

# 4140 – 4146 Fremont Avenue North Minneapolis, MN

## Structural Condition Assessment



Prepared By



100 PORTLAND AVENUE SOUTH, SUITE 100

MINNEAPOLIS, MINNESOTA 55401

PHONE: 612.332.3654 FAX: 612.332.3626

Project Number 16010.00

February 6, 2016

February 6, 2016

Abdulkadir Jama  
City of Minneapolis  
Community Planning and Economic Development  
105 Fifth Avenue South  
Suite 200  
Minneapolis, MN 55401-2534

Re: 4140 – 4146 Fremont Avenue North - Structural Condition Assessment  
CDG Project 16010.00

Dear Mr. Jama,

We have completed the Structural Assessment for this project as proposed. This report summarizes our evaluation procedures along with our observations, conclusions regarding probable causes of the structural deterioration, and recommendations for repairs.

The services performed in evaluating the identified portions of the building structure and in preparing this report have been in accordance with the level of skill and care normally used for this type of project. The conclusions and recommendations discussed in this report are our best professional opinions based on our knowledge of current design and repair of this type of building. No warranties are expressed or implied.

It has been a pleasure to perform this service for you. If you have any questions, or if we can be of further assistance, please feel free to call.

Very truly yours,

**Collaborative Design Group, Inc.**



Craig Milkert, PE  
Principal

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Engineer under the laws of the State of Minnesota.



Craig Milkert, PE

Date 2/6/2016  
License #18360

**TABLE OF CONTENTS**

EXECUTIVE SUMMARY ..... 1

INTRODUCTION ..... 2

SCOPE OF REPORT ..... 2

    Review of Documents ..... 2

    Observations..... 2

DISCUSSION ..... 25

RECOMMENDATIONS ..... 26

    4140 Fremont ..... 26

    4142 Fremont ..... 26

    4146 Fremont ..... 27

    Estimated Costs..... 27

## EXECUTIVE SUMMARY

The purpose of this study is to report on the overall structural condition of the property, and specifically the structural issues identified in the Property Condition Report prepared by Terracon, dated October 23, 2015. This report addresses the visible components of the structures at 4140 – 4146 Fremont Avenue North. The property was originally constructed as two separate buildings; a one story building at 4140 and 4142 Fremont, and a two story building at 4146 Fremont. The age of the buildings is unknown, but estimated to be at least 70 years old.

The wood frame structure that is visible in the basement is in overall good condition, with some isolated components in poor condition due to deterioration. Other than a few openings in the walls and ceilings, the upper levels of the property are completely finished, making observations of the wall and roof framing not feasible. No determination of the structural condition of the upper levels or roof has been made other than what is specifically discussed in this report.

The foundations of these structures appear to be in overall good condition and performing well. The deterioration of the wood framing identified in the observations below is all due to excessive moisture or water infiltration. Significant biological growth discovered in 4140 and 4142 Fremont on the underside of the first level floor structure on the east side of the basement is an indication that there is excessive moisture in the wood framing members. The deterioration of the wood floor sheathing, joists, and beams is also the result of water infiltration along the east side of the building. This water infiltration must be corrected prior to the repair or replacement of the deficient wood framing identified above. Although the investigation and recommendations for the correction of the water infiltration is outside of the scope of this report, it is typically the result of poor site drainage.

The apparent sagging floor on the first level of 4140 Fremont is not caused by settling foundations, but rather from the deterioration of the base of the wood column. The columns are deteriorating due to moisture being wicked up from the damp concrete floor and foundations.

The concrete slab on grade is cracked and has evidence of minor heaving in all of the basements of this property. None of the conditions noted are considered a structural deficiency, but can be corrected if the basements are to be used as occupied spaces.

## INTRODUCTION

The property at 4140 – 4146 Fremont Avenue North in Minneapolis, MN was actually constructed as two separate buildings. 4140 and 4142 Fremont Avenue North is a one story building with a basement that is divided into two spaces, while 4146 Fremont Avenue North is a separate two story building with a basement.

The purpose of this study is to report on the overall structural condition of the property, and specifically the structural issues identified in the Property Condition Report prepared by Terracon, dated October 23, 2015.

## SCOPE OF REPORT

### Review of Documents

We have reviewed the Property Condition Report prepared by Terracon dated October 23, 2015. The Terracon report is comprehensive of all building issues and indicates that there may be some structural issues that require further investigation. The report identifies the following issues that require further structural evaluation:

- Beam/column shift at rear of basement of the 4140 building.
- Integrity of the floor joists with observed mildew along the rear of the building.
- Confirmation of basement slab integrity at observed (scattered) cracks/bulges in basement slab.

### Observations

A site visit was performed in January 2016 to observe the structural condition of the buildings. Only the visible portions of the structure were observed. The following rating system was used in assessing the condition of the building components:

- **Exceptional:** The building component is new, with no apparent defects.
- **Good:** The building component is able to perform its originally intended function in its current condition. Any defects are minor and do not affect the performance of the building component.
- **Poor:** The building component is unable to perform its originally intended function in its current condition. The component has major defects, but is repairable.
- **Unacceptable:** The building component is unable to perform its originally intended function in its current condition, and cannot be economically repaired. Replacement of the building component is required.

For the clarity of our discussion, the observations are separated into the three addresses of 4140, 4142, and 4146 Fremont. Visual observations of the building are recorded below.

| OBSERVATIONS   | REFERENCE PHOTO  |
|--|--|
| <p><b>4140 Fremont Ave.</b></p> <ol style="list-style-type: none"><li>1. The building is a one story retail building with the west side fronting on Fremont Avenue. 4140 is the south portion of this building.</li><li>2. The south side of this building is constructed with brick masonry, and appears to be in overall good structural condition, with some areas of minor cracking and deterioration.</li></ol> |   |

**OBSERVATIONS**

**REFERENCE PHOTO**

- 3. Some deterioration of the brick masonry is evident, likely due to water infiltration.



- 4. The east side of the building is constructed with painted brick masonry. Some deterioration of the brick masonry is evident, likely due to moisture being trapped in the masonry by the paint.



| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| 5. Some cracking of the brick masonry is evident.   |   |
| 6. A crawlspace is located under the west half of the first floor. The floor is framed with wood joists, supported by masonry walls. The framing was mostly inaccessible for inspection, but appears to be in overall good condition. |  |

| OBSERVATIONS  | REFERENCE PHOTO   |
|---|---|
| <p>7. A basement is located under the east half of the first floor. The floor is framed with wood plank sheathing supported by wood joists, beams, and columns. All framing appears to be in overall good condition, with some localized deterioration.</p> |  A photograph of a basement interior. The ceiling consists of dark wood joists and beams. A large, light-colored concrete pipe runs horizontally across the upper right. The walls are white and appear somewhat aged. The floor is a smooth, light-colored concrete. A vertical wooden post supports the ceiling structure. |
| <p>8. Heavy biological growth is evident on the floor framing on the east side of the basement.</p>   |  A close-up photograph of the basement's structural elements. It shows a network of pipes and wooden framing. There is a significant amount of white, fuzzy biological growth (mold or mildew) covering the surfaces, particularly on the pipes and the wood. The lighting is dim, highlighting the texture of the growth.  |

| OBSERVATIONS  | REFERENCE PHOTO   |
|---|---|
| 9. The first two joists on the underside of the east side of the first level are in poor condition, with significant deterioration. |  A close-up photograph of a wooden joist in a basement. The wood is heavily weathered and shows signs of significant deterioration. A red-handled screwdriver is placed against the joist for scale. Below the joist, there is a rusted metal pipe or fitting. The surrounding area is cluttered with various pipes and electrical conduits. |
| 10. The wood beam is supported on the masonry wall at the east side of the basement.  |  A photograph showing a large wooden beam supported on a masonry wall. The beam is positioned horizontally and is supported by a vertical masonry wall on the left side. The wood shows some staining and wear. The background shows other structural elements of the basement, including other beams and pipes.                            |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>11. The wood beams are supported at the interior of the basement with wood columns, that are in turn bearing directly on concrete foundations.</p> |  A photograph of a basement interior showing a network of wooden beams. A central, thick wooden column supports the beams. The floor is concrete, and there are some pipes and ductwork visible in the background.              |
| <p>12. The first column from the east appears to be lower than the others. This condition is creating a noticeable slope on the first level.</p>      |  A close-up photograph of a wooden column supporting a wooden beam. The ceiling structure above the beam shows a noticeable slope, indicating a structural issue. There are some pipes and ductwork visible in the background. |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>13. The bases of the wood columns are rotting, and are in poor condition.</p> <p>Also note that the concrete slab appears to be just a thin topping over the original slab or footing.</p> |  A close-up photograph showing the base of a wood column where it meets a concrete slab. The wood is heavily rotted and discolored. A red-handled screwdriver is placed on the concrete surface next to the column base to provide a sense of scale. The concrete appears to be a thin topping over a larger footing. |
| <p>14. Individual wood posts have been added, presumably to address specific issues of deterioration or sagging floors due to heavy loads in the past.</p>                                    |  A photograph of a vertical wood post supporting a ceiling structure. The post is made of light-colored wood and is positioned in front of a white wall with a window. The ceiling above shows some sagging and structural elements.   |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>15. The masonry bearing walls are in overall good condition. The north wall of this space separates 4140 and 4142 Fremont, and supports the floor and wall framing for both addresses.</p> |   |
| <p>16. The steel lintels over window openings are heavily corroded, and are in poor condition.</p>  |  |

**OBSERVATIONS**

**REFERENCE PHOTO**

17. The concrete floor appears to be a thin slab or topping. Some areas are in poor condition, with cracking and minor heaving evident.



**4142 Fremont Ave.**

18. The building is a one story retail building with the west side fronting on Fremont Avenue. 4142 is the north portion of this building.



**OBSERVATIONS**

**REFERENCE PHOTO**

19. The east side of the building is constructed with painted brick masonry. Some deterioration of the brick masonry is evident, likely due to moisture being trapped in the masonry by the paint.



20. A concrete block addition was also constructed on the east side. Some deterioration of the masonry is evident, including cracking and open joints.



| OBSERVATIONS   | REFERENCE PHOTO  |
|--|--|
| 21. The wood roof framing over the rear entrance is deteriorated due to water infiltration.  |  A photograph showing the interior of a crawlspace or attic area. The wood framing, including joists and rafters, is heavily deteriorated, with significant rot and missing sections. A dark, irregular hole is visible in the wood above a doorway. The walls are made of concrete blocks, and there are some pipes and electrical conduits visible. |
| 22. A crawlspace is located under the west half of the first floor. The floor is framed with wood joists, supported by masonry walls. The framing was mostly inaccessible for inspection, but appears to be in overall good condition. |  A photograph of a crawlspace. The floor is supported by wooden joists. The walls are made of masonry blocks. There are several pipes and electrical conduits running through the space. The area appears to be well-maintained and in good condition.   |

| OBSERVATIONS   | REFERENCE PHOTO  |
|--|--|
| <p>23. A basement is located under the east half of the first floor. The floor is framed with wood plank sheathing supported by wood joists, beams, and columns. All framing appears to be in overall good condition, with some localized deterioration.</p> |   |
| <p>24. The floor sheathing of the first floor is wet, with some deterioration on the east side of the building.</p>  |  |

**OBSERVATIONS**

**REFERENCE PHOTO**

25. Heavy biological growth is evident on the floor framing on the east side of the basement.



26. The first two joists on the east side of the first level are in poor condition, with significant deterioration.



| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>27. The wooden beam bears on the concrete masonry wall at the crawlspace. The block beneath the beam bearing is cracked and in poor condition.</p> |   |
| <p>28. The wood beam bears on the masonry wall at the east side of the basement. The wood is deteriorated and in poor condition.</p>                  |  |

| <b>OBSERVATIONS</b>  | <b>REFERENCE PHOTO</b>  |
|--|---|
| <p>29. The wood columns bear directly on the concrete floor, and appear to be in overall good condition.</p> |  A close-up photograph showing the base of a vertical wood column. The wood is dark, weathered, and shows signs of decay and insect damage at the point where it meets the concrete floor. A black cable runs across the floor to the right of the column.                 |
| <p>30. The masonry foundation walls are in overall good condition.</p>                                       |  A wide-angle photograph of a basement interior. The walls are made of light-colored masonry blocks. The ceiling is exposed, showing wooden joists, pipes, and electrical conduits. The floor is concrete. The overall condition of the masonry walls appears to be good. |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>31. The window openings on the east side of the basement have been infilled with concrete masonry.</p> |  A photograph showing a section of a basement wall. The wall is made of concrete masonry blocks. A rectangular window opening has been filled with a similar concrete masonry material. The surface of the wall is somewhat uneven and shows signs of wear or moisture.                 |
| <p>32. The concrete floor is in overall good condition, with some minor cracking and heaving.</p>         |  A photograph of a concrete floor in a basement. The floor is light-colored and shows some minor cracking and discoloration. A black cable runs across the floor from the foreground towards the background. In the background, there is a concrete wall and some equipment or debris. |

**OBSERVATIONS**

**REFERENCE PHOTO**

33. A portion of the roof framing was visible. It is apparent that the framing is charred from a previous fire.



**4146 Fremont Ave.**

34. The building is a two story mixed-use retail and apartment building, with the west side fronting on Fremont Avenue.



| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>35. The north side of the exterior wall is covered with metal siding. Due to the inset configuration of the upper level, the wall is likely not masonry construction.</p>  |   |
| <p>36. The south side of the exterior wall is covered with metal siding. Due to the inset configuration of the upper level, the wall is likely not masonry construction.</p> <p>Some movement of the brick veneer on the west elevation may be occurring at isolated locations.</p> |  |

**OBSERVATIONS**

**REFERENCE PHOTO**

37. The lower level of the east side of the building is constructed with painted brick masonry. Some deterioration of the brick masonry is evident, likely due to moisture being trapped in the masonry by the paint.

The upper level walls are covered with metal sheet siding, and are likely not masonry.



38. A wood framed addition was constructed on the south side of the roof. The addition appears to be partially constructed on the roof of 4142 Fremont, but the space is accessed through the upper level of 4146 Fremont.



| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| <p>39. A basement is located under the entire building. The first floor is framed with wood plank sheathing supported by wood joists, beams, and columns. All visible framing appears to be in overall good condition, with some localized deterioration.</p> <p>This photo is of the south half of the basement.</p> |  A photograph of a basement interior showing several vertical concrete columns supporting a ceiling with exposed pipes and ductwork. The floor is concrete and appears somewhat worn. |
| <p>40. A basement is located under the entire building. The first floor is framed with wood plank sheathing supported by wood joists, beams, and columns. All visible framing appears to be in overall good condition, with some localized deterioration.</p> <p>This photo is of the north half of the basement.</p> |  A photograph of a basement interior showing a row of vertical concrete columns. The ceiling has exposed pipes and ductwork. The floor is concrete.                                  |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| 41. The wood columns bear directly on concrete foundations on the south half of the basement. |  A photograph showing a vertical wood column resting on a square concrete foundation. The wood is light-colored and shows some wear. The concrete is dark and has some white residue or mold on its surface. The background is dark, suggesting an indoor basement setting.   |
| 42. The wood columns bear on raised concrete blocks on the north half of the basement.        |  A photograph showing a wood column resting on a raised concrete block. The wood is light-colored and shows some wear. The concrete block is light-colored and has some white residue or mold on its surface. The background is dark, suggesting an indoor basement setting. |

| OBSERVATIONS   | REFERENCE PHOTO   |
|--|---|
| 43. Some wood joists are deteriorated in isolated locations.   |  A close-up photograph showing a wooden joist that has been severely deteriorated by rot. The wood is dark, charred, and crumbling. A screwdriver is placed horizontally against the joist to provide a sense of scale. The surrounding area shows signs of moisture damage and mold on the concrete or masonry surfaces.    |
| 44. The second level floor framing uses heavy timber joist framing, likely to support the second level walls that are inset, not aligning with the foundation walls on the north and south sides (see Photos 35 & 36). |  A photograph of a crawlspace showing heavy timber joist framing. The joists are large, dark, and appear to be made of solid wood. They are supported by a metal pipe. The space is dimly lit, with a light source visible in the background. White baseboards and a white door are visible on the right side of the frame. |

| OBSERVATIONS  | REFERENCE PHOTO  |
|---|--|
| 45. The second level is completely finished with plaster walls and ceilings. Some minor cracks are evident. |  A photograph of an interior room with light blue walls and a white ceiling. The ceiling shows signs of damage, including a large hole and exposed wooden joists. There are two windows with white frames. The floor is dark and appears to be in poor condition. |

## DISCUSSION

This report addresses the visible components of the structures at 4140 – 4146 Fremont Avenue North. The property was originally constructed as two separate buildings; a one story building at 4140 and 4142 Fremont, and a two story building at 4146 Fremont. The age of the buildings is unknown, but estimated to be at least 70 years old.

The wood frame structure that is visible in the basement is in overall good condition, with some isolated components in poor condition due to deterioration. Other than a few openings in the walls and ceilings, the upper levels of the property are completely finished, making observations of the wall and roof framing not feasible. No determination of the structural condition of the upper levels or roof has been made other than what is specifically discussed in this report.

Observations of the exterior of the buildings were included, as movements and other deterioration evident in the exterior is sometimes an indication of hidden structural issues. Although there is some amount of deterioration and cracking of the exterior masonry walls, it does not appear to be a result of any structural deficiencies. The investigation and recommendations for the correction of the deterioration of the exterior walls is outside of the scope of this report.

The foundations of these structures appear to be in overall good condition and performing well. Some of the window openings have been infilled with concrete masonry, while others are covered with plywood. The window openings on the east side of the building have steel

lintels supporting the brick masonry above. These steel lintels are corroding and should be replaced.

The deterioration of the wood framing identified in the observations above is all due to excessive moisture or water infiltration. Significant biological growth discovered in 4140 and 4142 Fremont on the underside of the first level floor structure on the east side of the basement is an indication that there is excessive moisture in the wood framing members. The deterioration of the wood floor sheathing, joists, and beams is also the result of water infiltration along the east side of the building. This water infiltration must be corrected prior to the repair or replacement of the deficient wood framing identified above. Although the investigation and recommendations for the correction of the water infiltration is outside of the scope of this report, it is typically the result of poor site drainage.

The apparent sagging floor on the first level of 4140 Fremont is not caused by settling foundations, but rather from the deterioration of the base of the wood column. The columns are deteriorating due to moisture being wicked up from the damp concrete floor and foundations. This can be corrected by installing column bases such as what has been installed under the columns on the north half of the basement at 4146 Fremont. Although they are not currently structurally deficient, the columns at 4142 Fremont and the south half of 4146 Fremont would also benefit from the installation of bases under the columns to prevent future deterioration.

The concrete slab on grade is cracked and has evidence of minor heaving in all of the basements of this property. None of the conditions noted are considered a structural deficiency, but can be corrected if the basements are to be used as occupied spaces.

## **RECOMMENDATIONS**

The following are recommendations for the items that have been identified in the observations above to be structurally deficient:

### **4140 Fremont**

- Deteriorated first level floor joists on the east side of the basement: All wood joists with biological growth and decay should be removed and replaced. This will likely include the replacement of some of the wood floor sheathing as well.
- Deteriorated wood column bases: The bottoms of all of the wood columns should be cut off and new concrete or steel column bases installed.
- Corroded steel lintels over window openings: Replace the lintels with new galvanized steel angles to match existing. The brick masonry above will likely need some repair as part of this replacement.

### **4142 Fremont**

- Deteriorated roof framing over rear entrance: Remove and replace the wood framing to match existing.

- Deteriorated first level wood floor sheathing on the east side of the building: Remove and replace all decayed wood floor sheathing.
- Deteriorated first level floor joists on the east side of the basement. All wood joists with biological growth and decay should be removed and replaced: This will likely include the replacement of some of the wood floor sheathing as well.
- Cracked concrete masonry under beam bearing at the crawlspace: Remove and replace the one cracked concrete block beneath the beam bearing.
- Deteriorated beam bearing at east masonry wall: Install a steel angle bolted to the wall to act as a new beam bearing.

**4146 Fremont**

- Deteriorated first level floor joists: Install new floor joists for the entire length of the joist adjacent to any deteriorated joist.

**Estimated Costs**

The following cost estimates are for budget purposes:

| Description   | Estimated Cost  |
|---|-----------------|
| <b>4140 Fremont</b>                                   |                 |
| Replace deteriorated first level floor joists         | \$4,300         |
| Replace deteriorated wood column bases                | \$4,500         |
| Replace corroded steel lintels over window openings   | \$4,000         |
| <b>4142 Fremont</b>                                   |                 |
| Replace deteriorated roof framing over rear entrance  | \$3,700         |
| Replace deteriorated first level wood floor sheathing | \$1,000         |
| Replace deteriorated first level floor joists         | \$4,300         |
| Replace cracked concrete masonry under beam bearing   | \$1,000         |
| Install new beam bearing support at east masonry wall | \$1,700         |
| <b>4146 Fremont</b>                                   |                 |
| Replace deteriorated first level floor joists         | \$1,800         |
|   |                 |
| <b>Total</b>  | <b>\$26,300</b> |