



April 14, 2023

Borough of Haddon Heights
625 Station Avenue
Haddon Heights, NJ 08035

Attn: Kelly Santosusso, Borough Clerk

Re: Evaluation of Report for
501 Station Avenue as Prepared by
Leake Engineering LLC
Dated May 12, 2022
Bach Associates No.: HH2023-0

Dear Ms. Santosusso:

SCOPE OF REPORT

As directed, the undersigned engineers performed an inspection of the above reference property on Monday, April 10, 2023 for the limited purpose of providing an independent evaluation of the May 12, 2022 report prepared by Alex Bruno, PE of Leake Engineering LLC for 501 Station Avenue, Haddon Heights NJ which is attached to this report for reference. It is further noted that no dismantling or destructive testing of any kind was performed.

INDEPENDENT OBSERVATIONS

We initially made observations from the first-floor space, noting the sloping and/or sagging floor joists.

We entered part of the basement through the staircase access on the first floor. This staircase provided access to the north-west rear corner of the basement which was approximately one-quarter of the building's footprint. The foundation was made up of flagstone foundation walls with mortared joints. The inside face of the foundation walls had parging installed at one time with white paint. A slab on grade was installed within this space and the bottom of the foundation walls all appeared to go below this slab on grade.



Photograph 1: Parging delaminating from the flagstone foundation wall

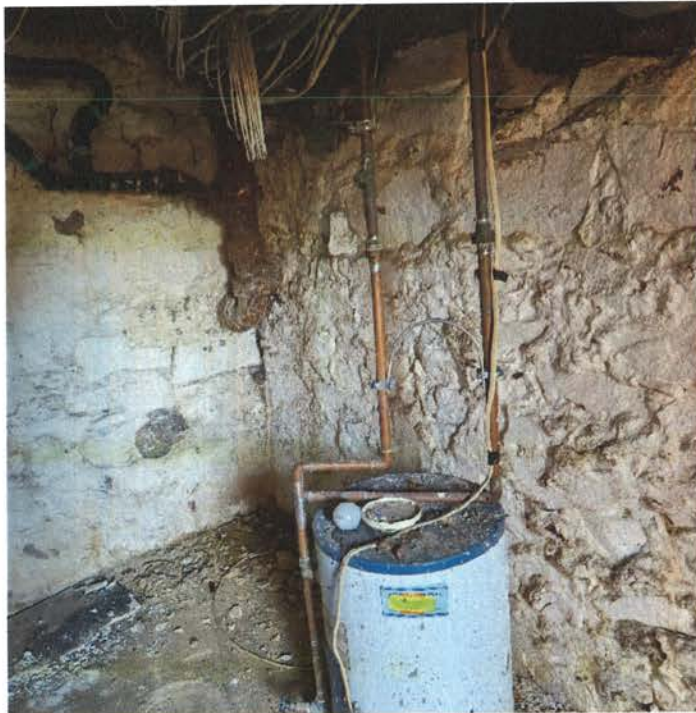
Within this space, there were some signs of moisture infiltration previously in the space (water staining on the slab and walls). However, at the time of our site visit, there were no active water infiltration.



Photograph 2: Signs of water infiltration and parging delamination

There were a few localized locations on the wall where water infiltration likely loosened the parging on the flagstone wall which has caused the parging to break loose. From the exposed flagstone foundations, the stone and mortar appeared to be in adequate condition with no signs of movement within the wall. Significant water infiltration through the wall typically results in softened and eroded mortar joints.

Access to the remaining portion of the basement was gained by a side Bilco door on the north-east side of the building. This door provided access to the remaining portion of the basement. The North corner of the basement appears to be where the bulk of the building utilities are located, including the electrical panel, hot water heaters and HVAC. This portion of the basement foundation wall was the same as previously observed, with flagstone foundation walls and a slab on grade. The walls appeared to be in adequate condition with no signs of wall movement or damage.



Photograph 3: Flagstone foundation wall adjacent to bilco access



Photograph 4: Flagstone foundation wall adjacent to bilco access

From this corner of the basement, walking to the front of the building, there is a step down to a dirt floor. This step down is a result of a partial dugout basement. The dugout portion of the basement is mostly localized to the middle of the building. There is a middle bearing flagstone foundation wall splitting the left and right sides of the building with a few openings within the wall to allow travel between the two sides. On the right side of this basement area, the original grade is still intact with a step down approximately 4 feet off the face of the foundation wall. This foundation wall appears to be in adequate shape with no signs of movement or damage.



Photograph 5: Flagstone foundation wall with original basement floor

Along the left and middle foundation walls, there are portions of the dugout basement which are directly adjacent to these walls, exposing the earth below the foundation wall. On the left foundation wall, this length is approximately 11 feet. At the middle foundation wall, it appears concrete was poured against the exposed earth under the foundation wall. Despite the dugout portion of the basement floor adjacent to these walls, there did not appear to be any visible movement in the flagstone foundation walls throughout the basement.



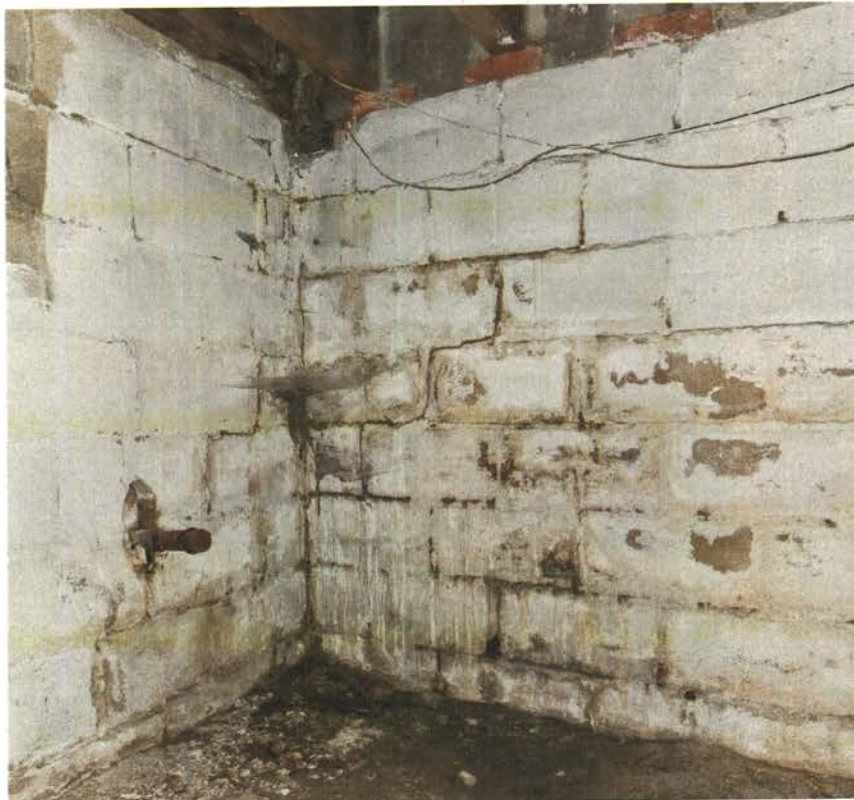
Photograph 6: Portion of exposed bottom of flagstone foundation wall

Directly adjacent to the middle foundation wall, there is a post which supports a column from the floor above. The footing under this post is exposed due to the dugout basement and is currently in an unstable position.



Photograph 7: Undersized and exposed column footing

The front portion of the basement was an addition that was added after the original construction. This portion of the foundation wall is constructed out of concrete masonry units (CMU). This CMU appears to be unreinforced and hollow and shows some evidence of movement at the top course along with gaps within the mortar construction.



Photograph 8: Front CMU foundation wall with water infiltration and step cracking

INDEPENDENT CONCLUSIONS

The existing foundation walls appear to be in adequate condition and require only minor structural repairs such as repointing mortar joints and repairing some of the larger openings which were made for duct penetrations.

The original flagstone foundation walls show little to no sign of movement and the mortared joints appear in adequate condition with minor signs of degradation. The local areas of soil excavations directly adjacent to the foundation walls have not yet disturbed the soil directly underneath the foundation walls. However, due to this exposure, we recommend that this issue be addressed immediately. This can be addressed by back-filling and recompacting these excavated areas, or by pouring a new structurally detailed concrete curb, to hold back the soil under the foundation walls.

The front CMU wall will likely require some areas of repointing and potentially grouting the hollow cells to restrain any future movement of the block wall.

The column adjacent to the middle bearing wall will require a new footing to be poured to properly support the building loads from above.

The water infiltration issue at the exterior walls can be addressed from the exterior of the building, by regrading and providing proper channels for the water to penetrate the surrounding soil away from the building.

SUMMARY

Based on the above and our review of the report prepared by Leake Engineering, we are in general agreement with their highlighted concerns. However, the extent of these areas of concern are very localized and would not require universal repairs to the foundations.

Regarding the specific repair recommendations and cost estimates contained in the Leake Engineering report, the undersigned engineers do not take exception with the recommendations nor with the costs outlined for performance of same as the costs are dependent on the means and methods of the specific repairs.

In the Leake Engineering report conclusion, it is stated that "the foundation for this building was compromised and deemed unsafe". The undersigned engineers disagree with this conclusion and opine that the building is currently structurally stable and that the recommended repairs outlined in the Leake Engineering report should be performed in a timely manner to mitigate any future structural degradation.

In addition, the Leake Engineering report conclusions states that "a feasible alternative to the recommendations above would be to demolish the building". It is agreed that a feasible alternative to performing the structural repairs outlined to the Leake Engineering report would be to demolish the building, but it is the opinion of the undersigned engineers that as the subject building is currently structural stable and therefore demolition is not required.

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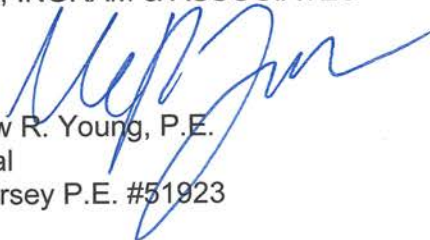
If you have additional questions, or if we can be of further service in this matter, please do not hesitate to contact us.

BACH ASSOCIATES, PC



Steven M. Bach, PE, RA, PP, CME
President
New Jersey P.E. #41507

BAKER, INGRAM & ASSOCIATES



Matthew R. Young, P.E.
Principal
New Jersey P.E. #51923

cc: Mayor and Council
Howard Long, Esq., Borough Solicitor
Dave Taraschi, Borough Administrator



LEAKE ENGINEERING, LLC

Leake Engineering LLC

101 W Eagle Rd #189
Havertown, PA 19083
484 380 5419

Project Address: 501 Station Ave, Haddon Heights, NJ 08035

Date: 05/12/2022

Scope of Work (SOW):

Engineer Evaluation. This inspection was completed on 05/11/2022 at the request of the owner to investigate possible structural issues observed.

Visual Structural Inspection. The building is a story commercial building with a stacked stone foundation and wood framing.

GOVERNING CODES:

1. International Building Code and Residential Code 2018 (IBC/IRC 2018)
2. AISC 14th Edition, Manual of Steel Construction
3. ACI 318-08, Building Code Requirements for Structural Concrete
4. ASCE/SEI 7-05, Minimum Design Loads for Buildings & Other Structures
5. AWC SDPWS-08, National Design Specifications for Wood Construction
6. ACI 530-08, Building Code Requirements for Masonry Structures

Findings Below:

Issue

Foundation. There are signs of water infiltration around the foundations. This water infiltration is caused by poor drainage and the soil conditions around and under the foundation. Water infiltration introduced into previously consolidated soil can induce secondary consolidation of the soil that will result in movement of the foundation.

Recommendation (Estimate \$50,000)

Underpin. The process of underpinning involves excavating small sections underneath the existing foundation footer to a depth that could better provide the necessary soil bearing capacity to support the structure on top of it. Typically a new footer is poured using reinforced concrete inside of the earthen form created by the excavation.



Issue

Foundation Undermined. Certain portions of the foundation for the building were undermined and are now unstable. Additionally the foundation for one of the main support columns was also undermined.

Recommendation (Two Options) (Estimate \$100,000)

1. **Underpin.** Underpin the foundation walls to the desired depth. The process of underpinning involves excavating small sections underneath the existing foundation footer to a depth that could better provide the necessary soil bearing capacity to support the structure on top of it. Typically a new footer is poured using reinforced concrete inside of the earthen form created by the excavation.
2. **Benching.** Benching the foundation would include pouring a 1'x1' reinforced concrete bench around the perimeter of the basement to provide the exposed soil with lateral stability.





Issue

Foundation Damage There are large holes in the foundation wall. These holes are the result of the installation of various mechanical, electrical and plumbing systems. These holes greatly affect the integrity of the foundation.

Recommendation (\$10,000)

Patch. Clean out the debris from the failing foundation wall. Install 3-#4 reinforcement bars going each way. Ensure the reinforcement bar is embedded into the adjacent wall a minimum of 3". Then form up the hole for concrete to be poured.



Issue

Beam Deflection. There is a beam installed in the basement which was intended to support the floor joists above it due to the floor sagging. This beam is deflecting for its purpose because of overload and deterioration.

Recommendation (\$5000)

Post/Footer. Support the mid-span of each beam section with a 4" steel column (HSS4x0.313) on top of a 24"x24"x12" reinforced concrete footer with 4-#4 reinforcement bars going each way. This new column should be connected to the existing beam and new footer with 4-½" steel bolts.



Issue

Joists Bearing Failure. The joists on the sides of the basement are compressing where they rest on the exterior wall. This type of failure is called a bearing failure and is the result of water infiltration on the exterior wall that is damaging the joists and causing it to compress. As a result of this compression the floors above the joists are starting to deflect and sag.

Recommendation (Two Options) (\$4000)

1. **Ledger.** Install a 2-2x12 ledger under the joists that are failing and attach the ledger to the wall using $\frac{3}{4}$ " bolts epoxy anchored into the foundation.
2. **Beam/Column/Footer.** Install a 2-2"x12" Beam under the deflecting joists where they rest on the exterior wall that spans a maximum of 10' The beam should be supported on either side by a 4" steel post on top of a 20"x20"x10" concrete footer with 3-#4 reinforcement bars going each way.



Issue

Joist Deflection (Sagging). The 1st floor joists are deflecting and causing the floor above it to sag. This deflection is the result of damage and/or overloading due to the installation of various mechanical and plumbing systems. As a result the structural integrity of the damaged joists have been compromised and will need to be reinforced.

Recommendation (\$4000)

Sister. Sister any joists that are deflecting. Deflection can be detected by horizontal cracks in the middle of the joist. Also sister any joists that are damaged. Sistering joists requires that a new wood joist be attached to the damaged joists in order to reinforce the area that is compromised. Sister the damaged joists with 2"x members that match the depth of the existing members. The sisters should be attached using 1/2" bolts every 1' staggered top and bottom or with large construction screws meant for sistering. The new sister should run the entire length or as far as practical of the damaged joist.



Issue

Stair Header Undersized. The header for the stairs leading to the basement is undersized and starting to sag as a result. Stair headers are natural weak spots in the framing of any floor and need to be supported properly. If not supported properly the wood members around the header will begin to sag over time.

Recommendation (Two Options) (\$2000)

Column/Footer. Reinforce the stair header with a column on top of a reinforced concrete footer. Support the corners of the stair header with 4" steels posts on top of 16"x16"x6" concrete footers with 3-#4 reinforcement bars going each way. The post cap and bottom should be a 1/2" steel plate with 4-1/2" bolts.

Sister. Sister the damaged joists with 2x10 members. The sisters should be attached using 1/2" bolts every 1' staggered top and bottom.



Conclusion. The foundation for this building was compromised and is deemed unsafe. A feasible alternative to the recommendations above would be to demolish the building.

We reserve the right to amend these conclusions if additional information becomes available. This conclusion is based on data gathered by a field inspection and represents our opinion based on a reasonable degree of engineering certainty with the evidence gathered. Any site plans or details provided with this report are not meant to be used as construction documents. If construction documents can be provided for an additional fee. If you have any questions please contact Alex Bruno at 484 380 5419 or alex.bruno@leakeengineering.com.

Respectfully,

Alex Bruno
Alex Bruno, P.E.