April 10, 2023
2023000.04

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151 Lincoln Way East
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Structural Observation Report

24 Lincoln Way East – Massillon, OH

GPD Group is pleased to present this Observation Report from our visit to the retail/commercial property located at 24 Lincoln Way East (LWE), Massillon, Ohio on March 13, 2023.

The objective of the visit was to visually assess the building with respect to the recent demolition of the adjacent property. Our observations were limited only to the building's structural system(s). Portions of the structure that were not observable due to limited access, or obstructions (e.g., architectural finishes, furnishings, and equipment) are excluded from this report. No testing, invasive inspection, or exploratory demolition of any kind was performed. Additionally, a full in-depth structural analysis of the structure was not performed.

Building History and General Description

Architectural design documents were not available for this study. The following description is based on site observations.

Anecdotal and historical photo evidence suggest that the original construction dates from the mid-to-late-nineteenth century. The original building was constructed as four main segments separated by brick masonry party/common walls. The main three-story massing of 24 LWE is the easternmost segment of the original four building segments (See Figure 1).

***Figure 1**: Aerial View (Pre-Demolition of 14 LWE and 20 LWE). Image is from Google Earth.*

Following a partial collapse of 14 and 20 LWE in mid-January 2023, the City of Massillon received a letter from John Patrick Picard Architect Inc. on 1/27/2023 that asserted an urgency in the matter of public safety and the structural stability of 14 and 20 LWE. The letter recommended for the immediate shoring and reinforcing of the exterior walls and floor systems of 10 and 24 LWE. In late January of 2023, 14 and 20 LWE were razed.

Building Observations

The main structure of 24 LWE is approximately 60-feet long x 20-feet wide and consists of four total occupiable levels; a slab on grade basement and three wood-framed upper floors. It is worthy to note, a wood-framed ceiling is layered between the third floor, and the shallow, mono-slope wood-framed roof. The north (rear) section of 24 LWE (likely not original) consists of a crawl space, two wood-framed floors and a wood-framed roof. The wood framing generally spans in the east-west direction and is supported by brick masonry bearing walls, including the remaining west party/common wall.

The now-exposed west wall, consisting of three-wythes of brick, is in poor-to-moderate condition. Despite recent masonry repairs after the January demolition (patching and filling of joist pockets, etc. on the 20 LWE side of the wall), wall cracks, voids, and penetrations remain in the wall. Additionally, the original bricks and mortar joints are in various states of deterioration.

At the second floor, a doorway in the west wall, originally providing passage between 20 LWE and 24 LWE, remains unsecured.

At the third floor, a separation between the floor framing and the south façade was observed.

The temporary shoring, extending from basement floor slab to the third-floor ceiling framing, was installed parallel to, and approximately five-feet from, the west wall. Supplemental angle brackets and bracing were installed at the second floor, third floor, and third floor ceiling. No bracing was observed at the first floor or roof.

The following general observations describe the components that were installed to stabilize the west wall of 24 LWE prior to demolition of the adjacent structure. Refer to Figure 2 for general locations of brackets and bracing at the west wall.

Second Floor

- A 20-foot length of steel angle framing was installed connecting the south end of the second-floor framing to both the east and west walls. Each angle was connected to the brick masonry with 3/4” diameter threaded rod and to the floor framing with what appeared to be 3/8” diameter lag screws. The spacing of the rods and screws were installed at approximately 2’-8” on-center. It is assumed that the threaded rods were installed utilizing a screen-tube adhesive system.
- Two horizontal steel angle bracing connecting the west wall and the south façade were installed equally spaced between the second and third floors. These braces were anchored to the masonry wall(s) with ¾” diameter threaded rods similar to the steel angles along the floor.

Third Floor

- Various lengths of steel angle framing were installed connecting the third-floor framing to both the east and west walls. The connection of the angles to the brick masonry and wood floor framing was similar to the connections as noted at the second floor.
- A series of horizontal steel angle brackets connecting north-south walls to east-west walls were installed between the third-floor and roof. Two braces were installed in both the northwest and southwest corners and a single brace was installed in the southeast corner.

Third Floor Ceiling

- Various lengths of steel angle framing were installed connecting the ceiling framing to both the east and west walls. The connection of the angles to the brick masonry and wood ceiling framing was similar to the connections as noted at the second floor.

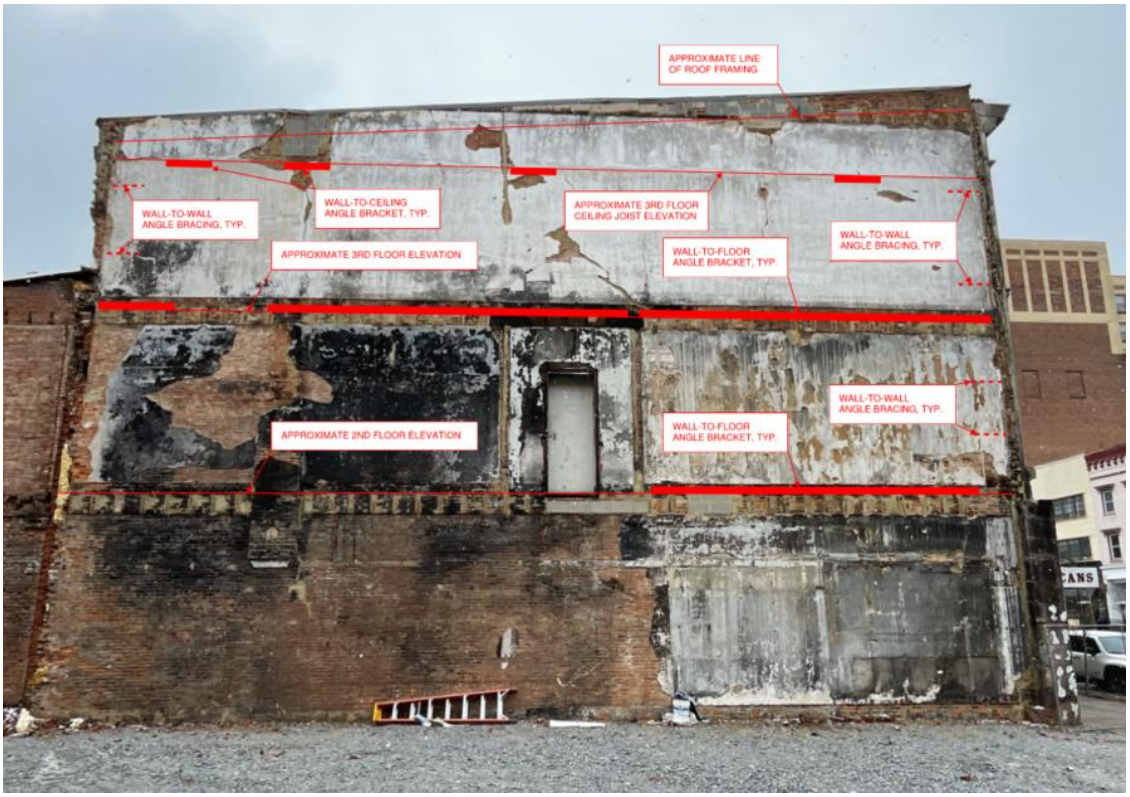

***Figure 2**: 24 LWE West Wall Elevation – Approximate Locations of Angle Brackets and Bracing.*

Conclusions and Recommendations

In general, the wood framing (exposed to view) appears to be in good condition. As was typical practice at the time of the original construction, the floor and roof joist framing components were not mechanically fastened to the interior common walls and only relied on friction for stability. Floor framing was set into masonry pockets, thus providing little-to-no active lateral support to the common walls. This is an important item to consider since the west wall is now required to perform in a way in which it was never originally designed.

Although it appears that efforts to stabilize and laterally support the west wall to complete the emergency demolition of 14 and 20 LWE were successful, the current configuration of angle brackets and bracing is not likely sufficient to resist the code-prescribed loads required to be resisted by the now-exterior west wall.

General comments on potential deficiencies include:

- Deteriorated and inconsistent masonry construction makes wall performance challenging to predict.
- No lateral support of the west wall appears to exist along the northern end of the second floor.
- No consistent lateral support of the west wall appears to exist at the third-floor ceiling.
- No lateral support of the west wall appears to exist at the roof level.
- Except for the noted bracing at the intersections at the east and west walls, no continuous lateral support appears to exist at the south façade. As noted previously, a clear separation of the floor framing and the south façade was observed at the third floor.
- Regardless of angle bracket and bracing locations, resistance capacity of the adhesive anchors used to connect steel components to the west and south walls is unknown. Factors contributing to the lack of reliability of the anchors includes the age, observed deterioration, and inconsistent nature of the in-situ masonry construction.
- Like the adhesive anchors noted above, the resistance capacities of the lag screws used to connect the steel angles to the floor framing are unknown due to the unconfirmed screw size/length and the end/edge distances of the screws installed into the 2x narrow face of the wood joists.
- Incomplete masonry repairs and weatherproofing presents opportunities for water intrusion into the building and continued masonry deterioration.

General recommendations include:

- Install fall protection at the second-floor doorway in the west wall (e.g., permanently seal or provide a guardrail system).
- Due to the significant alterations to the building resulting from the demolition of approximately 50% of original construction, retain the services of a structural engineer to evaluate remaining gravity and lateral resisting systems to address compliance requirements of the current building code. This evaluation, at a minimum, will likely include the following:
    - Evaluate the basement wall for lateral earth pressure. After demolition, the adjacent basements of both 14 and 20 LWE were backfilled.
    - Develop connection details that will provide lateral support to the west wall. Multiple solutions could be developed.
        - To make permanent use of installed angle brackets and braces, confirm in-situ adhesive anchor and lag screw demand-capacity ratios (e.g., pull tests for adhesive anchors).
        - Develop connections (e.g., plated thru-bolts) to positively connect the masonry walls to the floor and roof framing.
    - Due to the observed separation, evaluate the existing lateral support of the south façade and develop repairs as required.
- Develop a comprehensive masonry repair and waterproofing program to minimize future water intrusion and masonry deterioration.

- Until a more rigorous engineering analysis and repairs can be completed, it is recommended that shoring should be utilized in 24 LWE.

- Prior to completing a more in-depth evaluation of the remaining gravity and lateral resisting systems, as well as the stabilization bracing installed prior demolition, it is premature to assign remedial costs that will be required to bring the building up to code compliance.

We thank you for the opportunity to provide you with this assessment report and recommendations. Please contact me at 330-572-2184 or via email at celgin@gpdgroup.com with any questions or comments regarding this assessment.

Sincerely,
GPD Group

Christopher S. Elgin, PE
Project Manager

John N. Kabak, SE, PE
Director and Structural Department Head

Report Photos:

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<tr><td>Historical Photo of Original Construction – Looking North</td><td>Exterior – West Wall - Southwest Corner</td></tr>
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<tr><td>Exterior – West Wall - Southwest Corner – Note Second Floor Doorway</td><td>Exterior – West Wall - Northwest Corner</td></tr>
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<tr><td>Exterior – West Wall Masonry Deterioration</td><td>Exterior – West Wall Masonry Deterioration</td></tr>
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Basement – Temporary Shoring	Basement – Temporary Shoring
	
First Floor – Temporary Shoring	First Floor – Temporary Shoring
	
Second Floor – Temporary Shoring	Second Floor – Temporary Shoring and Floor-to-Wall Angle Bracket

	
Second Floor – Wall-to-Wall Angle Bracing – Southwest Corner	Second Floor – Wall-to-Wall Angle Bracing - Southwest Corner
	
Third Floor – Temporary Shoring and Floor-to-Wall Angle Bracket	Third Floor – Temporary Shoring and Floor-to-Wall Angle Bracket
	
Third Floor – Wall-to-Wall Angle Bracing – Southwest Corner	Third Floor – Wall-to-Wall Angle Bracing – Southwest Corner

	
Third Floor – Temporary Shoring, Wall-to-Wall Angle Bracing, and Floor-to-Wall Angle Bracket – Northwest Corner	Third Floor Ceiling – Joist-to-Wall Angle Bracket
	
Third Floor – Separation Between Third Floor Framing and South Façade	Third Floor – Separation Between Third Floor Framing and South Facade