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## MEMORANDUM

TO: Anthony Alvarez, Paul Davis Restoration and Remodeling

FROM: Brian Albrecht, PhD, PE (Lic. MN, ND, SD, WI)  
Matt Gundry, PE (Lic. MN, NH, WI)

DATE: June 21, 2024

RE: 509 North High Street Site Observations  
SEH No. PDRES P-179539 14.00

I hereby certify that the following sections of this memorandum were prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Wisconsin. Brian A Albrecht 39657, Sections 1, 2, 4, 5, 6.1, Attachment 1 and Attachment 2.

I hereby certify that the following sections of this memorandum were prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Wisconsin. Matt Gundry 36517, Sections 3, 6.2 and Attachment 3.

Engineers | Architects | Planners | Scientists

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This memorandum summarizes observations made during a site visit to the Romeis Millstream Apartments located at 509 North High Street in Chippewa Falls, Wisconsin. The site visit was requested to evaluate evidence of movement of the structure. Techniques used to make the assessment included visual observations of the condition of the structure and the surrounding area outside the structure, and hand tool (construction level, hand level, and tape measure) measurements of possible deflections. Recommendations are provided for potential future investigations to determine the source of the observed movements and track future movements of the structure over time.

## **1. SITE HISTORY**

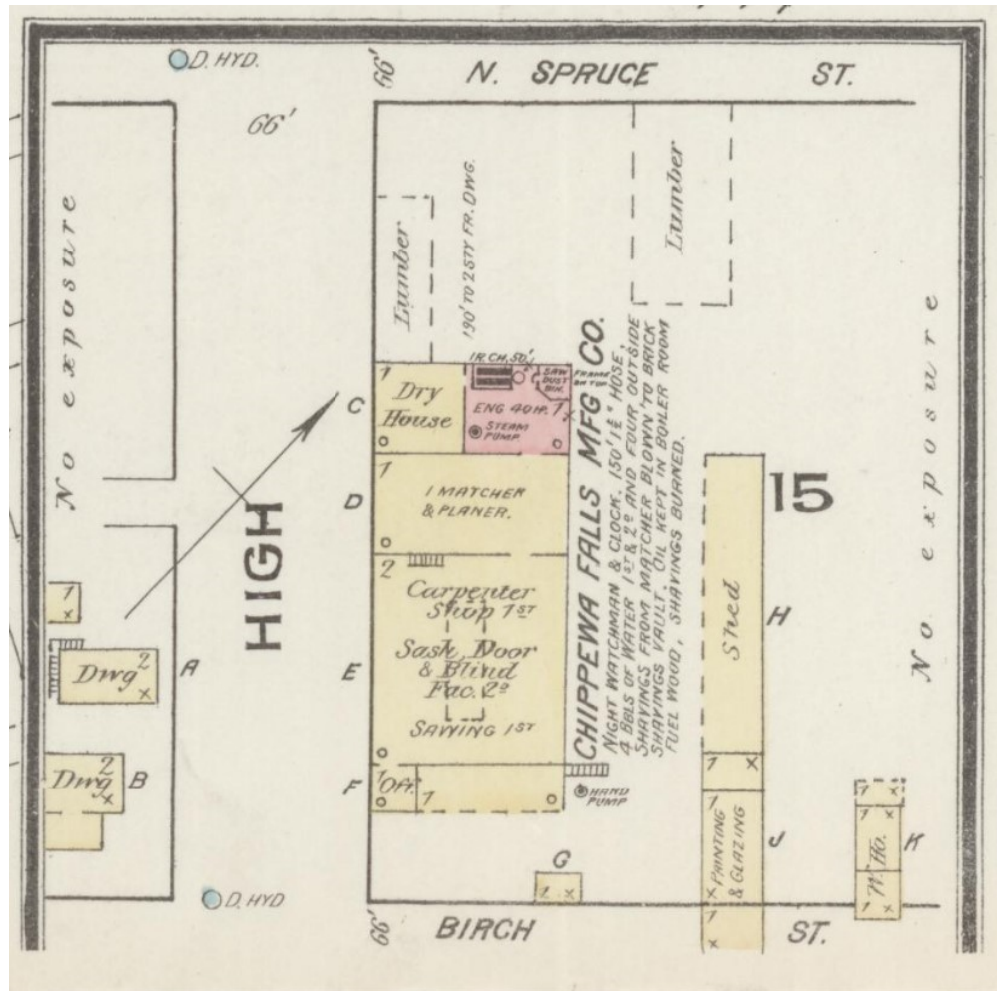
SEH performed a review of publicly available information to help determine the historic uses of the property where the structure is located. Publicly available data includes fire insurance maps of the area for the time frame between 1883 and 1910, and historic aerial imagery.

Historic fire insurance maps prepared by Sanborn Map and Publishing (Sanborn) are available for the area through the Library of Congress. The Library of Congress has digitized fire insurance maps for the years 1883, 1886, 1890, 1895, 1903 and 1910. Additional maps seem to exist for the years between 1924 and 1946, but they have not been digitized and are not readily accessible.

The Sanborn maps of the area use a grid system that appears to be roughly representative of city blocks. The Sanborn grid numbers will be referred to as "block" numbers in this memorandum. For the property at 509 North High Street, Block 11 was used. The property at 607 North High Street is on Block 15 in the fire insurance maps.

There is evidence of development in the area dating back to the 1883 map, with a manufacturing facility located on Block 15 and a lumber planing mill located south of Block 11. The 1883 map does not contain information about what may have existed on all of Block 11. The 1886 maps indicate the facility on Block 15 was a window and door manufacturing facility (Figure 1).

**Figure 1 – 1886 Sanborn Fire Insurance Map for Block 15 (607 N. High Street Site)**



By 1895 the window and door manufacturing facility appears to have expanded south into Block 11 with lumber storage and other facilities (Figures 2 and 3).

The window and door manufacturing facility appears to have been active on Block 11 and 15 past 1910, which is the date of the last readily available map (Figures 4 and 5).

Figure 2 – 1895 Sanborn Fire Insurance Map for Block 15 (607 N. High Street)

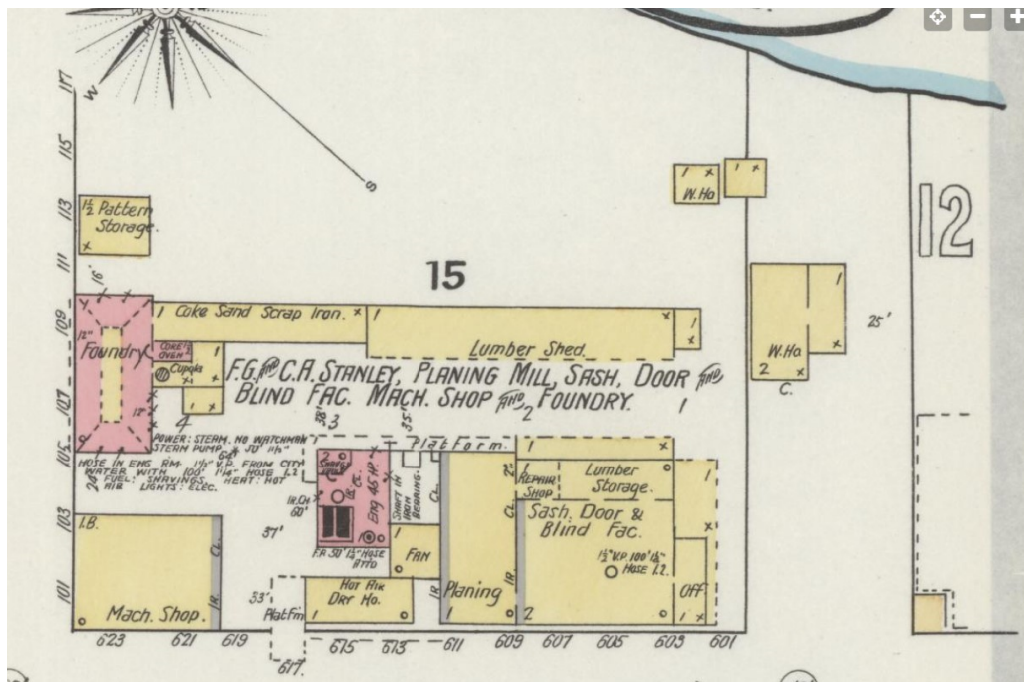


Figure 3 – 1895 Sanborn Fire Insurance Map for Block 11 (507 N. High Street)

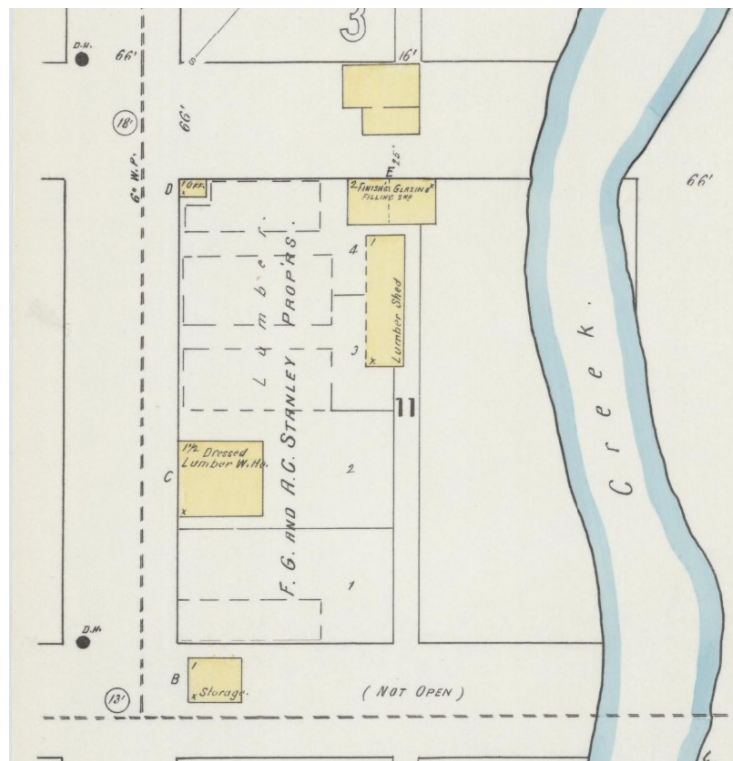




Figure 4 – 1910 Sanborn Fire Insurance Map for Block 15 (607 N. High Street)

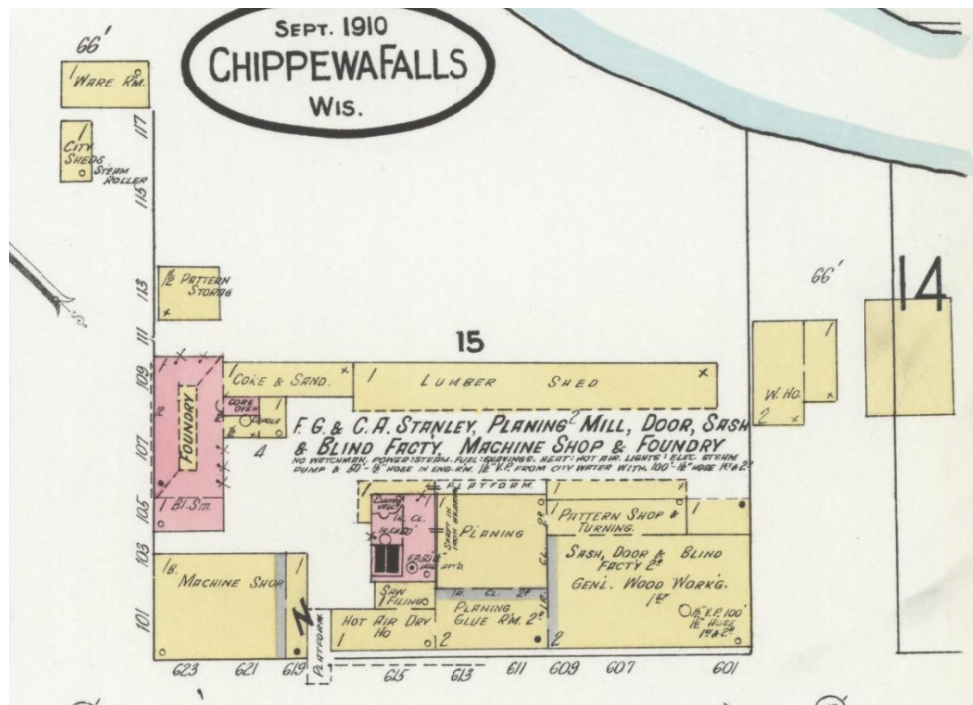
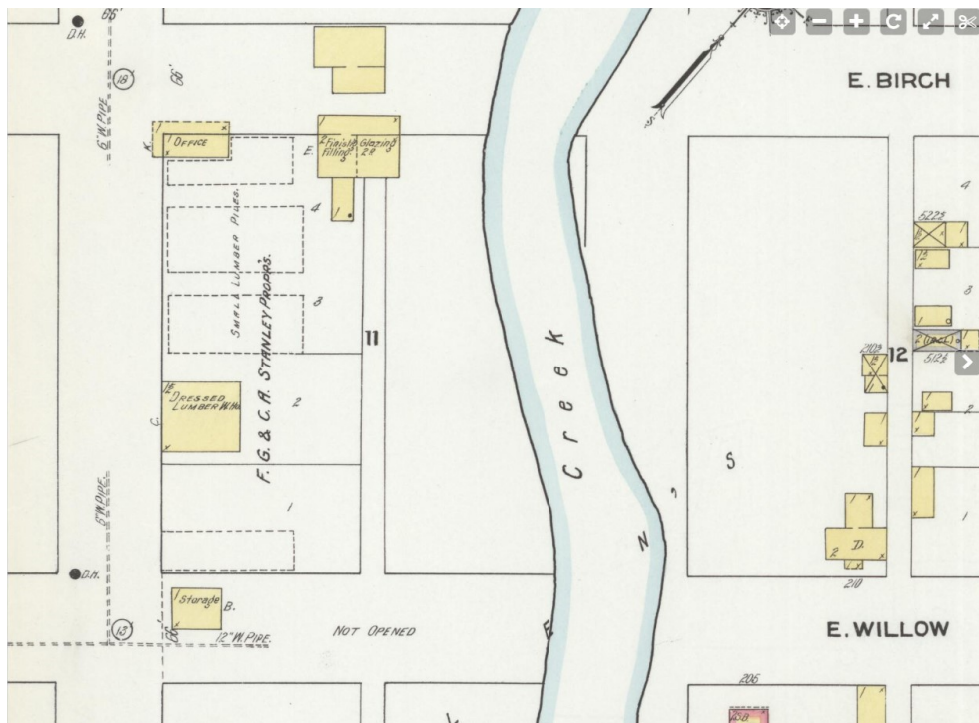


Figure 5 – 1910 Sanborn Fire Insurance Map for Block 11 (509 N. High Street)



Additional site information is available in historic aerial images available on the Chippewa County GIS database and from the Wisconsin Historical Society website. A 1938 image of the site from the Wisconsin Historical Society shows both Block 15 and 11 in what appears to be active industrial use (Figure 6).

Figure 6 – 1938 Site Aerial Image from Wisconsin Historical Society



The last available image for the site before the current structures were built is a 1968 image from the Chippewa County GIS map. By 1968 it appears many of the buildings on Block 15 had been torn down and replaced with different structures. The structures on Block 11 appear to have remained in place with little change compared to the 1938 image, with the area closest to Duncan Creek having been cleared of trees for what appears to be a storage or parking area.

Figure 7 – 1968 Site Aerial Image from Chippewa County GIS Map

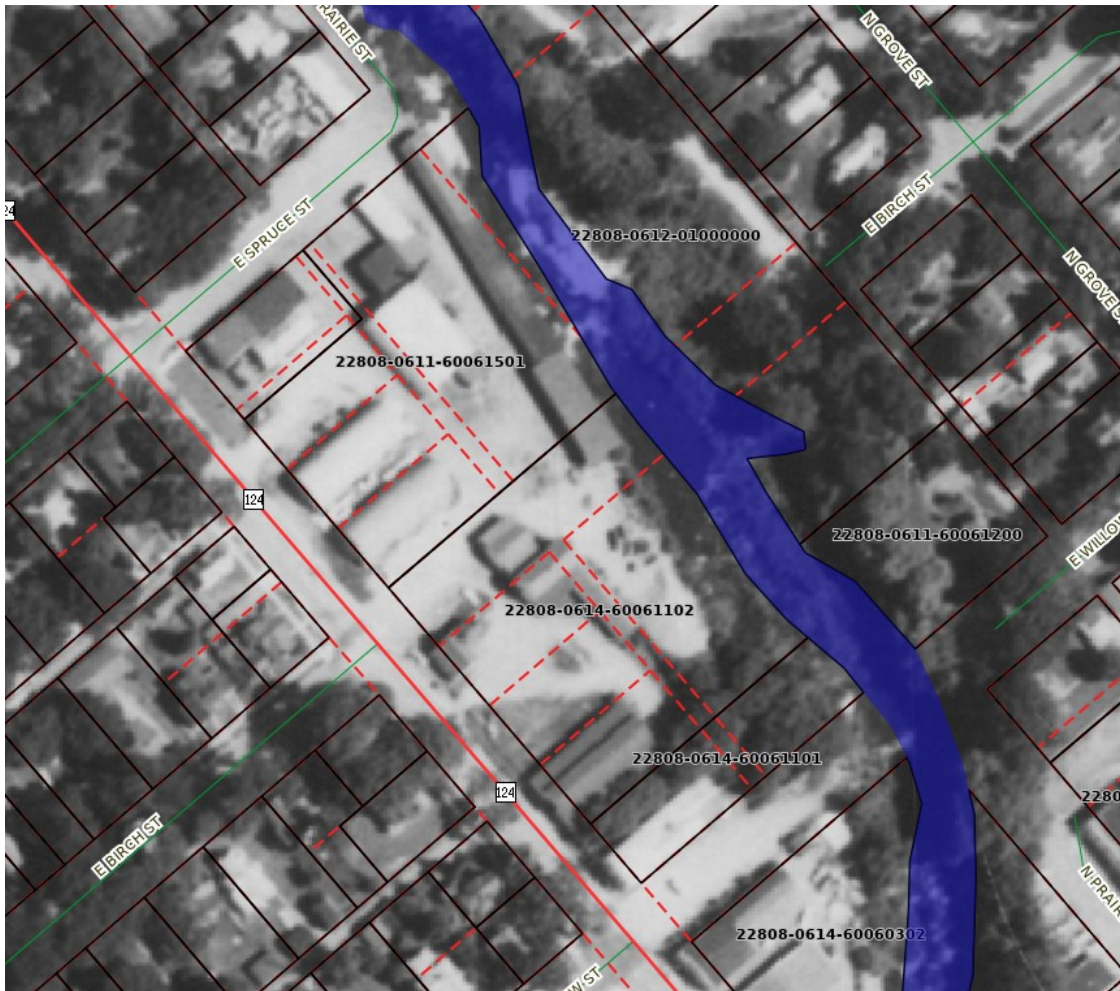
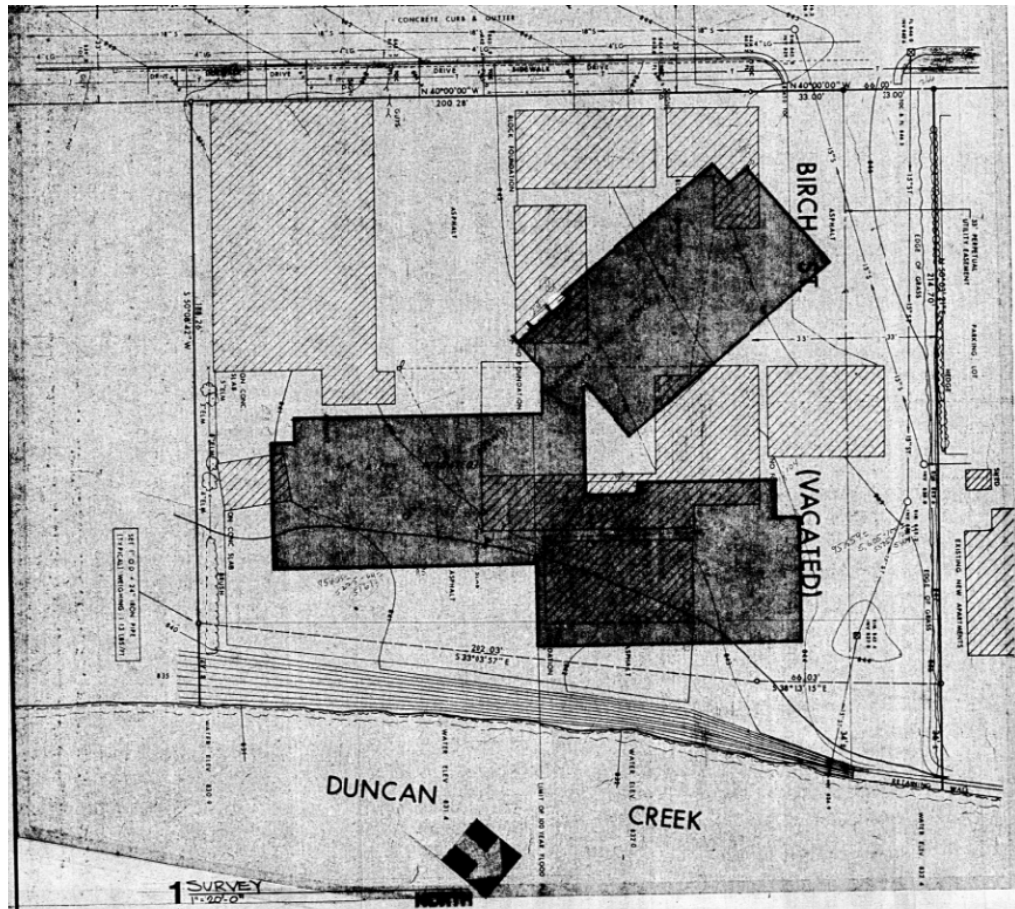




Figure 8 – Existing Building Drawings Site Plan



## 2. GEOTECHNICAL OBSERVATIONS

A visual inspection of the area on the east side of 509 North High Street was performed by a Geotechnical Engineer from SEH. The observed area included the ground surface between the structure and Duncan Creek.

The structure is offset from the crest of the creek bank about 30 feet at the northeast corner. Moving south along the same wall line, the crest of the slope reaches its closest point to the structure, 18 feet, where the wall line transitions from north-south to east-west. At the most obvious point of visual vertical movement on the structure, there is a roughly 21-foot offset to the slope crest.

The ground in the area between the structure and creek slopes gently to the east away from the structure and the site grade also drops north to south along the creek.

No visible evidence of lateral movement was observed on the ground surface between the structure and the creek. Visible evidence of movement can include cracking on the ground surface, or signs of a depression or drop in the ground surface running parallel to the creek, which would be the expected direction of movement if lateral ground displacement were to occur.

The grade from the crest of the bank of Duncan Creek to the creek appears to drop at a slope between 1H:1V and 1.5H:1V. The top of the creek bank appears to be between 10 and 15 feet above the water line. The surface of the slope is vegetated with a mix of large and small trees and some ground surface vegetation. Trees located on the slope were generally vertical and did not show signs of recent movement along the face of the slope. No toe cutting from erosion was observed along the toe of the slope. Vegetation made it difficult to fully observe the toe of the slope. However, debris consisting of concrete slabs and concrete rubble was observed on the slope face and along the toe of the slope. We also observed a chain link fence located at the crest of the creek bank which leans towards the creek. There was no visual evidence that recent movement of the slope face was causing the fence to lean. No visual signs of ground settlement could be seen along the edge of the building foundation and there appeared to be flat to positive grade away from the structure. A row of pavers separating the turf from landscaping gravel, which runs parallel to the structure, was generally straight and did not show signs of lateral ground movement towards the creek.

### 3. STRUCTURAL OBSERVATIONS

A site visit and visual observation was performed by a Structural Engineer from SEH on June 11, 2024. In part, the observations included comparison of current conditions to those documented in a Field Assessment Report completed by Ramaker & Associates on April 25, 2024. We were able to verify most, but not all, of the observations in the previous assessment. Notably, the masonry bearing wall and foundation wall size and composition was not visible. The original building plans that were provided indicated that the bearing walls were composed of 8-inch masonry block with 4-inch brick on 12-inch masonry foundations, founded on 10-inch-thick by 22-inch-wide strip footings. Wide flange headers over the windows were to be supported on 12-inch masonry piers. The previous assessment indicated the bearing walls and foundation walls were 8-inch total thickness and that the 12-inch masonry piers appeared not to be built. Neither condition could be verified without exploratory demolition as the wall interior was furred out and finished with drywall as shown in the plans. Differential settlement was noted between the lightly-loaded foundation segments located below the windows, and the more-greatly loaded foundation segments below the masonry bearing walls.

In addition to the roof observations in the prior assessment, we noted what appeared to be evidence of relative movement between the soffit and the brick exterior based on a stain line on the exterior. This may indicate a change in bearing condition for the roof trusses is occurring. Further examination of this condition was not possible at the time of the site visit.

We concur with the general conclusion of the Ramaker report that the affected wing of the building should remain unoccupied until structurally stabilized. We also echo concerns in the previous assessment that the foundations may be undersized, a situation that would be compounded if foundation soils do not meet the bearing demand.

The Ramaker report states that "this wing is not structurally sound." Based on additional field measurements of settlement by SEH included in this memorandum, this life safety statement should be expanded to the entire building, including the wing past the stair/elevator along the creek. Given the magnitude of the already occurred settlement, unknown root cause of the settlement, and unknown ongoing settlement rate; **the observed displacement and distress of the existing structure is an immediate and ongoing safety concern for occupants anywhere in the interior of the facility, and people and property in the surrounding exterior.** We recommend steps be taken to provide for the near-term stability of the structure (temporary shoring) or to relocate residents in affected areas until the structure has been stabilized.

#### **4. MEASUREMENTS**

A laser construction level was used to make measurements of the deviation from level along the east wall line of the structure, and within the community room.

For measurements made along the east wall line, a continuous line of mortar was followed down the length of the structure. Measurements were taken at 10 locations along the east wall line.

Measurements made in the community room were made to the top of the floor slab. Measurement points were spread about 15 feet along the west, middle and east sides of the room. A total of 15 measurements were made in the community room.

It is unclear how level the original construction of the building was, or if the points used as a reference have moved since construction. As a result, the recoded measurements cannot be used as an absolute measure of the magnitude of movement since the structure was constructed.

Figures showing the measured offset from the highest location along either the wall line or floor slab are included in Attachment 1.

The highest point along the wall line is just south the entry door that sits on the east-west wall. From there, the mortar line dips a maximum distance of 3.9 inches at the southeast corner of the structure. There is visible cracking on the brick facing at that corner of the structure. An offset from level of 3.9 inches was also measured near the midpoint of the north-south wall line on the northern half of the structure. The brick facing at this location is visibly lower than adjacent brick facing, but no visible cracking is readily apparent on the exterior of that portion of the building.

In the community room, the highest portion of the floor slab is in the northwest corner. The floor slab slopes to the southeast, reaching a maximum deviation of approximately 5.6 inches, referenced to the highest portion of the floor slab. At the location of the maximum deviation, it is apparent the interior wall has previously cracked and been repaired, and there is a significant difference in the width of the trim strip above the adjacent window.

#### **5. SUMMARY**

The structure at 509 North High Street sits on a site with historic use in the wood products manufacturing industry dating back to the late 19 century. A site grading plan dating to the structure's construction (see Figure 8) appears to indicate that portions of the footprint of 509 North High Street sit over the footprint of previous structures at the site. It is unclear what foundations existed on the site from the previous structures, and how or if those were fully removed during construction. It is also unclear if any portion of the site was previously filled (reclaimed land), or if debris was buried on the site while it was being used for industrial purposes. If debris did exist on the site at the time of construction, it is unclear if it was removed, and if it was removed, how those excavations were backfilled.

A site grading plan from the time of construction that was provided to SEH indicates some filling of the site was required to establish the current grade of the site during construction. The maximum fill thickness was placed under the southern portion of the structure. A maximum fill thickness of between 5 and 6 feet was required to reach the interior slab elevation of 846 feet. The required fill thickness appears to have tapered off to roughly 2 feet under the northern portion of the structure.

It is unclear what the material and compaction requirements were for that fill.



Based on our observations made during the site visit, there is no visible evidence of lateral ground movement (a slope failure moving towards Duncan Creek) extending back to the building. In addition, distress is noted in various parts of the structure instead of an isolated spot, or on one wall line. The movement at the southeast corner of the structure is occurring a distance away from Duncan Creek, and in a direction (dipping to the south) that make slope movement an unlikely source for that distress. Based on the visible repairs that have been made at various spots around the structure, it appears the movement has likely been ongoing and is not a result of a sudden shift in the ground.

Therefore, it is our opinion that the distress observed in the structure is not a result of lateral ground movement under the structure.

It is our opinion that the observed damage to the building is likely due to vertical subsidence rather than lateral movement. Possible causes of vertical movement include settlement of the soil under the structure from either loose/soft native soil, poorly compacted fill soils that may have existed prior to construction or were placed during construction, decaying debris, or a purely structural failure of the foundation.

Other possible sources of vertical movement include the loss of soil into broken utility lines. However, given the widespread nature of the observed movement, we feel that this is an unlikely scenario.

## **6. RECOMMENDATIONS**

Based on the available information, and the observed site conditions, SEH recommends the following items to better evaluate the cause of the observed movement.

### **6.1. Geotechnical Recommendations**

- Perform four geotechnical borings along the east side of the structure to check for the presence of possible debris, fill materials or poor soil conditions that could be contributing to the observed movements. One boring should be performed near the southeast corner of the structure, and one boring should be performed near the middle of the wall like on the northern half of the structure where there is obvious visual evidence the structure has moved. One boring should be performed near the high point on the east wall line and the fourth boring should be performed at the northeast corner of the structure.
- Perform two additional borings along the back (road-side) of the wings facing the creek as comparison to the
- We estimate the borings will reach bedrock at a depth of 20 feet. We recommend coring a minimum of 10 feet of bedrock at two of the boring locations in case micropiles become a preferred foundation repair option.
- Establish settlement monitoring points on the structure's exterior and interior (if accessible) and begin monitoring for the building's movement. This will allow for the rate of any measurable movement to be established.
- Based on the soil conditions established by the proposed geotechnical borings, calculate the allowable bearing capacity for soils under the east wall line, and assess the settlement potential for existing site soils.

### **6.2. Structural Recommendations**

- Given the inability to currently directly observe the condition of the load carrying elements of the walls and connections between the floor planks and load carrying elements, we recommend further observations.

- Remove a portion of the interior sheet rock in the community room and at roof truss bearing in the area of the most observed movement so the condition and configuration of the interior masonry units can be observed.
- Verify the truss bearing condition either by removal of soffit panels from a lift or by partial demolition and removal of insulation from the attic.
- Perform a load analysis of the structure to estimate the foundation pressures.
- Expose a limited portion of the foundation (i.e. "pothole") on the structure's exterior around the most observed movements to the bottom of the perimeter footing to observe the exterior foundation wall's condition and partially verify the footing width. We recommend this be done in the largest observed movement along the northern portion of the structure, and at the southeast corner of the structure. Plans for the structure indicate the top of footing is 4 feet below grade. Given the limited depth of this excavation, and the desire to cause as little disturbance to the structure as possible, we recommend this excavation be made by hand or with a vacuum truck. Extreme care shall be taken during this effort; and it should be performed only under direct supervision of a structural engineer.
- If indicated by results of investigation above, solicit repair estimates from foundation repair specialists, and other associated repairs to the superstructure.
- Shoring for both temporary stabilization and facilitation of permanent stabilization of the building is required. Viability of the temporary shoring requires load analysis. However, based on measured settlements in the community room of the slab that exceed the settlement in the walls, it is unlikely that conventional shoring on ground will be effective since the slab is moving faster than the walls and shoring may exacerbate this. Attachment 3 contains preliminary concepts of temporary shoring options; these cannot be finalized until discussions with foundation repair specialists and load analysis of the structure.

dmk

Attachment 1 – Measurements of Deflections from Horizontal

Attachment 2 – Select Photographs

Attachment 3 – Building Section

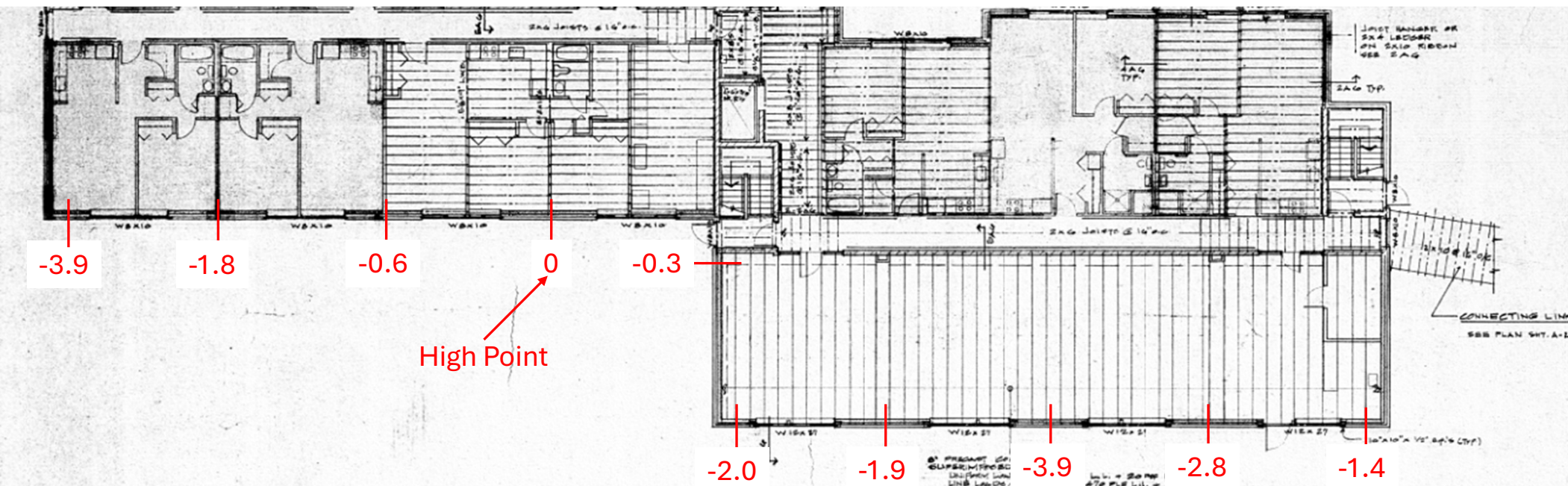
c: Ariel Christenson, Darin Hyatt

[https://sehincazure-my.sharepoint.com/personal/balbrecht\\_sehinc\\_com/documents/paul davis 509 n high street/509 n high street memo\\_v2.docx](https://sehincazure-my.sharepoint.com/personal/balbrecht_sehinc_com/documents/paul%20davis%20509%20n%20high%20street/509%20n%20high%20street%20memo_v2.docx)

## Attachment 1

### Measurements of Deflection From Horizontal

## Deviation From High Point of Measurement, June 11, 2024



Base Image From Hackner Schroeder Roslansky & Associates Inc. Plan Set Dated April 1978

Architectural floor plan of a building slab showing elevation points and structural details. The plan includes a grid of vertical lines and horizontal lines. Elevation points are marked with red dots and labeled with values: -3.0, -1.3, -0.3, 0, -0.3, -3.3, -3.0, -1.8, -0.8, -3.3, -5.6, -4.4, -3.0, -2.4. A red arrow points to the highest point, labeled 'High Point'. A red arrow points to a '2 Inch Drop Across Hall Into Community Room'. A red arrow points to a 'Level Across Hall Into Community Room'. The plan also shows structural details like walls, doors, and windows. Text at the bottom reads: '8" PRECAST CONG. SLAB SUPERIMPOSED LOADS: UNIFORM LOADS = 40 PSF L.L. + 20 PSF D.L. LINE LOADS @ BR. WALLS: 470 PLF L.L. + 570 PLF D.L.'.

Base Image From Hackner Schroeder Roslansky & Associates Inc. Plan Set Dated April 1978

## Attachment 2

### Select Photographs





Existing Slope of Duncan Creek – Facing South



Area Adjacent to the Northern Portion of the East Wal Line – Facing South







Paver Line Along Northern Portion of East Wall Line - Facing South



Area Adjacent to the Southern Portion of the East Wal Line – Facing South



East-West Wall Line Near Midpoint of Structure – Facing West





Exterior Cracking at the Northeast Corner of the Structure – Facing South



Exterior Cracking at the Southeast Corner of the Structure – Facing South





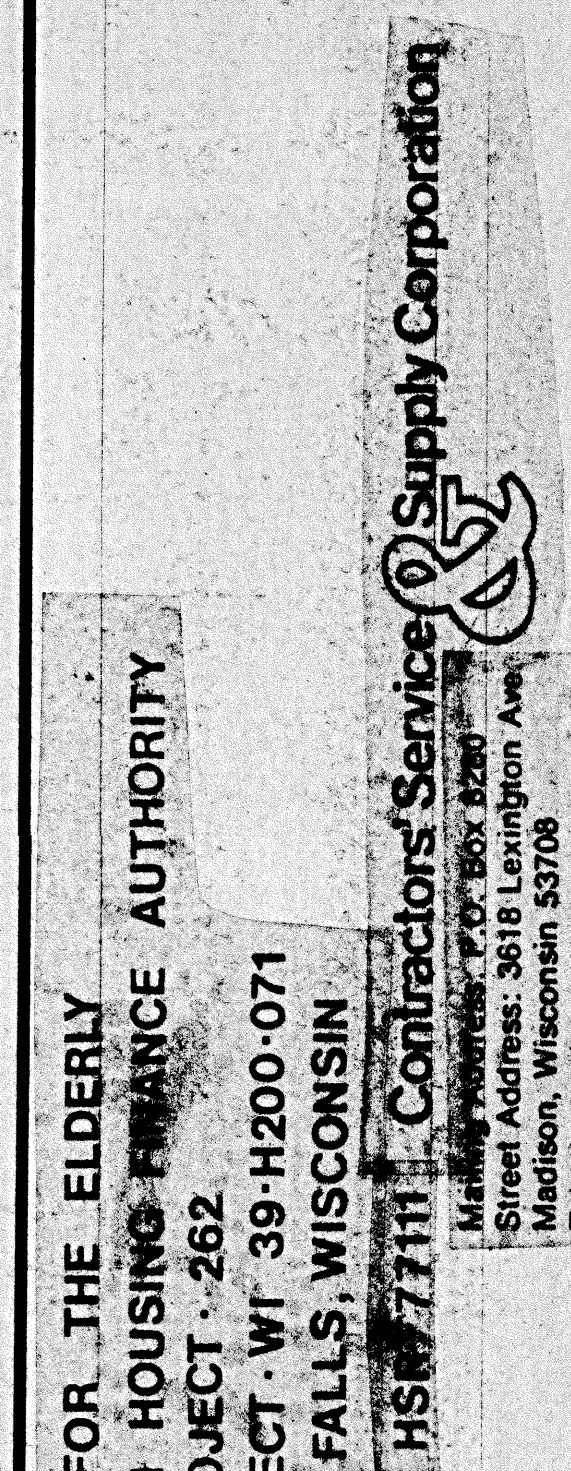
Out of Plumb Door Jamb, Entry Door Along East-West Wall Line – Facing North



Community Room East Wall – Facing East

Attachment 3  
Building Section





**HACKNER SCHROEDER ROSLANSKY & ASSOCIATES INC.**  
**Architects/Engineers/Planners**

**La Crosse, Wisconsin**

# A12

I HEREBY CERTIFY THAT THIS PLAN,  
SPECIFICATION, OR REPORT WAS PRE-  
PARED BY ME OR UNDER MY DIRECT  
SUPERVISION AND THAT I AM A DULY  
'REGISTERED ARCHITECT  
UNDER THE LAWS OF THE STATE OF  
VIRGINIA

*James E. Kuyper*

DATE 4-78 REG NO A-02170