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KALAMAZOO, MI 49007

July 12, 2021

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Ms. Trisha Nesbitt
Treasurer
Van Buren County Treasurer's Office
219 E. Paw Paw Street, Suite 101
Paw Paw, Michigan 49079

Re: 5 Main Street Structural Evaluation
Hartford, Michigan
B/A Project #21100184

Dear Trisha,

This letter is to report on our structural assessment of the building located at 5 Main Street in Hartford Michigan. It is our understanding that the building was connected to a collapsed and now demolished adjacent building via a shared brick bearing wall.

BACKGROUND

The structure in review is a 100-plus year old structure with two stories. The building footprint is approximately 22 feet by 80 feet. The building consists of brick shared bearing walls with wood joist floor and roof framing. Floor framing consists of wood floor planks on 2x12 wood floor joists @ 16" on centers. The building includes a basement with stone laid walls. The first floor contained a commercial unit. The second floor contained residential units; one accessible by the adjacent building and one accessible by a rear stairway.

On May 28th 2020 the adjacent two story building to the east collapsed. The building at 5 Main Street and the adjacent building shared the adjoining brick wall. The collapsed building, excluding the shared brick wall, has since been demolished and removed. It is unclear if the demolished building included a basement. 5 Main Street was obtained by Van Buren County and closed off. As the stair to the street side second floor residential unit of 5 Main Street was located in the now demolished building, the unit was inaccessible.

Byce & Associates, Inc. was called upon to review the structural state of the building and provide recommendations based on our observations. To that end, we have conducted a site visit and recorded photos of all accessible areas. The accessible areas included: basement level, first floor commercial unit, and the second-floor residential unit. We were unable to observe the street side second-floor residential unit and the roof.

OBSERVATIONS

We made the following observations concerning the condition of the structure:

1. The basement appears to be in good condition. The basement extends the full length of the building with laid stone foundation walls up to the bottom of the first-floor wood joists. Most of the first-floor wood joists appear to be intact and in good condition. The basement at the south wall includes the exterior stoop, typical of buildings with this type of construction. It appears the basement was largely unoccupied
2. The structure of the second floor is largely covered by ceiling. There was no significant settling of the second floor from visual inspection. The first-floor ceilings in the commercial space are apart from the second-floor framing, and so have not impacted the condition of the joists.
3. The roof framing is largely covered by ceiling. The original roof framing appears to consist of wood joists @ 16" on centers. Below the roof joists appears to be wood ceiling joists with a hard ceiling lid and insulation above. It is unclear if the hard ceiling is hung from the roof joists. Below the older hard ceiling is a lay in ceiling. There are a couple of skylights that appear to have been part of the original framing. During the site visit, there were no signs of water damage, though the season was notable dry.
4. The exposed shared brick bearing wall is visible from the outside. The brick is uncovered and exposed to the elements. The joist seats from the collapsed building are visible. At the base of the brick wall, there is a wood plate that runs the full length of the building. This wood plate is rotted and, in many cases, falling apart. It is unclear how far into the brick wall the wood plate extends, but we believe all but interior brick course bears on the wood plate. Much of the brick directly above the wood plate is loose with failed or deteriorated mortar joints.
5. The adjacent collapsed building has been demolished and removed. The site appears to have been infilled with sand. We are not able to confirm that there was a basement, but we expect that there was. If this is the case, the existing basement wall is being exposed to lateral soil pressure that it may not have been designed for.

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RECOMMENDATIONS

Based on our observations we recommend the following:

1. Provide thru bolt connections between the now exposed brick wall and the wood joist framing at the second floor and roof elevations. See attached detail.
2. Replace exposed wood plate at the base of the brick wall with brick and mortar to match existing construction. There are also many loose bricks at the base of the wall that need to be removed and reset. See attached detail.
3. Cover the exposed brick with siding to protect it from the rain and potential freeze/thaw damage. One option for covering the wall would be to anchor horizontal wood furring strips to the brick wall at about 4'-0" on center and cover the wall with vertical metal siding. Rigid insulation could be added between the furring strips as well. Design of these details for cladding the wall is beyond our scope of this report; however, we can assist with this effort upon request.
4. Investigate the roof for any water damage and repair or replace any roof framing that has become damaged. We were unable to observe the condition of the roof covering itself, but suspect that replacement of the roofing will be required.

We recommend a construction budget for the above recommended repair work of \$75,000 that would include drawings and details for the repair work.

If you have any further questions, please feel free to call.

Sincerely,
BYCE & ASSOCIATES, INC.



Report Reviewed By:
Bryan Webster, PE, NCEES, LEED AP
Structural Engineer, Vice President



Report Prepared By:
Peter Oudsema, PE, LEED Green Associate
Structural Engineer

c: Enclosure

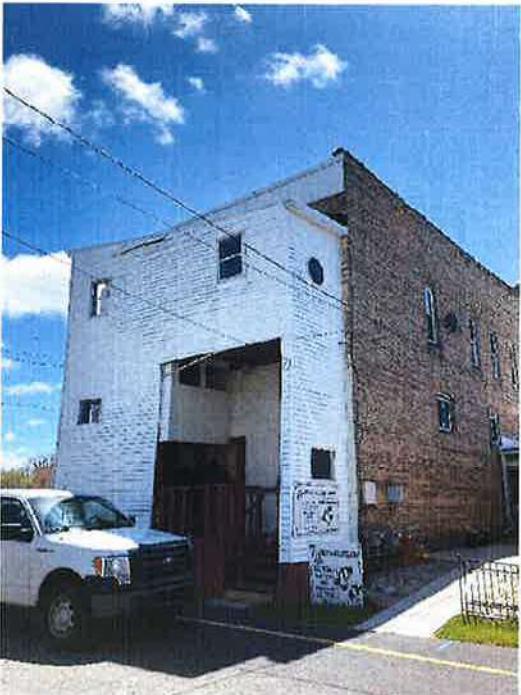
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Photograph #1: Front Entrance



Photograph #3: Basement Wall



Photograph #2: Rear Entrance



Photograph #4: Front Entrance Stoop

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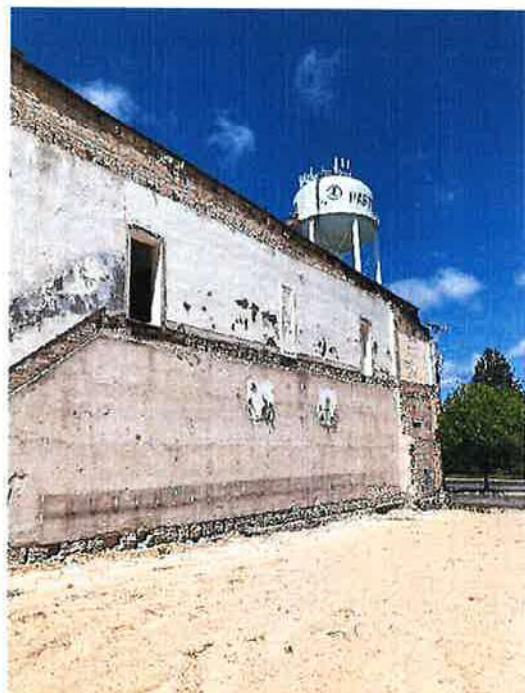
Photograph #5: Above First-Floor Ceiling



Photograph #7: Exposed Brick Shared Wall



Photograph #6: Roof Framing & Ceiling Joists



Photograph #8: Exposed Brick Shared Wall

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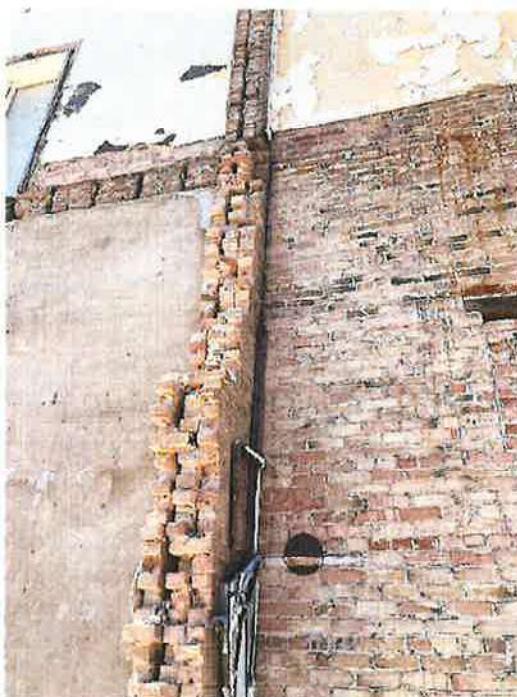
Photograph #9: Exposed Joist Seats



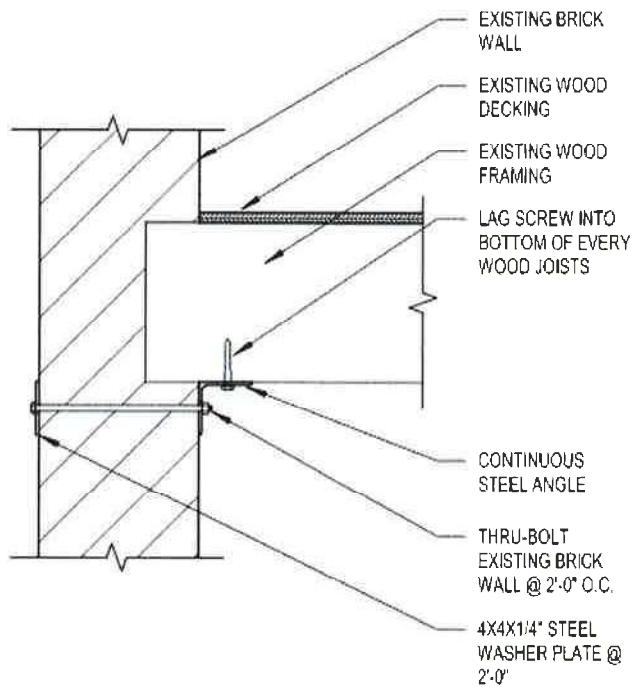
Photograph #11: Rotted Wood Plate



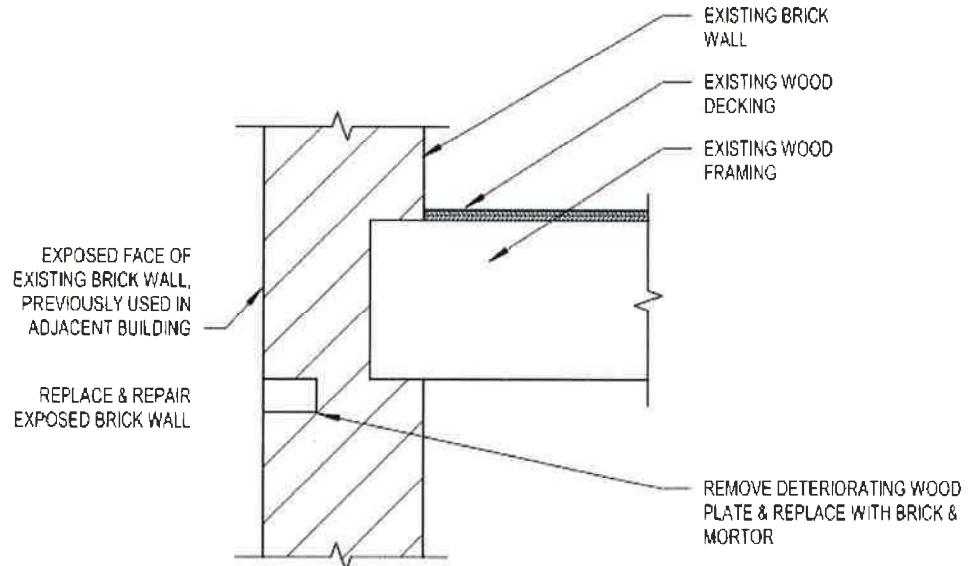
Photograph #10: Rotted Wood Plate



Photograph #12: Exposed brick



BRICK WALL BRACING CONNECTION DETAIL



BRICK WALL REPAIR DETAIL