

Tuesday, August 30th 2022

Mr. Michael VanOverbeke
79 Alfred St
Detroit, MI 48201

Re: Inspection of Brick Structure
2827 John R St
Detroit, MI

Mr. VanOverbeke,

On August 16th I visited 2827 John R St in Detroit MI to review the condition of the brick structure. Also present on-site at the time of the visit were Michael Brady of AM Higley and Michael VanOverbeke, the building owner. The purpose of this letter is to communicate the current condition of the structure at the subject address. For this letter, it is assumed that the east side of the building is parallel to John R. Further, the review focused on the north portion of the building, the Carriage House, as the south portion of the structure was previously approved to be removed as part of the future building proposed for this site.

Description of structure:

The Carriage House has exterior walls built of multi-wythe unreinforced brick. There is one internal brick wall perpendicular to the north wall extending to the middle of the building. The structure originally had one elevated floor. An addition was constructed south of the Carriage House. This structure consists of two spaces – one a multi-wythe brick bearing wall construction and the second with concrete masonry unit block walls with brick veneer. Both additional areas are in a failed state and were previously approved to be demolished.



Picture 1: View of the Interior of the Carriage House



Picture 2: View of Interior of Carriage House

Existing Condition:

There is extensive damage to the Carriage House including the loss of the roof and most of the second floor. Evidence of fire damage can be seen on remaining wood window lintels and floor and roof joists. There is significant vegetation growing on the exterior of the north wall and the exterior and interior of the east wall.

Statement of Findings:

The Carriage House is in a failed state and is slowly collapsing. The rate of collapse appears to be increasing. It is not safe to enter the building to do the work required to stabilize the walls as the work will more than likely cause the walls to fail. A controlled demolition of the structure is required to prevent an uncontrolled collapse.

The Carriage House is in a failed state because:

1. The walls are currently unstable (see page 3).
2. Elements of support have been removed (see page 4).
3. The foundations appear to be undermined (see page 10).
4. The brick and mortar are no longer able to resist the design loads (see page 12).

Stability of Walls

When the Carriage House was originally constructed the roof braced the top of the wall and the second floor braced the wall at approximately mid-height. Without the roof and floor, the walls are cantilevered from the foundation level. As the wall is unreinforced and not designed to act as a cantilever, the brick is being stressed in ways it was not originally intended to be stressed. This has led to significant movement of portions of the walls. While it was unsafe to climb on the walls to measure the amount of movement, the movement is large enough to be seen with the unaided eye. Further, observations over the past months have shown increases in the wall movement indicating that the structure continues to deteriorate and is not in a settled position.

Wall movement was noted to be most extensive in the following locations:

- a. The gable in the North wall is leaning toward the north (exterior of the building).
- b. The gable in the South wall is leaning toward the north (interior of the building).
- c. The gable in the East wall has already collapsed and the remaining portions of the wall lean toward the East (exterior of the building).
- d. The top of the West wall is leaning toward the east (interior of the building).

The remaining portions of the roof and floor may be supporting the walls in unintended and unpredictable ways. Removing these members will accelerate the collapse of the structure.



Picture 3: East Wall of Carriage House with Collapsed Gable



Picture 4: Leaning Gable in South Wall.

Missing Elements of Support

When originally built, the brick above the approximately 26 openings in the walls was supported by solid wood lintels. Of these lintels, all but 3 show extensive damage from either fire, water, or both. The three remaining lintels are in fair condition. Above the windows, the bricks are cracked and the bricks between the top of the opening and the cracks are slowly deflecting, or in the worst cases already falling. Eventually these portions of the wall will collapse.



Picture 5: Missing Lintel at Opening in South Wall.



Picture 6: Missing Lintel at Opening in South Wall.



Picture 7: Crack Below Window in West Wall



Picture 8: Crack Between Windows in West Wall



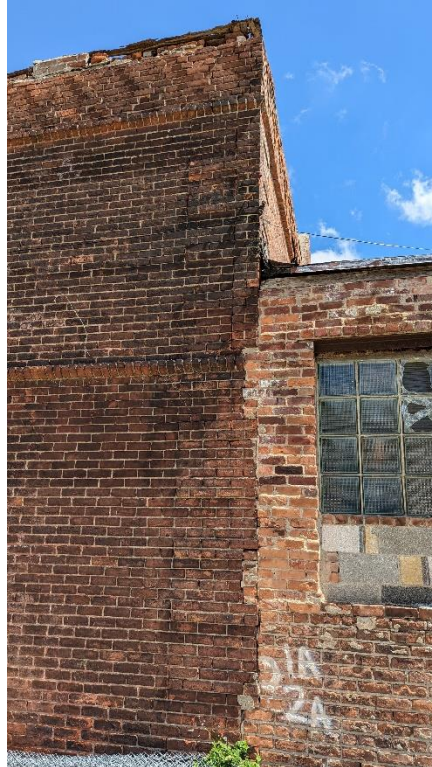
Picture 9: Crack Above Window in North Wall

The large number of openings in the walls reduces the stiffness and integrity of the walls and have caused the walls to twist as they move. This is visible in openings that are no longer square and in walls that are moving in different directions at the top and middle of the walls.



Picture 10: View of South Wall with Non Square Openings

The intersections of the walls at the corners have cracks running vertically along one of the intersecting walls. As the walls move out at the top they pull away from the intersecting wall. These cracks are visible along the full height of the wall.



Picture 11: Crack Along Intersection of Walls at Southwest Corner.



Picture 12: Crack Along Intersection of Walls at Northeast Corner.



Picture 13: Crack Along Intersection of Walls at Northeast Corner.

Undermined Foundation

The geotechnical investigation found that the foundations for the Carriage House walls are stacked stone. The owner of the building indicated that for a time a water line was pouring water onto the building floor. A sinkhole is present in the alley north of the building in the vicinity of this pipe. It appears that this prolonged exposure to water has undermined the foundations. Further investigation into the damage to the foundations would require unsafe excavation at the inside and outside of the building walls. This investigative process could lead to further building damage.



Picture 14: Loss of Soil at Foundation of the Center Wall.



Picture 15: Sinkhole in Alley.

The interior brick wall in the center of the north wall is deteriorated in a similar way to the exterior walls. The lintels have been damaged and have significant section loss. This has led to cracks in the mortar joints above the north opening. The southernmost pier in this wall is deteriorating causing it to lean to the west near the floor and is in danger of collapse. This buckling has caused the wall to move at the top toward the east.



Picture 16: Wall in Center of Building Missing Lintels.



Picture 17: Wall in Center of Building.

Deteriorated Brick

The brick and mortar is weaker than modern brick construction would be. The brick is more brittle than modern brick and is not made in a way that is compatible with reinforcing. The mortar is weak and can be removed using fingers. The lack of strength of the brick has been enhanced by prolonged exposure to the elements.

Some of the deterioration of this structure is increasing the exposure to the elements. The collapsed gable on the east wall has caused advanced deterioration of surrounding brick as it opened up the top of the wall allowing water to infiltrate the brick. The continued exposure to the elements are causing the bricks to continue to fall off the wall.

In addition to the damaged location at the east wall, the deterioration is most noticeable at the top of the walls, above openings and along both vertical sides of the opening on the east end of the south wall. Because it is unsafe to climb to the upper elevations of the wall it is not possible to ascertain the condition of these bricks now exposed to weather. It is likely that the infiltration of water and freeze thaw cycles experienced in the winter have caused the brick to deteriorate.



Picture 18: Loose Brick at Opening in South Wall.

Conclusions

The building is in a failed state and should not be entered. With the unreinforced walls cantilevered from the foundation, the remaining structure is unstable. While significant portions of the roof and elevated floor have been damaged and removed, it is possible that the remaining wood joists are providing some support for the walls. Cleaning up the building and removing these pieces, which is required to install bracing, could further destabilize the structure. Additionally, the south portion of the structure is bracing the south wall of the Carriage House. Work to demolish this south portion of the building will impact the south wall of the Carriage House. Further, work to install foundations inside of the Carriage House will destabilize the foundations and the walls. Finally, vibrations related to construction activity north of the alley will likely further destabilize the walls of this structure.

It is my recommendation that this building be demolished in a controlled manner before it collapses.

If you have any questions, please do not hesitate to contact us.

Sincerely,



David Bendert, P.E.
JDH Engineering, Inc.
State P.E. Lic. No. 57046



Appendix:

Following are additional pictures showing the advanced deterioration of this structure.



Picture A. 1: View of South Wall.



Picture A. 2: View of East Wall



Picture A. 3: View of North Wall.



Picture A. 4: View of West Wall.



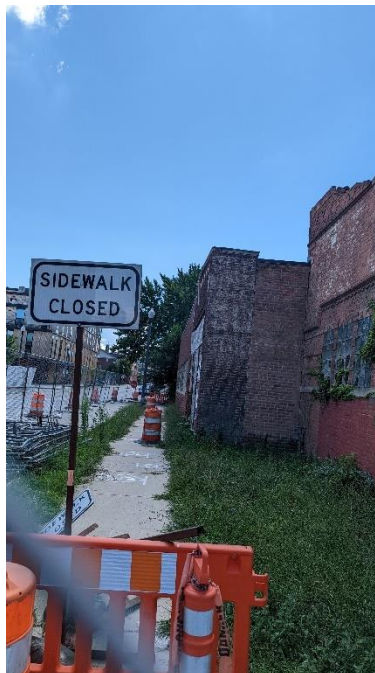
Picture A. 5: Exterior View of North Wall.



Picture A. 6: Interior View of the Carriage House.



Picture A. 7: Interior View of the South Addition.



Picture A. 8: Failed Façade of the South Addition.