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October 30, 2020

Vergas Economic Development Authority
PO Box 32
111 Main Street
Vergas, MN 56587

Attention: Julie Lammers

Subject: Structural Condition Assessment
105 E Main Street
Vergas, MN
Project Number: 20.066

Dear Ms. Lammers,

The purpose of this letter is to report the findings of a structural condition assessment of the building located at 105 E Main Street in Vergas, MN as directed by Julie Lammers.

BACKGROUND

The Vergas Economic Development Authority is considering purchasing the building located at 105 E Main Street in Vergas, MN and would like to have a structural condition assessment to assist them in their decision-making process.

DESCRIPTION

The structure is a single-story building with a full basement under the original building. There was a single-story slab-on-grade addition on the south end of the original building. The building foundation consisted of a boulder foundation wall at the original building. The above grade structure was constructed with wood floor joists, wood stud walls and a wood frame roof structure.

OBSERVATIONS AND COMMENTS

A site observation was conducted by Jason Schik, PE of Schik Engineering on October 28, 2020 and the following items were noted:

General

a. For reference in this report the main street side of the building will be referenced as the north side of the building.
b. The original building was approximately 50’-0” wide by 80’-0” long. The addition on the south end of the building was approximately 50’-0” wide by 14’-0” long.
c. The grade elevation on the west side of the building was approximately level with the floor system. The grade on the east side of the building was approximately 4’-0” below the floor system. See photo #1 for the grade change at the front of the building.
d. See photos #1-4 for the exterior views of the building.

Foundation

a. The foundation walls on the north, south and east sides of the original structure were constructed with bolder gravity foundation walls. Based on the thickness of an interior stone wall, it is assumed that the foundation walls are approximately 2'-0" thick.
b. The foundation wall mortar was able to be removed by hand at multiple locations. There were piles of lose mortar at the base of the foundation wall throughout the basement.
c. The northwest corner of the foundation had failed and soil had infiltrated into the basement. See photo #5.
d. There was a horizontal crack in the foundation wall on the north end of the east foundation wall near an existing opening that had been filled with concrete. See photo #6.
e. The north side of the west foundation wall had a stepped gravity retaining wall system which consisted of a 3'-0" tall boulder foundation wall and a 4'-4" tall brick wall. See photo #7. The retaining wall was offset to the inside of the exterior wood frame wall. The footing or foundation wall construction below the exterior wood frame wall was unable to be verified.
f. The center of the west foundation had a crawl spaced foundation system that extended into the basement.
g. The south end of the west wall appeared to have a shotcrete or cementitious coating. The west end of the south wall was cracked and showing signs of distress. See photo #8. The south wall of the crawl space had experienced failure and soil from the crawl space had infiltrated into the basement. See photo #9.
h. There was an interior boulder foundation wall on the south side of the basement that was approximately 2'-0" wide.
i. There was a pier on the north foundation wall which supported the center roof beam. The pier experienced significant deterioration and was missing a boulder. See photo #10.
j. There were large voids in the stone foundation wall on the east side of the south foundation wall. See photo #11.
k. There was a masonry wall on the east side of the building that supported a concrete slab. The wall was showing signs of distress. See photo #12. The slab was approximately 3'-0" wide and was snow covered at the time of the site observation. The snow on top of the slab was removed at the distressed masonry wall to better observe the slab. The slab sloped toward the building at the location that the slab was observed. The roof sloped from west to east resulting in the slab collecting the entire roof drainage.

Floor

a. The floor system of the original building was constructed with rough cut 2x8 joists at 16" on center.
b. There was a 2" gap between the base of the wall and the sub floor at the north end of the east wall. See photo #13.
c. The floor system was out of level throughout the entire floor system by up to 2". There were several rows of beams and columns that appeared to have been added in attempt to re-level the floor. The wood beams varied between sawn lumber and rough-cut lumber. Several of the columns were centered below the beams creating a cantilevered beam condition. The columns varied between sawn lumber, rough sawn lumber, and log columns. See photo #14. There were no visible signs of footings being added below the added columns.
d. Several of the untreated wood columns were absorbing moisture from the concrete slab. See photo #15.
e. The floor on the west side of the original building sloped down approximately 2" towards the exterior wall over a length of 8'-0".
f. The wood plate below the floor joists on the west side of the building experienced significant rot and was crushed and split below the floor joists. See photo #16.

g. The floor on the east side of the original building sloped up approximately ½" towards the exterior wall over a length of 8'-0".
h. The floor joist on east side of the building were pocketed into the foundation walls. The floor joist experienced various degrees of rot at the bottom of the joist where the joist contacted the foundation wall. The rot at several joists extend over an inch into the joist. See photo #17.
i. Beams and columns were installed below the significantly rotted joists to support the floor system at the foundation wall. See photo #18.

Walls

a. The exterior walls of the existing building were constructed with wood studs.
b. The west wall of the original building was out of plumb by approximately 3".
c. The east wall of the original building varied from level to out of plumb by approximately ½".
d. The north and south walls appeared to be relatively plumb.

Roof Structure

a. The roof structure for the original building consisted of wood frame construction and a wood beamline near the center of the building. The center beamline beared on (3) steel columns and (1) 2x built up wood column. See photo #19.
b. The roof construction was able to be verified to be wood construction through a small access hole on the west side of the building.
c. The wood beam above the suspended ceiling on the south end of the original building had been reinforced by bolting an additional wood member on each side of the existing beam. See photo #20.
d. The roof structure appeared to have experienced noticeable deflection in the original building.
e. The addition on the south end of the building consisted of a mono slope roof. The roof construction was not able to be verified due to finished materials.
f. The observation of the roof construction was limited due to inadequate access to the attic space. Schik Engineering is available to provide further observation of the roof structure if adequate access to the roof structure is provided by the building owner.

STRUCTURAL REVIEW

A structural engineering review of the conditions noted above was conducted and the following items were noted:

a. The foundation walls have experienced distress or failure at multiple locations.
b. The slab on the east side of the building appears to be directing water towards the building.
c. The joists and sill plates in contact with concrete and soil were not treated. The joists and sill plates at multiple locations have experienced severe rot and deterioration. Current building codes require all wood in contact with soil or concrete to be treated. Untreated members exposed to moisture or in contact with concrete are likely to experience continued rot and decay and lead to additional building movement.
d. The columns that were added in the basement are not adequately treated and appear to bear on the existing slab. These columns should bear on adequately sized spread footings.
e. The west wall has experienced significant movement. The rot and crushing of the wood plate below the floor joists on the west side of the building likely contributed to the condition.
f. The observation of the roof structure was limited due to inadequate access to the attic space and the presence of finished materials. Based on the limited observation it appeared that the roof system had been reinforced in the past and portions of the roof may have experienced significant deflection over the life of the structure.

PROFESSIONAL OPINION

The existing structure has experienced significant movement and distress over the life of the building. The repairs required for the building to be structurally stable and meet the requirements of the code may include but are not limited to:

- Repair and/or reconstruction of the existing foundation wall.
- Modification to the foundation wall for a new connection between the foundation wall and floor joists. Due to the foundation construction and condition of the foundation walls reconstruction of the foundation walls may be required.
- Reconstruction of the wood beams and columns that have been added in the basement.
- Add new footings under new columns and beams in the basement.
- Reconstruction and/or repair of the floor system.
- Temporary shoring of the foundation walls during floor system construction.
- Reconstruction of the exterior slab and masonry wall on the east side of the building.
- Reconstruction or replumb the west exterior wall.
- Possible reinforcement and reconstruction of the roof system.
- Additional repairs and reinforcements may be discovered after the removal of existing finishes.
- Additional repairs and modifications may be required for architectural, mechanical, electrical, and plumbing requirements.

The repairs required to repair the building and bring it up to the current code would be substantial and would exceed the cost of new construction. It is my structural engineering opinion that the building be razed and a new structure be built in its place.

GENERAL

Schik Engineering's scope of services is limited to a structural condition assessment and does not include the review of environmental (hazardous material), architectural, mechanical or electrical building elements.

The information, observations and opinions stated in this report are based on a site observation conducted by Jason Schik, PE. The observation consisted of a visual walk-through observing exposed elements and those accessible without the removal of finished materials.

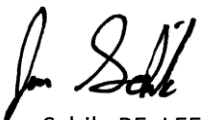
The observations and opinions expressed in this report are based on professional engineering judgment and professional practice, as well as a visual observation.

All works shall be completed in accordance with this document, standard industry practices and the requirements of the Code.

No other engineering was performed or requested for this project.

Please contact me with any questions.

Sincerely,



Jason Schik, PE, LEED® AP

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 professional engineer under the laws of the State of Minnesota.

Jason Schik
Minnesota Registration #47529

Date: 11-03-20

Photo #1 – North exterior wall

Photo #2 - West exterior wall

Photo #3 – South exterior wall

Photo #4 – East exterior wall

Photo #5 – Foundation wall failure at northwest corner

Photo #6 – Horizontal crack at north end of east wall

Photo #7 – North end of west foundation wall

Photo #8 – Foundation wall distress at west end of south wall

Photo #9 – Foundation failure on south end of crawl space

Photo #10 – Pier deterioration on north wall

Photo #11 – Large voids in south foundation wall

Photo #12 – Distressed masonry wall on east side of building

Photo #13 – Gap between east wall and floor sheathing

Photo #14 – Additional beams and columns supporting floor system

Photo #15 – Moisture at bottom of column

Photo #16 – Rotted plate below floor joists on west wall

Photo #17 – Joist deterioration at east wall

Photo #18 – Beam and column below joists at east wall

Photo #19 – Interior beams and columns

Photo #20 – Wood beam reinforcement