Engineering Analysis

Building Evaluations
112 - 113 S Madison
Bloomfield, IA

for:

City of Bloomfield
tammy.roberts@cityofbloomfield.org

Attn: Tammy Roberts

by:

Tometich Engineering, Inc.
10501 Buena Vista Court
Urbandale, Iowa 50322
Phone: (515) 280-8022
Fax: (515) 727-9124

e-mail: jet@tometichengineering.com
web site: www.tometichengineering.com

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Building Inspection for:
112 and 113 So. Madison
Bloomfield, IA

Purpose and Scope:
The purpose of this inspection is to evaluate the general condition of the buildings. This will include a general review of the International Building Code Requirements.

General Information:
The buildings are located at 112 and 113 Madison, Bloomfield, Iowa. They were originally constructed about 120 years ago. The buildings are 22' wide each, they vary in length but in general are about 100' long. They have not been upgraded for accessibility.

Site:
The buildings are facing to the east. The land around the building slopes in general from east to west. The water off of the roof of the buildings slopes to the alley side (south) and is collected in gutters and discharged into the alley.
**Interior and Exterior Walls:**

The building has load bearing shared walls, these walls run north-south and support the floor joists that run east west. The exterior walls are the east and west walls. These walls are not plumb and are leaning away from the building. The front wall (east wall) is bulging at the center about 3”. The front wall also has a lintel beam support over the glass, this is supported by steel and masonry columns. These columns are also leaning. This presents a dangerous situation. The doors and windows are all in need of replacement.

3, 4. Views of the front facade

5, 6. Views of front facade leaning toward the street

7, 8. Front facade details
Roof:
The roof is a wood framed roof with a rubber membrane. This membrane is less that 10 years old and is in good condition. Numerous roofs in the downtown area were replaced and all appear to be doing well. The roof membrane comes up and over the top of the parapet which is a good way to protect water from going down the wall.

9, 10. Movement of the front facade

11, 12. Wall is out of plumb by about 1 1/2" in 6' or a total of 3"

13, 14. Verification of lean
Floors:
The floors on the second level are solid and in good condition. The only concern of these floors is that the supporting wall below is failing. The one other concern is that the front wall is migrating away from the floor. Although this is a wall problem, not a floor problem, it is still a concern.
The floors on the main level are also in relatively good condition. They are wavy in areas because of the varying supports in the center of the basement. The obvious area of concern is where the common wall has failed, this has no support for the floor and it is literally hanging there. The ends of the floor joists do show sign of rot, but it can be repaired.
The floors in the basement are a combination of poorly placed concrete and dirt. The floors are not usable with the exception of placing mechanical equipment on. The basement in general has a very high humidity level from the floors being exposed.
19, 20. Views of interior

21, 22. Views of interior, floor slopes

23, 24. Movement at front door and southeast corner
25, 26. Common wall movement and damage

27, 28. Common wall from opposite side

29, 30. Failure of stairs leading to mezzanine apartment
37, 38. Upper apartment

39, 40. Crack in second floor wall at area of failure

41, 42. Movement of wall away from second floor
43, 44. Views of roof

45, 46. Second floor at south building

47, 48. Second floor at south building

Foundation:
The foundation of the buildings is of stone masonry. The mortar in the stone masonry is deteriorating due to age and high humidity. This is in poor condition and is compromising the support of the upper walls and associated upper floors and roof. The foundation has already failed in the front of the building at the common wall, it is only a matter of time before it all fails. The failure at the front wall is a danger to public due to the upper walls collapsing into the sidewalk area.
49, 50. Foundation deterioration of south building

51, 52. Foundation deterioration at south building

**Evaluation and Assessment:**

The building is in poor condition and is a danger to the public. The front sidewalk needs to be protected for 20' in each direction of the failure area which is the common wall between 112 East Madison and 112 East Madison.

To repair the building numerous issues need to be taken care of. First and foremost, the wall needs to be replaced. The procedure to do this needs to be clearly delineated in drawings prepared by a structural engineer familiar with this type of construction. In general, the roof, second floor and main floor need to be temporarily supported on both sides of the failure point. The wall needs to extend at least 6' beyond the failure and possibly farther as determined by the engineer. The damaged masonry and building materials needs to be removed. Once that occurs, a new wall can be built. The wall could be constructed of wood framing if the owner wants to be economical or of masonry if the owner wants to be historically correct. Once the new wall is installed and secured, the front façade needs to be properly tied back to the re-built structure. This will secure the building and then be able to be used, but there are many items that still need done.

The next items that needs to be completed is the tuck pointing of the foundation. The mortar in the walls has deteriorated to sand and is in poor condition. As this continues to fail, it will cause collapse of the upper wall as has already happened at the common wall. The procedure for this repair is to
remove the loose masonry with high pressure water or air. Once the walls are cleaned and exposed, a mason familiar with this type of construction needs to tuck point and back [plaster the walls with cement mortar. Next, the center support wall needs to be restructured with new footings, posts and a new, properly engineered beam. All of the framing needs to be inspected to make sure none of the joists are rotted and are secure in the joist pockets. To protect this work, it would be wise to dehumidify the basement. A new concrete slab would help the area be usable for storage. The next item is masonry restoration of the front and back walls. There are numerous loose bricks, deteriorating mortar and items that need repaired or replaced (doors and windows). Obviously all of the aforementioned items are very expensive. A separate letter discussing these issues will be written and provided to the City to understand the choices and the implications of repair versus demolition.

**Update: June 17, 2020:**

The building is still in a failure mode and is still in need of repair. The walls have shifted slightly and are continuing to fail. This will continue until complete collapse occurs. When complete collapse occurs, the buildings will not be salvageable.

53, 54. Current views of buildings

55, 56. Bulge in front of building
65, 60. Failed common wall

67, 68. Interior views of 112 S Madison, failed wall and good wall to the west

69, 70. Foundation views from 113 S Madison

71, 72. Foundation views from 113 S Madison
73, 74. Foundation views from 112 S Madison

Recommendations:

It would be wise to test for asbestos, if the building has asbestos and it is not removed the demolition debris will have to be considered contaminated. This will significantly increase the cost of demolition. Getting the building tested and getting the asbestos removed is critical. Depending on where the asbestos is, it may be necessary to stabilize the building prior to asbestos removal. Once the asbestos is removed, the choice to repair or demolish the buildings and be made. The general repair concept is to shore up the floors and the roof on each side of the failure, then remove and replace the wall that has failed. The wall would need to be replaced from the foundation up. It will be difficult to salvage the front façade during this procedure. It most likely that it would be easier to remove and replace than to salvage. It may be possible to re-lay the interior wall and tie the front façade wall to it as it is re-laid. This procedure may work but we not guaranteed. Once this area is stabilized, the balance of the building can be repaired. The foundation walls need to be cleaned and back plastered with cement plaster. The basements need de-humidified. The main floor and second floor need to be updated with new mechanical, electrical and plumbing. New windows, doors and interior finishes would also need to be implemented. The roof is in good condition and would not need replaced in the near future. The finishes and systems in the 112 S. Madison are in better condition than 114 S Madison. It may be wise to discuss the situation with the Sinclair’s, they just recently remodeled the 114 S Madison and will have insights to the costs and opinions on how it will affect their building.

With that in mind, the other choice is demolition. The demolition costs will be significant, about $40,000 - $70,000 (assuming the asbestos has been removed) per building. After the demolition is complete, the site would need to be filled and leveled. The adjacent buildings walls are "common" walls and not intended to be exposed. The walls would need to be repaired and covered with an exterior finish. These additional costs need to be considered when making a decision for demolition or re-construction.
Under separate cover is a general report on the options provided for the buildings. The final recommendation is to stabilize the building, remove the asbestos and hire an architect that is skilled at restoration of older buildings. Tometich Engineering can help facilitate this by providing drawings for the stabilization and repair of the wall and also providing names of recommended architects for this type of work. Since there is Federal and State money for these types of projects, it is important that the architect be familiar with these programs.

Disclaimer:
This was a visual inspection. Numerous areas are not exposed to view. Internal deterioration may not be detected by a visual inspection. The writer assumes no responsibility to those items which were not exposed to view or were not present at the time of inspection. The mechanical, electrical and plumbing systems in the residence were not reviewed as a part of this inspection. Items pertaining to these systems are not included in this report. Asbestos and Radon were not tested for and are not included as part of this report.

Please call if I may be of further assistance.

Certification:

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly Registered Professional Engineer under the laws of the State of Iowa.

Signature: [Signature]

Date: July 6, 2020 Registration #: 11121

My Registration Renewal Date is December 31, 2018