

## Investigation Report

Carnaghi Structural Consulting Project No: 21056

Report Date: October 19, 2021

Property Name: 1021 Harding Ave.  
Property Address: 1021 Harding Ave.  
Rochester Hills, MI 48307

Client: Ms. Nancy Filipek  
311 Wesley St.  
Rochester, MI 48307

Client Reference: 1021 Harding Ave.

Report Authored By:



Stephen R. Ternullo, PE  
Senior Structural Engineer  
PE Expires: April 14, 2023



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## Scope of Work

The project was received by Carnaghi Structural Consulting, LLC (CSC) on October 15, 2021 from Ms. Nancy Filipek.

The scope of work was defined as:

- Evaluate the referenced structure to determine the feasibility of repairing

The scope of work did not include:

- Determining costs of repairs
- Development of plans addressing repairs

In response to the client's request, Stephen R. Ternullo, P.E. (CSC) visited the referenced property. Ms. Filipek, and others were present and provided access to the property and historical information.

An engineering examination of the subject structure at the referenced location was conducted. Findings, analysis and opinions are included herein this report. This report contains a discussion of the data gathered during the examination and analysis, and opinion with respect to the condition of the subject structure at the time of the examination. The opinions contained herein are based on information that was made available as of the date of this report.

## Procedure

The collection and analysis of data for this project followed an application of engineering principles. The principles included performing observations and collecting of data to develop rational opinions.

The procedures followed included:

- A site examination was conducted on October 18, 2021.
- The following documents were reviewed:
  - Historic House Fire Report prepared by Lopez Engineering, Inc. dated January 13, 2019
  - Preliminary Report published by Rochester Hills Historic Districts Study Committee dated February 2021
- The following was researched:
  - Municipal records available online
  - 2015 Michigan Residence Code
- This Structural Investigation Report was authored at the client's request.

## Historical Information

Data available online from the Rochester Hills assessing and building department indicated the subject structure was originally constructed in 1860 and contained approximately 1800 square feet.

The following general information was obtained during the site examination and through conversations with the client and others:

- The subject structure was considered a Historical Structure.
- A fire occurred at the structure in 2016 or 2017 and no repairs had been made.
- The temporary roof covering was not maintained allowing precipitation to enter the structure for a prolonged period of time.
- The client is considering purchasing the property.

## Structure Description

The structure was a two story, single-family dwelling constructed of light wood framing supported on brick masonry walls with sloped roof planes supported on crawl space and Michigan basement type foundations. The roof was covered with asphalt shingles and non-maintained temporary poly tarps. The exterior walls were constructed of brick and wood trim. For the purpose of this report, the front entrance of the dwelling is considered to face north towards Harding Avenue.

## Notable Observations

Examination was limited to visual and accessible portions of the subject structure. Removal of finish materials or debris, qualitative testing, excavation, destructive testing, or other work not specifically described herein was not conducted.

Notable observations were photographed to document relevant conditions of the subject structure on the date of the site examination. All damage or distress present may not have been observed or photographed. The photographs included herein provide an indication of the types, severity, and distribution of the damage or distress observed. Additional photographs not included herein may be available if deemed required.

During the site examination of the structure, the following notable observations were made:

### Exterior Observations

- The framing above the front porch at the north side of the structure was severely fire damaged.
- Portions of the collapsed roof was noticeable.
- The framing covering a porch on the east side of the structure was severely deteriorated.
- Framing for a deck above a one-story portion of the structure accessed via a second story door on the south side of the structure did not appear to be complete or compliant with applicable building codes.
- The brick chimney on the west side of the structure was severely deteriorated and displaced away from the main the structure.

### Interior Basement Observations

- The basement walls consisted of mortared stone and appeared to be in serviceable condition.
- An area of first floor framing was burned through and damaged one or more floor joists.
- Adjustable shores were in place as part of previous attempts at addressing first floor framing distresses.
- First-floor framing was constructed of rough sawn lumber.

### Interior Crawl Space Observations

- The crawl space floor consisted of wet dirt without a vapor retarder.
- Numerous miscellaneous supports were placed to address first floor framing distresses.
- First-floor framing was constructed of rough sawn lumber.

### Interior First Floor Observations

- Household items were scattered about which limited access to the first-floor area.
- Areas of attic insulation had fallen to the first floor.
- The first-floor area was wet and containers scattered about to catch dripping water.

- The floor framing was soft under foot.
- The exposed flooring in the front north room was delaminated.
- Fire damage to cosmetic items such as moldings and window frames was severe throughout the north half of the structure.
- Brick masonry of an interior structural support wall was failing at an archway between two rooms near the front of the structure.
- Exterior brick with no vertical wall studs was visible where wall finishes were displaced.
- The stair to access the second floor did not appear to have code compliant head clearance at the bottom of the stair.
- Multiple wall interior wall studs were damaged by fire.
- Second-floor framing was constructed of rough sawn lumber.

### **Interior Second Floor Observations**

- Most of the second-floor ceilings were displaced down to the floor exposing the attic and roof framing.
- Debris and household items were scattered about the second-floor area.
- Large sections of the roof were missing and temporary poly tarps that were put in place to protect the structure from weather were no longer providing protection.
- The second-floor area was area wet.
- The floor framing was soft under foot.
- A brick masonry structural supporting wall near the southeast of the second floor was failed and collapsed.

### **Roof Framing Observations**

- The roof framing consisted of rafter framing with ceiling joists.
- Large sections of the roof framing were missing or collapsed to the second floor, allowing precipitation to entire the structure.
- The roof rafters and sheathing that remained in place was charred.
- Roof and ceiling framing were constructed of rough sawn lumber.

## **Review of Documents**

### **Research**

#### **Lopez Engineering, Inc. Historic House Fire Report**

Following is a list of notable information contained in the report:

- The report was dated January 31, 2019 and signed by Mr. Thomas Mickus, PE.
- The purpose of the report was to investigate the structural integrity of the entire structure.
- The inspection of the interior was described as being difficult without adequate lighting and hindered by the amount of debris and household items.
- Fire had damaged the wood infrastructure with the roof as being the main area of damage.
- The ends of roof rafters were described as being embedded into the brick masonry walls.
- It was noted that there was little damage to the exterior brick.
- There was no discussion regarding the first floor framing as viewed from the basement and crawl space levels.
- There was no discussion regarding the extent or time of active water intrusions into the structure from non-maintained temporary poly tarps on the roofs.
- The roof lines were described as sagging at many points.

### **Preliminary Report from Rochester Hills Historic District Study Committee**

Following is a list of notable information contained in the report:

- The report was dated February 2021 as a Draft Report and not signed by any particular author but listed several Study Committee Members.
- The report established that the structure was considered as contributing to the Historical District.
- The house suffered an extensive fire in November 2017.
- The chimney on the west side of the house was non-original.
- The doors and windows were boarded up.
- Photographs provided in the report indicate they were captured in January 2021.
- Only one photograph of the interior was included in the report and it was captioned to have been captured from the exterior.

### **Codes & Standards**

Research was conducted utilizing the 2015 edition of the Michigan Residential Code. Appendix J of the 2015 Michigan Residential Code is the section that addresses Existing Buildings and Structures. Other building codes may also be applicable for addressing the subject structure.

Section AJ501.3 defines an Extensive Alteration as: Where the total area of all of the work areas included in an *alteration* exceeds 50 percent of the area of the *dwelling unit*, the work shall be considered to be a reconstruction and shall comply with the requirements of these provisions for reconstruction work.

Appendix J prescribes that the Building Official shall be consulted to determine the specific applicability of the Codes' provisions.

*The Building Official may require that reconstruction be compliant with the 2015 Michigan Building Code.*

Section AJ501.4 prescribes that the minimum design loads for the structure shall be the loads applicable at the time the building was constructed, provided that a dangerous condition is not created. Structural elements that are uncovered during the course of the *alteration* and that are found to be unsound or dangerous shall be made to comply with the applicable requirements of this code.

*As all of the structural framing will be uncovered during any rehabilitation and there was no building code applicable at the time of construction, the structure may be required to be compliant with the structural prescriptions of the 2015 Michigan Building Code.*

In addition to structural concerns, the building code prescribes the requirements related to electrical, plumbing, heating and ventilation, insulation, fire protection, clearances and room sizes, stairways, means of egress, insulation requirements, and all other aspects of a residential structure.

### **Analysis of Data**

Previous investigations were not thorough and did not include consideration of long-term exposure to water intrusions. This investigation should not be considered thorough enough to identify all concerns related to the rehabilitation of the structure.

The Lopez Engineering investigation occurred more than two years prior to this investigation and although the structure was concluded by Mr. Thomas Mickus, PE to be salvageable, the conditions noted were the conditions in January 2019. The Lopez Engineering report also provided a list of recommendations of how

to begin the rehabilitation which included engaging a Licensed Professional to develop renovation drawings.

The floor framing at both first and second floors were soft under foot and if intended to remain, will require structural analysis to determine the weight carrying capacity. It is probable that with the amount of previous added supports, the deflections of the floor under foot, the exposure to water, and the lack of a building code during original construction; the floor framing will be determined not to be adequate and require replacement beyond the areas that were noted damaged.

Wood that was not intended to be in a wet environment will decay when repeatedly exposed to water over several years. It should be expected that much of the first and second floor framing was damaged as a result of being exposed to water for several years. Long term exposure to water in a structure will cause mold growth.

The brick exterior of the structure was the load bearing element of the structure. Removal and replacement of roof rafters and floor joists that were embedded into the exterior masonry during the original structure will cause the brick veneer to fracture. The original structural framing was constructed of rough sawn lumber. Typical replacement roof rafters and floor joists would not be of the same size, shape and species as the original creating the need for modifications to the brick.

There were several areas where the structural load bearing brick was damaged and required replacement or repairs.

Fire damaged many of the windows and their frames and interior moldings. Long term decay and fire damaged much of the framing over the north and east porches.

If the structure is to be rehabilitated, previous non code compliant renovations will be required to be made code compliant.

## **Additional Work and Information Requested**

No additional work by CSC is recommended at this time.

## **Opinions**

The analysis of available data as of the date of this report, related to this project supports the following opinions:

1. The structure was severely damaged by fire.
2. The structure was not properly protected from the environment or maintained.
3. The structure probably has experienced decay from long term water exposure.
4. The exterior brick is the only load bearing structural element in the exterior walls. There were no vertical wall studs in the exterior walls.
5. Required repairs to the structure framing will damage the exterior brick.
6. The rehabilitation of the structure to maintain the historical characteristic of the exterior brick is not feasible.

## **Appendices**

- Appendix A – Photographs

## Limitations

The information presented in this report addresses the limited objectives as defined in the Scope of Work section of this report related to the subject structure. The opinions presented in this report were made to a reasonable degree of scientific and engineering certainty based upon the data available at the time this report was authored. This report describes the conditions observed and present at the time of CSC's examination. This report is not intended to fully describe or document every defect or deficiency throughout the subject structure or property.

The opinions contained within this report are limited to the circumstances associated with this project, and are based on the author's education, experience, and training. Should additional information which relates to the analysis of data become known, CSC reserves the right to alter the opinions contained in this report as appropriate.

This report was furnished as privileged and confidentially to the client. Release to any other company, concern, or individual is solely the responsibility of the client. Any verbal statements made before, during, or after the course of the project were made as a courtesy and are not considered a part of this report. Any reuse of this report or the opinions or recommendations presented herein without the express written consent of CSC is prohibited.

This report and its appendices are not to be considered a guarantee of condition and no warranty is implied. Portions of the structure not discussed or documented in the report is not intended to be considered as being without deficiencies.

## Professional Engineer Seal and Signature

For convenience, this report was transmitted electronically. The seal and signature on the front page of this report is for demonstrative purposes. If requested, a hard copy of the report with a "wet seal and signature" can be provided.

It is a violation of law for any person to alter this document in any way, unless acting under the direction of the Licensed Professional Engineer that sealed and signed the document.

Property Name: 1021 Harding Ave.  
CSC Project NO: 21056

Appendix A – Photographs



Front of subject structure looking south.





Front porch on north side of structure. Note portion of roof missing behind dormer.



Alternate view of front porch at northeast corner.



East side of subject structure looking southwest.



Arrow points to deteriorated roof framing over porch at east entry.



Alternate photograph of east side of structure looking northwest. Note missing roof area.



Rear, south side of structure looking north. Note unconventional framing over one-story portion.



West side of structure looking northeast. Note chimney displaced away from structure.



Alternate view of chimney displaced away from structure.



Portion of first floor framing with fire damage.



View into crawl space.



Interior structural brick wall damaged at opening on first floor.



Exterior brick wall. Note that there were no wall studs against the brick.



Another example where there were no interior wall studs against the exterior brick.



Delaminated flooring at first floor. Note buckets to collect water.



Access stair to second floor with limited head room.



Roof and ceiling framing over second floor.

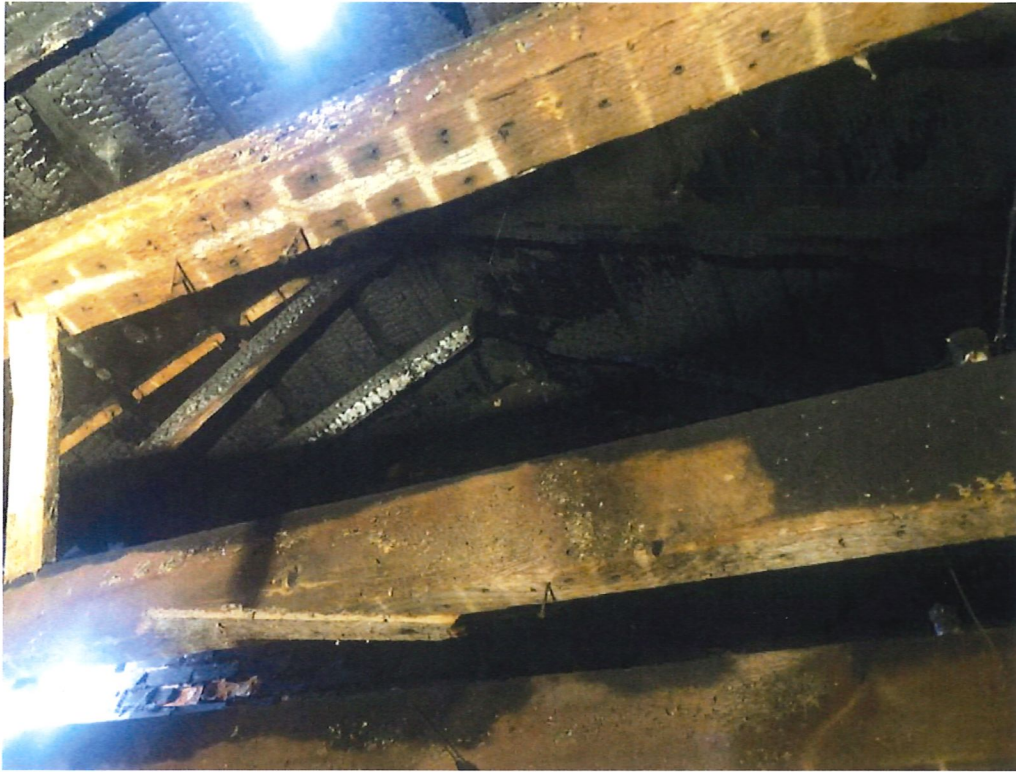




Roof and ceiling framing missing over portion of second floor.



Failed load bearing brick wall at second floor.



Alternate photograph of roof and ceiling framing over second floor.



Alternate photograph of roof and ceiling framing over second floor.