BUILDING ENVELOPE
BET
TECHNOLOGIES, INC.

October 9, 2025

Town of Hingham, Massachusetts
210 Central Street
Hingham, MA 02043

Attn: Mr. J R Frey, P.E.
Town Engineer

Ms. Donna Thompson
Land Use and Development Coordinator

Email: freyj@hingham-ma.gov
thompsond@hingham-ma.gov

RE: Interior Moisture Investigation – Follow-up review
Lincoln School Apartments
Hingham, Massachusetts
BET No. 25009

Dear Mr. Frey and Ms. Thompson:

This correspondence has been prepared as requested to report our observations regarding the repairs completed to the exterior walls outside of Apartment 109 at the Lincoln School Apartments in Hingham, MA.

INTRODUCTION

In accordance with your request, Building Envelope Technologies, Inc. (**BET**) visited the Lincoln School Apartments on September 17th, 2025 in order to review the exterior conditions of Apartment 109, specifically the recently completed repairs.

The building at 86 Central Street in Hingham, MA is a 3 level (above grade) structure that was reported to be originally constructed circa 1912 as a school and was later converted to a senior living apartment building. The low slope roof is covered with an insulated EPDM membrane roof system and the exterior walls consist primarily of red brick and stone mass masonry.

It was reported that there have been moisture related concerns affecting the bottom floor apartment at the North-East corner of the building for at least three years. Since the original site visit to review the conditions in January of 2025, repairs were reported to have been completed in August of 2025.

Overview of Apartment 109 (circled) – photo taken January 23, 2025

Overview of Apartment 109 (circled) – photo taken September 17, 2025

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OBSERVATIONS

This office arrived at the property at the scheduled time and reviewed the exterior wall areas outside of Apartment 109 at the rear right corner of the building. It was reported that since the original site visit in January of this year, an exterior brick masonry wall restoration project of limited scope was recently completed.

As noted in the memo dated February 18, 2025, the exterior walls of this building consist of solid red clay brick masonry construction with cement brick masonry at the interior wythe. Historically, cement bricks were less expensive to manufacture and were oftentimes used on the interior side of the masonry walls. This type of structural wall system is made up of multiple wythes of masonry, bonded together with header or rowlock bricks, which span multiple wythes and tie the structure together. The brick masonry consists of four wythes of brick which is approximately 16” thick on the first floor and three wythes of brick which is approximately 12” thick on the floors above.

The brick masonry appears to date back to the original construction, circa 1912. The brick masonry is constructed in a running bond pattern with Flemish headers every sixth (6^{th}) course. Wall embellishments include brick masonry arched headers above the windows on the first floor, cast stone window headers above the second and third floor windows, cast stone window sills, and decorative cast stone water tables and cornice.

After the memo dated February 18, 2025 was delivered, the Town of Hingham requested bids from contractors to complete repairs. The specific repairs to be completed on the exterior wall outside of Apartment 109 were to include:

- Thorough cleaning to remove all moss/algae growth
- Saw cut all mortar joints into solid material, to a minimum of 1”
- Repointing of the mortar joints, to include all joints in the brick masonry and around the cast stones up to and including the horizontal joint above the second floor water table with new mortar applied that matches the original color, texture, and profile
- Spot sealant application where missing or lacking around the windows
- Application of a clear, breathable, penetrating masonry sealer
- Ensure all repairs comply with Hingham Historic District Commission requirements

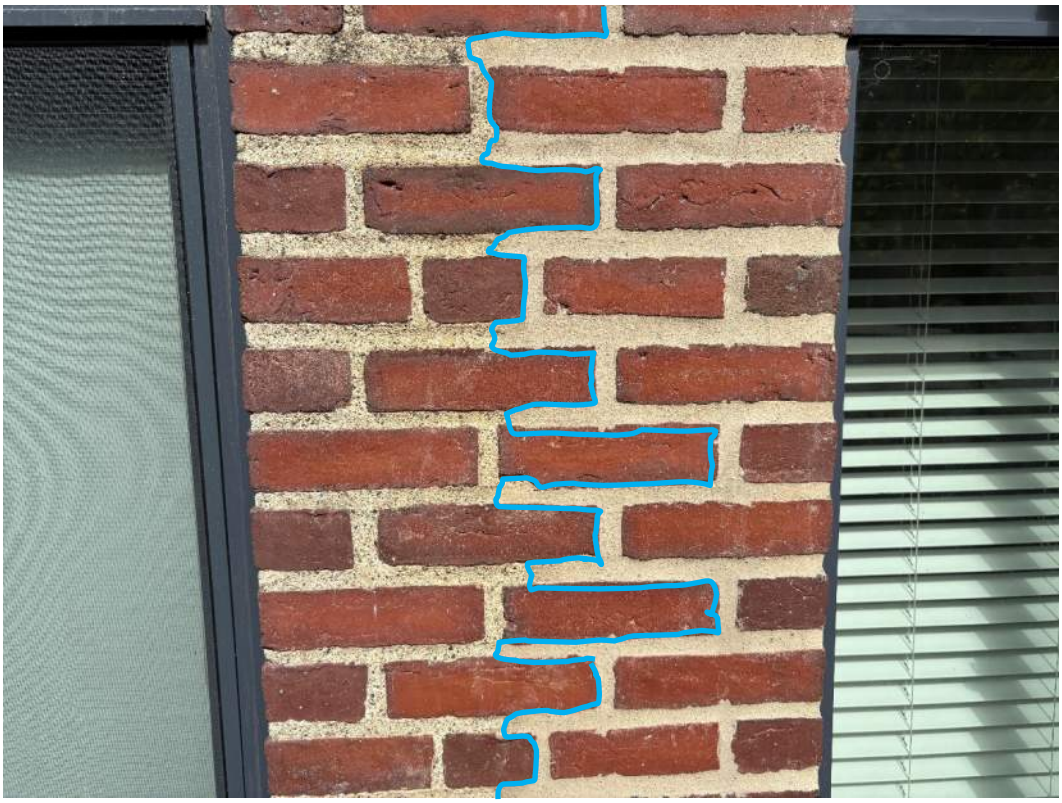
It was reported that the company that was contracted to complete the work was DeMelo Construction of Whitman, MA. DeMelo stated the products they used for the repairs included SpecMix Masonry Mortar (preblended mortar for repointing), SikaFlex-1A (color Capital Tan), and Prosoco Sure Klean Weather Seal Siloxane PD (pre-diluted).

At first glance, the ground floor brick masonry exterior wall on the rear of the building is notably cleaner and nearly free of efflorescence staining and moss/algae. Only small faint areas of the white, chalky stains were observed above two of the three rear windows.

Heavy staining on rear elevation – photo taken January 23, 2025

Majority of stains have been removed – photo taken September 17, 2025

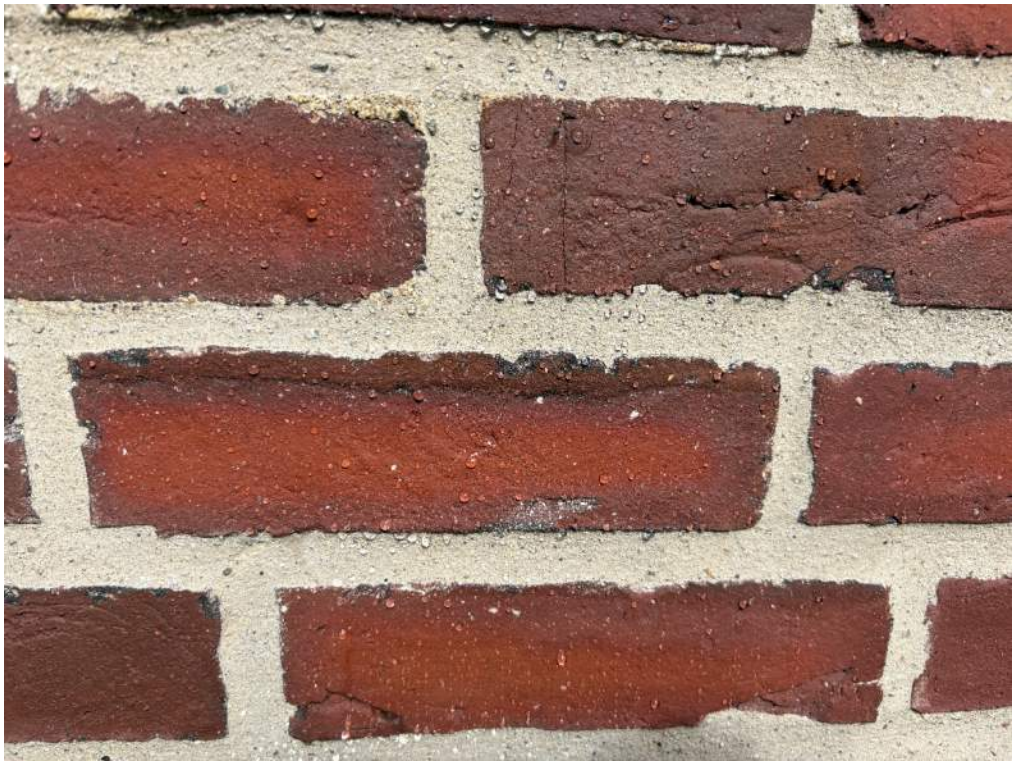
Upon examination, it was found that the brick masonry joints between the cast stones at the foundation level and the cast stone water table below the second floor windows have been repointed. Although it is unknown whether the workers removed the mortar to a minimum depth of 1", the new mortar appears solid and continuous with no cracking. A small hammer was used to test the strength and thickness of the new mortar in several random locations via hammer strikes. No cracks or chipping were produced, indicating the new mortar has been set to solid materials. If the substrate materials were soft/deteriorated, or if the new mortar was not pressed into the substrate, the hammer blows would typically crack the new mortar.



Wall area between windows with original mortar (left) meeting the new mortar (right)

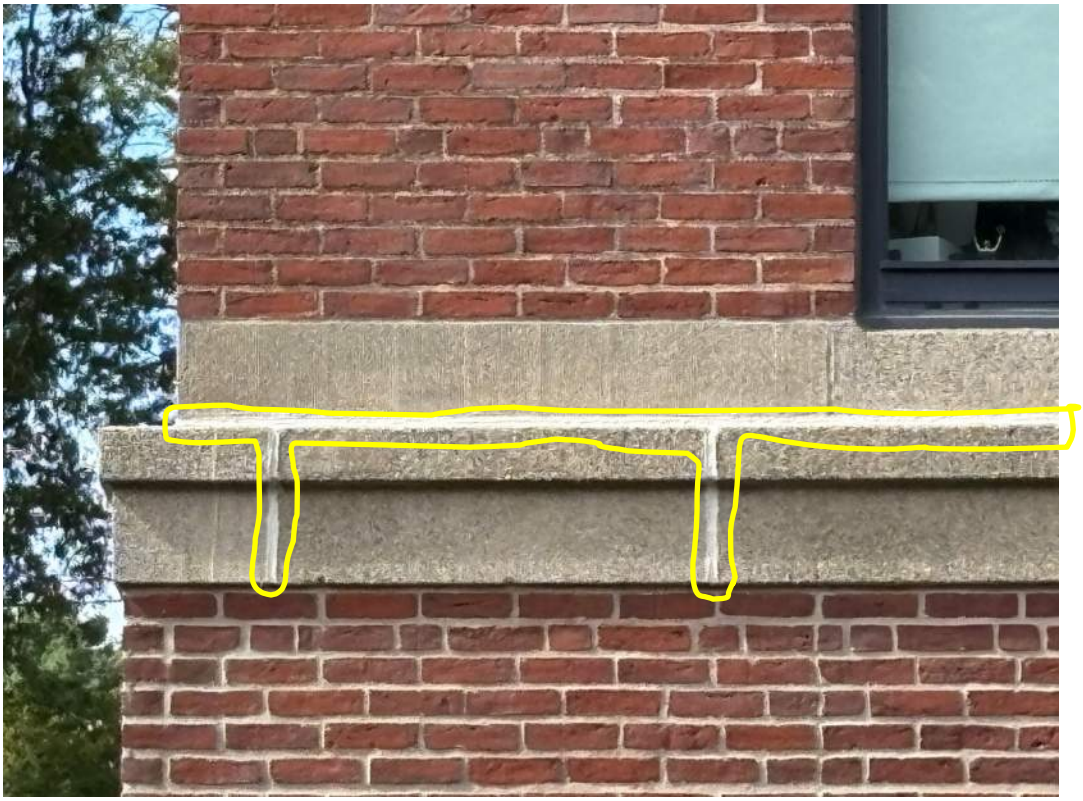
The newly applied mortar has less exposed aggregate than the original mortar, however it should be noted that the original mortar is heavily weathered. The color of the new mortar appears to closely replicate the original. It was also found that the new mortar was applied so that it is nearly flush with the exterior surface of the bricks.

Typical original weathered mortar joints on side elevation



Newly applied mortar joint outside Apartment 109

The vertical joints between the cast stones of the water table below the second floor windows above Apartment 109 have been covered with sealant. Further, the horizontal joint above the water table and cast stone above (above Apartment 109 only) has been covered with sealant. Two cast stones above the water table, one on the rear elevation and one on the side elevation have horizontal cracks that have been covered with sealant. It appears that the vertical sealant joints were not well tooled, leaving a rough appearance. It should also be noted that the color of the sealant does not match the color of the stone or mortar.



Sealant applied in vertical joints between water table cast stones and horizontal joint above water table

The sealant applied around the perimeters of the windows for Apartment 109 appears to be continuous with no obvious problems noted.

After reviewing the overall appearance of the brick masonry (cleaner than surrounding surfaces due to removal of moss/algae and most of the efflorescence, but with no discoloration), water was splashed onto the wall surfaces in a few random locations. The water immediately beaded up and rolled off both the face of the bricks and the mortar joints. Despite no obvious outward appearance such as discoloration (typically darkening) or change in sheen (i.e. glossy), a water repellent was applied.

Close-up photo of water beading (not absorbing) on brick masonry

The resident in Apartment 109 (Susan) opened her window near the conclusion of the evaluation. She mentioned that since the repairs had been completed (some time in August), she had not noticed any instances of water infiltration.

After the site visit a phone message (voicemail) was left with your office to provide a snapshot synopsis of the findings, as well as recommended next steps. The next step to help determine if the repairs were effective in reducing the potential of water infiltration should include water testing. The repaired areas should be tested via the spraying of water from a garden hose or spray rack for a minimum time period of 30 minutes. The water testing should be completed on both the side and rear elevations, at least one testing area per elevation.

Prior to the issuance of this memo, it was reported that a member of the maintenance staff conducted an impromptu water test by spraying water from a garden hose at the repointed brick masonry. The duration of the water test and the specific location where water was sprayed is unknown. It was reported that no instances of water intrusion were observed during the testing. However, it was reported that there was a significant rain event later in the same day in which interior water infiltration was reported in Apartment 109.

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CONCLUSIONS

Overall, it appears that the repair work that was completed on the exterior walls outside of Apartment 109 followed the direction and scope of work provided by the Town of Hingham. The mortar joints are solid and match the existing fairly well (final appearance may be reviewed by the Hingham Historic District Commission). The wall areas within the scope of work are significantly cleaner than their previous appearance, and a water repellant was applied. Therefore, the requirement of the provided scope of work appear to have been met.

However, it was reported that water infiltration occurred in Apartment 109 after a recent significant rain event.

RECOMMENDATIONS

Based on the fact that a localized restoration project was completed and the report that water infiltration occurred in Apartment 109 after a recent significant rain event, further investigation and additional repairs are warranted.

The next step should include controlled and systematic water testing of exterior walls. Water testing should be completed in multiple locations beginning at lower elevations where the recent repair work was completed using a spray rack to provide long term and distributed exposure to water. Water should be sprayed at the wall for a minimum of 30 minutes, but ideally 60 minutes. Upon completion of the water test, the interior of Apartment 109 should be monitored for at least another 60 minutes. After the monitoring period, another water test should be conducted at the second floor level. The process should continue to include the third floor as well, on both the rear and side elevations.

The purpose of the water testing is to determine if direct exposure to water spray over a period of time results in interior leaks. If so, the restoration project completed outside of Apartment 109 should expand to include the second and third floors.

This report shall not be construed to guarantee or warrant the existing building nor shall it be inferred that all conditions as associated therewith have been observed or recorded. This report is a cursory review of the building envelope concerns related to the moisture issues in Apartment 109 in order to determine the level of potential intervention necessary at this time.

We hope the above proves to be some assistance to you in the care, maintenance and preservation of the property. If, following your review, you should have any questions or if we can be of any further assistance to you in this matter at this time, please do not hesitate to contact us.

Respectfully Submitted,

Matthew Coulsey
Project Engineer