35237	Joint Compound (JC)	Gym Storage	white	Non-Fibrous 97	Detected Chrysotile 3
10 / 35238	JC	Gym Storage	white	Non-Fibrous 98	Detected Chrysotile 2
11 / 35239	GL for Win in Wood Door	Cafe	multi	Non-Fibrous 100	None Detected
12 / 35240	GL for Win in Wood Door	Gym	multi	Non-Fibrous 100	None Detected
13 / 35241	Interior Win GL	Over Door, C'rm-2	multi	Non-Fibrous 100	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %		Asbestos %	
14 / 35242	Interior Win GL	Over Door, C'rm-10	multi	Non-Fibrous	100	None Detected	
15 / 35243	GL for Clg Window	Hall by C'rm-2	multi	Non-Fibrous	100	None Detected	
16 / 35244	GL for Clg Window		multi	Non-Fibrous	100	None Detected	
17 / 35245	GL for Viewing Window	Tunnel Humidifier System	multi	Non-Fibrous	100	None Detected	
18 / 35246	GL for Viewing Window	Tunnel Humidifier System	multi	Non-Fibrous	100	None Detected	
19 / 35247	12" VT-I (Brown)	Gym	brown	Non-Fibrous	100	None Detected	
20 / 35248	Mastic #19	Gym	black	Non-Fibrous	95	**Detected** **Chrysotile**	**5**
21 / 35249	VT-I	Gym	gray	Non-Fibrous	100	None Detected	
22 / 35250	Mastic #21	Gym	black	Non-Fibrous	98	**Detected** **Chrysotile**	**2**
23 / 35251	12" VT-II	C'rm 9	gray	Non-Fibrous	100	None Detected	
24 / 35252	Mastic #23	C'rm 9	yellow	Cellulose Non-Fibrous	10 90	None Detected	
25 / 35253	VT-II	C'rm 9	gray	Non-Fibrous	100	None Detected	
26 / 35254	Mastic #25	C'rm 9	yellow	Cellulose Non-Fibrous	5 95	None Detected	
27 / 35255	VT-III (Under Carpet)	C'rm 6	gray	Non-Fibrous	100	None Detected	
28 / 35256	BL Mastic #27	C'rm 6	black	Cellulose Non-Fibrous	10 90	None Detected	
29 / 35257	VT-III (Under Carpet)	C'rm 6	gray	Non-Fibrous	100	None Detected	
30 / 35258	BL Mastic #29	C'rm 6	black	Cellulose Non-Fibrous	5 95	None Detected	
31 / 35259	Cement Floor	Boy's Rm by C'rm 3	red	Non-Fibrous	98	**Detected** **Chrysotile**	**2**

FieldID / LabID	Material	Location	Color	Non-Asbestos %		Asbestos %	
32 / 35260	Cement Floor	Girl's Rm by C'rm 10	red	Non-Fibrous	97	Detected Chrysotile	3
33 / 35261	Cement Floor	Staff Bathrm- Library	red	Non-Fibrous	98	Detected Chrysotile	2
34 / 35262	Ceiling Plaster (CP)	Hall by C'rm 11	gray	Non-Fibrous	100	None Detected	
35 / 35263	CP	C'rm 1	gray	Non-Fibrous	100	None Detected	
36 / 35264	CP	C'rm 10	gray	Non-Fibrous	100	None Detected	
37 / 35265	CP	Hall by Nurse	gray	Non-Fibrous	100	None Detected	
38 / 35266	CP	Nurse	gray	Non-Fibrous	100	None Detected	
39 / 35267	CP	Exit Hall by C'rm 4	gray	Non-Fibrous	100	None Detected	
40 / 35268	Wall Plaster (WP)	Gym	gray	Non-Fibrous	100	None Detected	
41 / 35269	WP	C'rm 3	gray	Non-Fibrous	100	None Detected	
42 / 35270	WP	C'rm 9	gray	Non-Fibrous	100	None Detected	
43 / 35271	WP	Hall Along C'rm-1	gray	Non-Fibrous	100	None Detected	
44 / 35272	WP	Cr'm 6	gray	Non-Fibrous	100	None Detected	
45 / 35273	(Non-Susp) DI	Tunnel- Humidifier Side	brown	Cellulose Non-Fibrous	95 5	None Detected	
46 / 35274	(Non-Susp) DI	Tunnel- Humidifier Side	brown	Cellulose Non-Fibrous	95 5	None Detected	
47 / 35275	(Non-Susp) DI	Tunnel- Humidifier Side	brown	Cellulose Non-Fibrous	95 5	None Detected	
48 / 35276	CP-II	Tunnel Elect. Rm	white	Hair Non-Fibrous	< 1 100	None Detected	
49 / 35277	CP-II	Tunnel Elect Rm	white	Hair Non-Fibrous	2 98	None Detected	

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
50 / 35278	CP-II	Tunnel Elect Rm	white	Hair < 1 Non-Fibrous 100	None Detected
51 / 35279	CP-III (HH?)	Tunnel (Elect Rm Side)	white	Hair 2 Non-Fibrous 98	None Detected
52 / 35280	CP-III	Tunnel (Elect Rm Side)	white	Hair < 1 Non-Fibrous 100	None Detected
53 / 35281	CP-III	Tunnel (Humidifier Side)	white	Hair < 1 Non-Fibrous 100	None Detected
54 / 35282	CP-III	Tunnel (Main Office End)	white	Hair 2 Non-Fibrous 98	None Detected
55 / 35283	CP-III	Tunnel (Along Courtyard)	white	Hair < 1 Non-Fibrous 100	None Detected
56 / 35284	Pipe Insulation PI	Tunnel System Outside Elect Rm	multi	Non-Fibrous 60	Detected Chrysotile 40
57 / 35285	PI Debris in Soil	Under C'rm @ Tunnel System	white	Mineral Wool 30 Non-Fibrous 35	Detected Chrysotile 35
58 / 35286	Blue Wall Paint & ?	Girl's Rm by C'rm 10	blue	Non-Fibrous 100	None Detected
59 / 35287	Blue Wall Paint & ?	Girl's Rm by C'rm 10	blue	Non-Fibrous 100	None Detected
60 / 35288	(New) Win Fr	By Main Entrance, Exterior	brown	Non-Fibrous 100	None Detected
61 / 35289	(New) Win Fr	Courtyard, Exterior	brown	Non-Fibrous 100	None Detected
62 / 35290	(New) Win Fr	Courtyard- Girl's Rm, Exterior	brown	Non-Fibrous 100	None Detected
63 / 35291	Soft Black GL for New Win	Courtyard- Girl's Rm, Exterior	black	Non-Fibrous 100	None Detected
64 / 35292	Soft Black GL for New Win	Courtyard- Random, Exterior	black	Non-Fibrous 100	None Detected
65 / 35293	Soft Black GL for New Win	Courtyard- Random, Exterior	black	Non-Fibrous 100	None Detected
66 / 35294	(New) Door Fr	Random, Exterior	brown	Non-Fibrous 100	None Detected
67 / 35295	(New) Door Fr	Courtyard- Random, Exterior	brown	Non-Fibrous 100	None Detected

FieldID / LabID	Material	Location	Color	Non-Asbestos %		Asbestos %	
68 / 35296	Old Door Fr	Boiler Rm Entrance, Exterior	tan	Non-Fibrous	100	None Detected	
69 / 35297	Old Door Fr	Boiler Rm Entrance, Exterior	tan	Non-Fibrous	100	None Detected	
70 / 35298	Win GL for Old Win Over New Door	Street Side Entrance-II, Exterior	multi	Non-Fibrous	100	None Detected	
71 / 35299	Win GL for Old Win Over New Door	Main Entrance, Exterior	multi	Non-Fibrous	98	Detected Chrysotile	2

CHAIN OF CUSTODY

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Town/City: New Bedford, MA Building Name Alma del Mar Charter School

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Sample	Result	Description of Material	Sample Location
1		black paper under hdwd fl	c/rm 11 - coatrack
2		bl paper under hdwd	exit hall by c/rm 4
3		bl paper under hdwd	c/rm 11
4		bl paper under hdwd	c/rm 7
5		bl paper under hdwd	exit hall by c/rm 10
6		bl paper under hdwd	Gym
7		bl paper under hdwd	STAGE
8		bl paper under hdwd	c/rm 1
9		Joint Compound (JC)	Gym storage
10		JC	" "
11		gl for win in wood door	CAFE
12		gl for win in wood door	Gym
13		interior win gl	over door, c/rm-2
14		interior win gl	over door, c/rm-10
15		gl for clg window	hall by c/rm-10
16		gl for clg window	hall by c/rm-2
17		gl for viewing window	Tunnel Humidifier System
18		gl for viewing window	" " " "
19		12" VT-I (Brown)	Gym
20		mastic #19	Gym

Reported By: [signature] Date: 12-16-14 Due Date: 24-hr

Received By: [signature] Date: 12/17/14

4

CHAIN OF CUSTODY

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adieb@uec-env.com

Town/City: New Bedford, MA Building Name Alma del Mar Charter School

Sample	Result	Description of Material	Sample Location
21		VT-I	Gym
22		mastic #21	"
23		12" VT-II	c/rm 9
24		mastic #23	" "
25		VT-II	c/rm 9
26		mastic #25	" "
27		VT-III (under carpet)	c/rm 6
28		Bl mastic #27	//
29		VT-III (under carpet)	//
30		Bl mastic #29	//
31		cement floor	Boys rm by c/rm 3
32		cement floor	Girls rm by c/rm 10
33		cement floor	STAFF BATHRM ~ Library
34		CEILING PLASTER (CP)	hall by c/rm 11
35		CP	c/rm 1
36		CP	c/rm 10
37		CP	hall by Nurse
38		CP	Nurse
39		CP	exit hall by c/rm 4
40		wall plaster (WP)	Gym

Reported By: [signature] Date: 12-16-14 Due Date: 24-hr

Received By: Date:

CHAIN OF CUSTODY

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Town/City: New Bedford MA Building Name ALMA del Mar Charter School

Sample	Result	Description of Material	Sample Location
41		WP	c/rm 3
42		WP	c/rm 9
43		WP	hall along c/rm-1
44		WP	c/rm 6
45		(NON-SUSP) (D1)	Tunnel - Humidifier side
46		(NON-SUSP) (D1)	Tunnel / /
47		(NON-SUSP) (D1)	Tunnel /
48		CP-II	Tunnel ELECT. rm
49		CP-II	Tunnel ELECT rm
50		CP-II	Tunnel ELECT rm
51		CP-III (bh?)	Tunnel (elect rm side)
52		CP-III	Tunnel (elect rm side)
53		CP-III	Tunnel (humidifier side)
54		CP-III	Tunnel (main office End)
55		CP-III	Tunnel (along courtyard)
56		Pipe insulation (P1)	Tunnel system outside ELECT rm
57		(P1) debris in soil	under c/rm c. Tunnel system
58		Blue wall paint ?	Girl's rm by c/rm 10
59		Blue wall paint ?	Girl's rm by c/rm 10
60		(new) win fr	by MAIN ENTRANCE EXTERIOR

Reported By: [signature] Date: 12-16-14 Due Date: 24-hr

Received By: Date:

CHAIN OF CUSTODY

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Town/City: New Bedford, MA Building Name Alma del Mar Charter School

Sample	Result	Description of Material	Sample Location
61		(new) win fr	courtyard EXTERIOR
62		(new) win fr	courtyard - Girl's rm
63		soft black gl for new win	" " " "
64		soft black gl for new win	courtyard - random
65		soft black gl for new win	courtyard - random
66		(new) door fr	random
67		(new) door fr	courtyard - random
68		old door fr	boiler rm entrance
69		old door fr	" " "
70		~~old~~ win gl for old win over new door	street side entrance - II
71		win gl for old win over new door	main entrance

Reported By: [signature] Date: 12-16-14 Due Date:

Received By: Date:

HVAC ASSESSMENT

Heating System:

The building is primarily heated by a two gas-fired low pressure steam cast iron sectional boilers. The boilers were manufactured by Weil McLain (Model 1188), and were installed in the mid 1980's according to discussions with facility staff. In the late 1980s/early 1990's, the boiler burners, manufactured by PowerFame (Model WCR-3-GO-20), were converted to operate on natural gas only from dual fuel oil and natural gas. During this time the old fuel oil tanks, which were located above grade at the exterior of the building, were removed. The boilers appear to be in fair physical condition, and have received proper maintenance throughout the years. Boiler No. 1 has had some internal leaks which have been recently repaired. The boilers each have a capacity of 2115 MBH, 15 psi Steam output and IBR input of 3392 MBH natural gas.

Steam Boilers, Boiler #1 (right), Boiler#2 (left)

Boiler Feedwater Unit

Boiler Control Panel

Boiler Feedwater Tank with Repaired Leak

The boiler plant appears to have all code required gas shut-off, heat detector, and low water cutoff safety controls installed.

The boilers are vented through a masonry chimney via a common insulated steel breeching system. The condition or presence of a chimney liner could not be confirmed during the site visit.

Combustion air is provided to the boiler primarily from a wall-mounted combustion air louver and duct equipped with automatic control damper. The combustion air ductwork terminates approximately 12" above the floor of the mechanical room. The size of the louver and combustion air ductwork openings do not appear to be large enough to meet current code requirements for combustion air openings from the outdoors. There is a potential that combustion air is also provided from adjacent rooms. It is our understanding from discussions with the facility staff that the boilers run properly and do not show signs of improper operation due to inadequate combustion air.

Boiler Combustion Air Ductwork

There is a boiler feed water condensate receiver and feed water tank located in the corner of the Boiler Room adjacent to the boilers. The feed water tank was installed circa the mid 1980's and was manufactured by Dunham Bush. The feed water unit has two (2) 0.5 hp pumps. It is our understanding that the feed water tank has recently been serviced to repair an internal leak and has been patched at one end. One of the feed water pumps was also rebuilt in 2011.

There is a floor-mounted boiler blow down receiver and vent tank located in the corner of the boiler room opposite the boiler feed water unit. The receiver unit appears to have been installed around the time the building was originally constructed. The tank was manufactured by Elkhardt Iron Works.

The majority of the steam and condensate piping distribution system appears to be in fair to poor condition with signs of visible corrosion and missing insulation in sections of the piping. Some of the piping insulation is believed to contain asbestos material. It is our understanding that the system's steam condensate traps are properly maintained on an annual basis.

Boiler Blow Down Receiver and Vent Tank

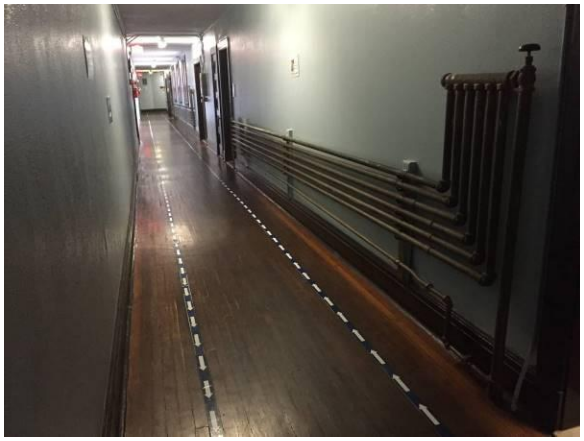
Condensate Piping which may contain Asbestos insulation material

The steam boiler heating system is controlled by a Weil McLain boiler heating controller and a pneumatic control system. Space heating radiators are typically controlled by pneumatic type thermostats.

Pneumatic ATC Compressor

Pneumatic Heating Thermostat

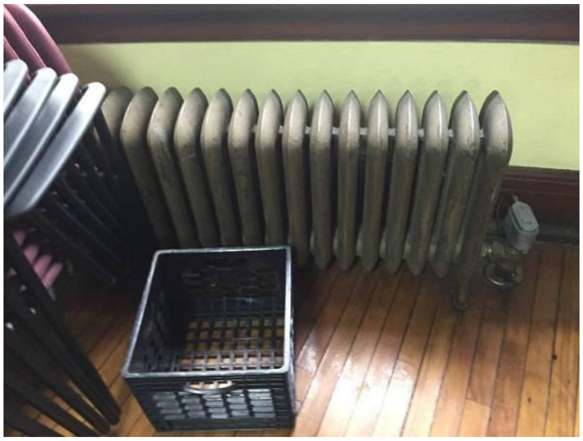
Steam is distributed from the boilers to building steam heating equipment, which consists largely of steam cast iron radiators and steam piping radiators, via a 2-pipe steel low pressure steam and condensate return piping distribution system. The majority of steam radiators appear to be originally installed equipment, and therefore have exceeded their expected useful service life. Steam control valves have been replaced on an as-needed basis throughout the years.



Steam Piping Radiator in Corridor

Gymnasium Steam Radiators

Typical Classroom Steam Radiator



Library Steam Radiator

Ventilation and Air Conditioning Systems:

The majority of the building is not currently mechanically ventilated or air conditioned.

There is an abandoned-in-place air handling system that previously provided tempered ventilation air to the building. The air handling unit is located in a mechanical room adjacent to the boiler room. The air handling unit fan was manufactured by Sirocco American Blower Co. and operates on 550V electrical service. The fan is believed to be inoperable. The unit is believed to be originally installed equipment from when the building was originally constructed. The unit currently has steam heating coils and piping connected to the unit. Facility staff also indicated that it is believed that the unit previously had an evaporative cooling system connected. Ventilation ductwork is routed from the unit to floor and sidewall grilles located throughout the building.

Air Handing Unit Fan

Abandoned Ventilation Floor Grilles

There is an inoperable exhaust air fan that is located in one of the tunnels located below the building. It is our undertsanding that the fan has not been used for several years. The associated exhaust air ductwork appears to be in fair condition.

Exhaust Fan in Tunnel (Abandoned)

Boy's Restroom Exhaust Ductwork and Grilles

Gymnsium Roof Fan Opening

Typical Classroom Sidewall Ventilation Grille

The boy's and girl's restrooms have exhaust air ductwork and grilles installed which appear to be in fair condition; however, it is our understanding that the connected exhaust air fan(s) are not operable.

The gymnasium appears to have been served by two roof-mounted exhaust fans at one point in time; however, those roof fan openings are currently boarded up.

Natural Gas Service:

The building has a 3" natural gas service which currently provides natural gas for the heating boilers and domestic hot water heater. The gas meter is an aluminum case type meter (Model No. 67s5343878) with 5000 CF capacity at ½" differential and 11,000 CF capacity at 2" differential. Gas service is provided by NStar.

Main Gas Line (in Basement "Electrical Room")

Gas Meter

Electrical Service:

Electric Transformer

Electrical Meter

Electrical service is provided to the building via a pad-mounted transformer located at the exterior of the building on the Earle Street side of the building. Electrical service is provided by NStar. The electrical service is an 800 Amp, 208/120 V/3 Phase 4 wire distribution system. The electrical main distribution switchgear and panelboard were manufactured by Siemens (MDP Catalog #S5C60M6800DB – Type S5) and were installed in 1994. Both appear to be in good condition. There is a 550 volt step up transformer located adjacent to the electrical panelboard. The transformer was manufactured by GE (Catalog# 9T23Q1266). The transformer serves the abandoned-in-place central ventilation air handling unit system located in the mechanical room adjacent to the boiler room.

"Electrical Room" – Transformer and Panel board (left) & Main Service Distribution Panel (right)

Electrical Panel Board and Step Up Transformer

Main Electrical Switchgear Distribution Panel

600 Volt Electrical Panel

In the old abandoned-in-place air handling unit room, there is a 600 Volt electrical panelboard and switchgear which previously served the heating and ventilation and evaporative cooling air handling unit. It is our understanding that this 600V electrical distribution system is no longer used.

Recommendations:

In general, we would consider the current existing steam heating system to be minimalistic in design and function. Many of the exterior walls in the building are not insulated and have high levels of infiltration. There are minimal zone heating control zones.

While the steam heating system has been maintained throughout the years, the steam boilers and accessories, majority of the terminal steam heating radiators and associated steam and condensate piping are beyond their expected useful service life.

The majority of areas of the building are not provided with mechanical ventilation, and only rooms that are located along exterior walls with windows are ventilated by natural ventilation though the use of operable windows; however, even these rooms likely receive less than ideal ventilation due to the lack of operable exhaust air ventilation fan systems. In addition, neither the gymnasium nor the restrooms in the building have operable exhaust air ventilation systems.

Therefore we recommend the following HVAC system upgrades:

- Heating System: The existing steam heating system overall appears to be in fair condition and could be re-used and should be serviceable for the next 5 years with continued preventative maintenance.
  - If the existing steam boiler heating system is to remain in service, we recommend that the boilers and feed water unit are inspected and serviced annually, all steam condensate traps are properly maintained, and the terminal heating unit controls are tested annually.
  - For improved energy efficiency, thermal comfort control and to address the capital replacement needs of the heating system, we recommend that a new high efficiency gas-fired condensing boiler heating system be installed to replace the existing low pressure steam boiler heating system.
  - Existing steam boilers and accessories and steam and condensate piping should be replaced with new gas-fired hot water boilers, pumps, accessories, and an insulated hot water piping distribution system.
  - New hot water terminal heating equipment, i.e. fin tube radiation heating, unit heaters, etc. should be provided to replace the existing steam radiators.
- Ventilation: New mechanical ventilation systems should be provided to serve the building. For higher energy efficiency, energy recovery ventilation system(s) should be provided to serve the building.
  - At a minimum, new general exhaust air fan systems should be provided to serve the classroom and office areas of the building. In the majority of areas, the existing abandoned exhaust ductwork could potentially be re-used, but should be internally cleaned prior to re-use. New exhaust air fans could work in conjunction with the use of operable windows as a means of provided ventilation air to the majority of areas.
  - New exhaust air fan systems should be installed for the gymnasium, restrooms and custodial closets in the building.
- Air Conditioning: If air conditioning is provided for the building, we would recommend that a high efficiency air conditioning system is installed, and that a life cycle cost analysis be performed to determine the most cost effective system choice. The building electrical service would likely need to be upgraded to handle the increased electrical loads associated with air conditioning.

- Controls: As part of a major HVAC system renovation, we recommend that all new replacement HVAC systems be controlled by a newly installed direct digital control, energy management system for improved thermal comfort control and energy efficient system operation to replace the existing pneumatic control system.

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ALMA del MAR CHARTER SCHOOL
New Bedford, Massachusetts

Existing Conditions/Conceptual Design Structural Report
December 18, 2013

I. Introduction and General Description

Foley Buhl Roberts & Associates, Inc. (FBRA) is collaborating with *HMFH Architects, Inc. (HMFH)* in the review existing conditions and the evaluation of planning options for the Alma del Mar Charter School in Fall River, Massachusetts. The purpose of this report is to identify and describe the structural systems of the various sections of the school and to comment on the structural issues/conditions observed. Comments relating to potential renovations, alterations and additions to the building (governed by the Massachusetts Existing Building Code (MEBC – 8^{th} Edition)) are presented as well.

The Alma del Mar Charter School is located at 26 Madeira Avenue in New Bedford, Massachusetts. The one-story, wood and steel framed, flat roof building was originally constructed as an elementary school in 1908. The facility continued to serve as an elementary school until the City of New Bedford closed it in 2009. There have been no additions to the building and it does not appear that any major renovations or structural alterations have occurred since the original construction. The Alma del Mar Charter School occupied the building in 2011 and is presently considering an expansion of the facility from grades K-4 to grades K-8 (renovation/addition) or, alternately, constructing a new building on a site to be determined.

The building is rectangular in plan, with the long dimension oriented along in the east-west direction. The main entrance is located on the west side of the facility, between two classrooms. Additional classrooms are located along the north and south perimeter walls of the building, flanking Administrative Offices, a central (outdoor) Courtyard, the Library and the Gymnasium, which is located at the eastern end of the building. There are three, equally spaced exits with concrete/stone stairs, located along the north and the south sides of the school (six total). An exterior porch with a colonnade was constructed on the east end of the building. The site generally slopes downwards from west to east, approximately 10 feet. Modular classrooms have been installed on the west side of the original building, between the main entrance and Madeira Avenue.

Foundation walls are cast-in place concrete construction to grade, then clay brick to the First Floor level. The wood and steel framed First Floor of the building is constructed over a crawl space (unventilated; 5+/- feet high); a partial Basement (Boiler Room) is present at the east end of the building, below the Gymnasium (accessed by stair). The wood and steel framed, main roof slopes to internal drains and there are parapets around the entire building perimeter. A wood framed, clay tile clad, sloping "apron" wraps around the building perimeter and the Courtyard, at the parapet level. Original, saw-tooth light monitors on the main roof (over the classrooms) were removed in the past and the roof openings were framed over. The (flat) Gymnasium roof projects approximately 10 feet above the main roof level. Exterior walls are (unreinforced) terra cotta masonry construction, with a stucco finish.

The total floor area of the building (excluding the Basement and crawl space) is approximately 23,900 square feet.

Existing floor and roof construction is classified as Type VB (Non-Combustible/Combustible, Unprotected); there are no sprinklers in the building.

Structural conditions at the Alma del Mar Charter School were reviewed at the site by Jonathan Buhl and Robert Berard of FBRA on November 13, 2013. Our review of the existing structure was limited, as many areas were obscured by finishes. Structurally related issues/conditions were discussed with Mr. Edward Haddad and Mr. John Veenstra (Plant Manager) during the course of our visit to the facility.

No original construction documents or geotechnical information was available. The following documents were reviewed in the preparation of this *Existing Conditions/Conceptual Design Structural Report:*

- *Alma del Mar Charter School Floor Plan*, Updated September 2013.
- Undated photograph of the original building.
- *Commercial Inspection* report, prepared by Aubin's Building Inspection, New Bedford, MA, dated July 14, 2013.
- Architectural report, prepared by HMFH Architects, Inc., Cambridge, MA, dated December 13, 2013 (Includes conceptual sketches of the Addition/Renovation and New Construction options).

No exploratory demolition or structural materials testing was performed in conjunction with this review. Subsurface soils investigations have not been conducted.

II. Structural Systems Description

Roof Construction: Original roof construction consists of wood (board) sheathing (1" nominal) supported by 2x7 (nominal) wood joists spaced at 18"+/- on centers. Joists are supported terra-cotta masonry bearing walls at the building perimeter and at interior corridors. Centrally located steel beams (20+/- inches deep) clear span each classroom (in the east-west direction, parallel to the corridor) and provide an intermediate support for the joists between the interior and perimeter bearing walls. Steel sub-framing (supporting original laylights at the ceiling level) frame into the central steel beams. Cripple stud walls (photo right) were constructed on top of the steel beams to support the (higher) roof framing. The original saw-tooth light monitors have been removed and the roof openings have been infilled with 2x10 joists and plywood sheathing. Roof framing over the Library is similar.

Roof framing at the Gymnasium consists of a timber deck supported by wood purlins, that span in the east-west direction. Purlins are supported by terra cotta masonry bearing walls at the building perimeter and by interior, clear spanning (north-south direction) steel trusses.

Typical masonry parapets at the roof perimeter are approximately 3 feet high and 14" thick. The roof pitches approximately 22", forming two, east-west interior valleys (with drains) over the corridors below. There are two brick chimneys.

First Floor Construction: Typical First Floor construction over the crawl space consists of 1" nominal, diagonally laid wood sheathing on 2x12 (nominal) wood joists spanning in the east-west direction. Joists are supported by brick masonry foundation walls and by 9" deep steel I-beams (photo right). Steel beams span the depth of the classrooms (north-south direction; two per classroom) and are supported by brick masonry foundation walls at each end and by an intermediate brick pier (12x12 nominal). Floor joists have been dropped in bathroom areas to accommodate mud-set tile flooring.

First Floor construction over the Boiler Room (Gymnasium Floor) consists of a reinforced concrete slab (thickness unknown) spanning to concrete encased steel beams.

Basement and Crawl Space Floor Construction: The floor of the Basement Boiler Room (located approximately 17 feet below the First Floor) appears to be a concrete slab on grade; the thickness of the slab is unknown. Floor construction in the high crawl space below the corridors appears to be similar. The balance of the crawl space (below classrooms) has a dirt floor.

Exterior Wall Construction: Typical exterior walls above the First Floor are hollow terra cotta masonry with an exterior stucco finish. The walls appear to be 8" to 10" thick. As commonly found in buildings constructed during this era, there are no drainage cavities or control joints in the walls. The unreinforced masonry exterior walls (as well as the interior walls) serve as load bearing elements and provide lateral stability for wind and seismic loading.

Foundations: Foundation construction is unknown, but is likely conventional spread footings. The presence of a perimeter drainage system is not known.

Fire Resistance: Wood and steel floor and roof framing is unprotected and has no fire resistance rating. There are no sprinklers in the building.

Lateral Load Resistance: As previously noted, lateral stability for the building is provided by unreinforced, interior and exterior masonry walls. The school was designed and constructed prior to the creation of the Massachusetts State Building Code; accordingly, the building does not meet current wind and seismic requirements.

III. Structural Condition/Comments

Structural Conditions at the Alma del Mar Charter School were reviewed at the site (to the extent possible) on November 13, 2013. Generally speaking, floor and roof construction appears to be in satisfactory condition (where visible); there is no evidence of structural distress that would indicate significantly overstressed, deteriorated or failed structural members.

Building foundations generally appear to be performing adequately. Typically, there are no signs of excessive total or differential settlements.

A number of exterior/envelope deficiencies are noted in the above-referenced *Commercial Inspection* report – please refer to that document for additional information. Structural/structurally related conditions observed during the November 13th FBRA visit to the site include the following:

1. The stucco finish on the exterior masonry walls has cracked and failed in a number of locations throughout the building (photos at right). These conditions do not appear to be related to settlement or building movement; rather they are likely the result of constrained thermal and moisture related movements, water infiltration and age-related deterioration. FBRA recommends that an envelope/façade consultant be retained to investigate the stucco finish and to provide recommendations for the repair/replacement of same. Exterior walls are uninsulated; care must be taken if the walls are to be insulated in the future, as their behavior could be adversely impacted. As water has likely infiltrated behind the stucco, exterior walls should be examined for the presence of mold.

2. The stucco finish at the eastern porch/colonnade has severely deteriorated as well, as shown in the photos below.

3. Concrete entry stair walls and landings along the north and south sides of the building are in poor condition and are in need of repair/replacement (photo right). The damage observed appears to be moisture and age related. These conditions will deteriorate at an increasing rate as moisture continues to infiltrate the construction, and freeze-thaw action occurs.

4. A section of the main roof structure (south of the Gymnasium) failed in the past, due to snow drift loading. This section was re-built and appears to be performing satisfactorily. In conjunction with future renovations to the building, FBRA recommends that a complete evaluation of the roof structure be conducted. Potential snow drift areas on the main roof occur on all sides of the gymnasium and at the parapets. The presence of the parapets and the relatively significant pitch to the drains could result in excessive ponded water on the roof, if the drains become plugged or otherwise inoperable. The drains are presently well maintained; continual maintenance of the roof drains is essential; particularly during the late winter/early spring months. The tar and gravel roof is in poor condition and needs replacement (photo right). Water stains on roof sheathing and joists were observed; reportedly rot has been encountered in the past. A thorough examination of the roof framing is recommended in conjunction with a future roof replacement. Repair/replacement of wood sheathing and reinforcing of individual joists may be necessary. The clay tile roofs of the perimeter "apron" structures should also be examined, to ensure that roof tiles are securely anchored to the supporting framework. FBRA notes that there are missing or damaged tiles in certain locations.

5. The condition of the concrete and brick masonry foundation walls in the Boiler Room and the crawl space appears to be satisfactory; no repairs are necessary.

6. Steel beams supporting First Floor construction exhibit surficial rusting in some locations, particularly on the south side of the building where a drain leader ruptured in the past. Mechanical cleaning of the steel and coating with a zinc rich paint is recommended; however, this is not an urgent matter.

7. The live load capacity of the First Floor framing was not determined (beyond the scope of this report); however, the framing is in satisfactory condition and appears to be supporting classroom and corridor loading adequately. Provided, there is no change in use, this construction should continue to function as originally intended. As the wood framing is directional in nature, care must be taken with high book shelving (e.g. in the Library) that aligns with the span direction of the joists.

8. The dirt floor of the crawl space and the concrete floor in the Boiler Room appear to be relatively dry, except at the location of the aforementioned drain leader rupture. Water stains in the Boiler Room do not appear to be groundwater related.

9. The brick chimneys are in fair condition; repointing is recommended. It appears that the upper sections were recently rebuilt.

IV. Option 1: Renovations and Additions – Anticipated Structural Scope

Comments relating to proposed renovations, alterations and additions to the Alma del Mar Charter School (Option 1) are presented in this section. Renovations, alterations, repairs and additions to existing buildings in Massachusetts are governed by the provisions of the Massachusetts State Building Code (MSBC – 780 CMR 8th Edition) and the Massachusetts Existing Building Code (MEBC). These documents are based on amended versions of the 2009 *International Building Code (IBC)* and the 2009 *International Existing Building Code (IEBC)*, respectively.

The MEBC defines three (3) compliance methods for the repair, alteration, change of occupancy, addition or relocation of an existing building. The method of compliance is chosen by the Design Team (based on the project scope and cost considerations) and cannot be combined with other methods. The *Work Area Compliance Method* (IEBC Chapters 4 through 12) would likely be the most appropriate method of compliance for a renovation to the Alma del Mar Charter School. This method is based on a proportional approach to compliance, where upgrades to an existing building are triggered by the type and extent of work. The Work Area Compliance Method includes requirements for three levels of alterations, in addition to requirements for repairs, changes in occupancy, additions, historic buildings or moved buildings.

Regardless of the compliance method chosen, the MEBC currently requires that buildings with unreinforced masonry walls undergoing a significant renovation to be evaluated with respect to the provisions of Appendix A1 of the IEBC (applicable to this building). An assessment of masonry shear stresses, wall slenderness, parapets, wall anchorage, diaphragm anchorage, etc. is required, and the existing building must be capable of resisting at least 75% of the seismic loading required by the Code for new construction. In addition, Section 101.5.4.0 of the Massachusetts Amendments requires that the existing building be investigated in sufficient detail to ascertain the effects of the proposed work on the work area under consideration and the entire building or structure and its foundation, if impacted by the proposed work. The results of this investigation must be submitted to the Code official in written form.

Note that revisions to the MEBC are currently in progress and may impact the comments and conclusions summarized below. In addition, the MEBC is a highly interpretive document and there is no guarantee that a Structural Engineer who may become involved in a future renovation/addition project at the school will necessary reach the same conclusions.

Phased renovations, alterations and additions proposed under Option 1 would result in a *Level 2 Alteration* classification. In addition to the evaluation and repair work noted in **Section III** above (along with required architectural and MEP/FP work), the following scope of structural work is anticipated:

1. For seismic reasons, the existing floor and roof diaphragms will need to be anchored to the existing masonry walls at the building perimeter (e.g. adhesive anchors at a 4+/- feet o.c. spacing).

2. Existing cantilevered parapets will need to be lowered, removed or braced.

3. Scuppers and/or a secondary/overflow drainage system will likely be required, to minimize the potential depth of ponded water on the roof structure.

4. Reinforcing of the existing roof structure (e.g. sistering existing joists with LVL's) around the higher gymnasium roof and along the parapets on the east and west ends of the building will likely be required.

5. The code analysis conducted by HMFH indicates that the existing building can remain Type VB without constructing a fire wall (between the existing building and the proposed addition), provided the building is fully sprinklered and perimeter fire truck access is maintained.

6. The existing building will need to resist 75% of the seismic loading required by the Code for new construction. A detailed evaluation of the building (including field testing of the masonry) would be required to evaluate the capacity of the existing masonry walls and confirm the available capacity; however, given the extent of the masonry walls it is reasonable to assume that the building could meet this requirement with minimal upgrades, provided the walls are not significantly altered (refer to the discussion regarding the east Gymnasium wall below).

7. Proposed Addition: The proposed, two-story, 17,300 SF addition would be constructed on the east side of the existing building. Classrooms, the Kitchen and the Cafeteria would be located at the Lower Level of the addition (located approximately at existing grade). Additional classrooms and an expanded Gymnasium would be located at the First Floor (matching the existing First Floor elevation). An elevator will be provided.

   The porch/colonnade structure and the east wall of the Gymnasium (along with the foundation wall) will need to be removed to accommodate the combined plan layout. The porch/colonnade structure will need to be demolished prior to the construction of the addition. The new addition will likely be steel framed with a conventional spread footing foundation and concrete slab on grade Lower Level floor. Lateral stability for wind and seismic loads would be achieved by steel bracing or reinforced masonry shear walls in each direction. The addition will be designed in accordance with the code for new construction. Construction will be phased, with the new addition completed and occupied before the demolition of the Gymnasium section of the east exterior wall. The demolition of a section of the east exterior wall and foundation wall presents several challenges with respect to the seismic code requirements for the existing building. Two approaches to the new/existing interface are possible:

   - Structurally *separate* the new addition from the existing building with an expansion/seismic joint (most common approach), and
   - Structurally *attach* the new addition to the existing building.

   The proposed, partial removal of the east exterior wall and foundation wall would impact the north-south lateral load capacity of the existing building, triggering the need for additional seismic upgrades (e.g. new shear walls). This work would be costly and would likely impact the planning/uses of the spaces at the east end of the existing building. If the addition is structurally attached, it may be possible design it in a manner such that the north-south lateral load capacity at the east end of the existing building is restored and that forces to the remaining, existing walls remain unchanged or diminished. Such an approach would satisfy MEBC/IEBC 2009 *Level 2* Alteration seismic provisions (Section 707.5) and MEBC/IEBC 2009 *Addition* seismic provisions (Section 1003.3.2), eliminating or reducing the need for additional seismic upgrades. An extensive evaluation would be necessary to determine the most practical and cost effective approach (beyond the scope of this report).