



Albertson Engineering Inc.

October 1, 2020

Daniel Ainslie
City of Sturgis
1040 Harley Davidson Way
Sturgis, SD 57785

RE: 1219 W Main St. Assessment
Sturgis, SD
Albertson Engineering File #2020-383

Mr. Daniel Ainslie,

On September 30th, 2020, Aaron Hartwell with Albertson Engineering Inc. (AEI) reviewed the building at 1219 W Main St. in Sturgis, SD with respect to observing general conditions. The observation was conducted with Roger, the on site manager, being present.

The on-site review conducted by AEI was not exhaustive in nature. Observations made were limited to areas of only visually apparent items. No destructive testing was completed nor was a complete review made of the construction for compliance with applicable code requirements. This report should not be considered a guarantee; no warranty is implied.

As requested, we have prepared a structural observation report based on our findings while on site. The following will provide a brief description of the conditions and information provided by the manager, existing conditions, site observations, and recommendations based on findings.

EXISTING CONDITIONS & OBSERVATIONS

On September 30, 2020 observations were made of the visible conditions at the previously referenced structure. Some of the items observed of note include:

- General description of the building and framing:
 - Building is primarily a single story structure with the south portion of the building having a subterrain basement. A stairway provided access to the roof framing where floor planks had been added for storage space above the ceiling. Age of the original construction is unknown but is typical of that of the early 20th century.

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- The main floor was a concrete slab on grade except above the basement, which was a concrete slab supported by steel joists framing. The steel framing was supported either by the basement concrete walls around the perimeter or interior wood heavy timber beam and post lines.
- There is some cracking in the main floor slab and the floor does appear to be uneven in elevation throughout. Measurements of the floor slab elevation were not taken at the time of this observation. Unevenness of floor may likely be to underslab subgrade movement which is not uncommon for a building of this age.
- The floor of the basement is likely a concrete slab on grade. Concrete surface appears to be in good condition.
- The interior posts in the basement did not appear to have a connection to the beams at the top nor to the concrete floor at the bottom. In some locations a wood shim was added in the gap between the top of post and bottom of beam indicating only a friction fit. (photo 1)
- At the concrete basement walls where the wood beams tied in it appears that a rough cut pocket was provided for the wood beam to sit on. Some locations had wood shims in between the bottom of the beam and the concrete pocket (photo 2)
- The foundation of the main building was not observed due to it being buried.
- The exterior walls of the building are believed to be made up of concrete throughout. Finishes covered the walls in most of the interior with some of the original concrete being exposed in some spots. Exterior finishes covered the south, east, and west walls. The north wall concrete surface was completely exposed. The bottom section of the northeast corner showed some damage (photo 3). Cause of damage is unknown.
- Interior pilasters were spaced at approximately 15ft on center along the west and east walls. Pilasters were covered by finishes but are believed to be concrete cast integrally with the concrete walls as they appear to align with the steel roof truss locations.



- There is a ceiling framed with 2x joists supported by the bottom chord of the steel trusses. Nearly all of the ceiling was covered by finishes from the underside.
- Curved top chord steel trusses supported the roof framing. The steel trusses were composed of angles riveted together. The top and bottom chords were composed of double angles and the web members were single angles. Steel plates were used to connect the web member to the trusses. In one location some web members were removed for access to a door (photo 4). A vertical member was added at one end of the removed web members.
- 2x8 joists at 24" c.c. sat atop the steel joists which had a wood nailer plate bolted on top of the top chord. It appears in a few locations that openings in the roof framing had been infilled with newer joists (photo 5). At the south end wall the 2x joists were either pocketed into the concrete wall or fastened to a wood ledger that was attached to the concrete wall. Treated wood did not appear to be used. The north wall was not observed but is assumed to have a similar support condition.
- On the southeast section of the roof there was over-framing on top of the steel truss to form a cricket in the roof to slope to the north.
- The east exterior wall above the ceiling appears to be wood framed with it being much newer than the original building. From the exterior that wall extends up above the roof to form a parapet. That wall was covered by metal panels on the outside from top to bottom. The transition from concrete wall below to wood wall was not observed.
- Wood planking was used on top of the roof joists for which the roofing materials are assumed to be attached to. Wood planking was also used as the flooring members above the ceiling joists in the storage areas.





Photo 1: Wood shim in between post and beam



Photo 2: beam bearing on concrete pocket in wall with shim



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Photo 3: Damaged section of concrete wall on north east side



Photo 4: truss with web members removed



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Photo 5: Roof framing with newer infill framing

OPINIONS

Based upon the all of information gathered and observations made, the building overall appears to be in fairly good condition with a few areas that may need to be further analyzed.

- The load capacity of the framing supporting the main floor slab in the basement is unknown. Depending on the intended future use, the design live load may need to be adjusted above the capacity of the floor. The floor does not appear to have been overloaded in the past, as evidences of failures were not observed.
- Untreated wood in contact with concrete can be a place for rotting in the wood to develop. It does not appear that significant rot has occurred from the surface of the wood beams and joists that were observed.



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- The north wall has an area of damage and some cracking on the surface due to the age of the building and it being fully exposed. These areas can be a conduit for moisture infiltration into the building.
- The load capacity of the steel roof trusses has not been analyzed by AEI and is unknown. The effect on the truss of removing some of the web members is unknown.
- In areas of the roof where previous openings have appeared to have been infilled with framing, the joists on either side of the opening are carrying more load than the rest of the joists due to the header tying into the side of those joists. It is not known if the joists have the capacity to carry the additional load.

RECOMMENDATIONS

Based upon observations made and opinions prepared, our recommendations are presented in the following sections.

- The framing supporting the main floor slab in the basement area should be analyzed if the use of the main floor space is to be changed. At a minimum there should be positive connections provided between the posts and beam at the top and floor at the bottom. We can provide connection details if required.
- Wood members being supported by concrete should have a moisture barrier provided in between the surfaces to mitigate the influx of moisture into the wood.
- The north wall is recommended to have some type of weather proof barrier/finish installed similar to the other walls. An architect or contractor specializing in this area should be retained to provide their expertise in this area. At a minimum the damaged area of wall should be repaired. We can provide notes and repair steps to complete a repair of the wall if the owner chooses to do so.
- The roof framing in infilled areas around previous openings and the steel trusses with web members removed should be analyzed to determine if the existing conditions have the capacity to carry the code required loading. We can provide an analysis of the framing if the owner chooses to do so.



Thank you for the opportunity to review the building and present our report of recommendations. If you have any questions, please don't hesitate to call.

Sincerely,

Albertson Engineering Inc.

A handwritten signature in black ink, appearing to read "Aaron Hartwell", written in a cursive style.

Aaron Hartwell, PE, SE



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