

June 6, 2023

Mr. Dan Cutshaw, PE
ms consultants, inc.
115 West Washington Street
Suite 1310
Indianapolis, IN 46204-1618

Re: Structural Condition Assessment
Smith Building
113 East Main Street
Thorntown, IN

CE Solutions' Project No: 23-137

Dear Dan:

As requested, a structural condition assessment of the referenced building at 113 East Main Street in Thorntown, Indiana was performed on May 23, 2023 by Atallah Sayegh, P.E. of our office. The purpose of this assessment was to observe the general structural condition of the existing 2-story building. The Town of Thorntown, IN has purchased the Smith Building located at 113 East Main Street, Thorntown, IN. The existing roof and 2nd floor of this building has partially collapsed. CE Solutions has been asked to perform an overall Structural Condition Assessment of this building to assist the Owner with potential next steps. The existing drawings for the building were not available.

Our condition assessment was restricted only to the portion of the exposed building structure and was based solely on visual observation. No structural instrumentation, monitoring, testing or evaluation of the building's original structural design was performed. Selective photographs taken by the undersigned during our inspection are included in Appendix B of this report. The following is a summary of our observations, findings and recommendations:

BUILDING DESCRIPTION

The building is located on Main Street in Thorntown, Indiana. The building is 2-story building with brick facade. There is a basement under the building. It is unknown when the building was constructed but it appears from the type of construction that it may have been built in early 1900's. The building has two separate adjacent spaces with openings between the two spaces at all the levels. The total building width is approximately 42' and the depth approximately 80'. See photos 01 through 04 for the exterior front elevations of the building.

EXISTING CONDITIONS AND OBSERVATIONS

Roof Framing:

The existing roof consists of 2x8 wood rafters and 2x8 ceiling joists at 16" on center. The wood rafters and ceiling joists span east west and bear on multi-wythe brick walls. In some locations,

there is plastered ceiling applied to the bottom of the ceiling joists. The roof slopes down from the front to the back.

- There are several locations where the roof sheathing and roof rafters have deteriorated due to water damage. Daylight can be seen at several locations. The roofing and ceiling material are deteriorated in many locations.
- There are some locations at the northwest side of the building where shoring on the second floor was used to support the roof rafters.
- See photos 53 through 69.

Second Floor Framing:

The existing second floor framing consists of 2x10 wood joists at 16" on center. The wood joists span east west and bear on multi-wythe brick walls.

- The second floor at the east building has very severe sagging and deterioration due to the water damage.
- Several plastic pools and buckets on the second floor were used to collect water infiltrating from the deteriorated roof. This has added additional loads to the second-floor framing and caused some wood joists to fracture and completely fail.
- It appears that some efforts were made to partially support the second-floor framing.
- There are several locations where the floor sheathing boards are missing.
- The stairway from the first to the second floor is soft and deteriorated from water damage.
- See photos 41 through 52.

First Floor Framing:

The existing first floor framing over the basement consists of 2x12 wood joists at 16" on center. The wood joists span east west and bear on multi-wythe brick walls and at intermediate wood post/beam system.

- The floor at the east building is soft due to water damage. The flooring and joists are saturated with water due to water infiltration from above.
- At the west side of the building, a large amount of debris was allowed to accumulate on the floor. The floor in this area has been shored up with timber as can be seen from the basement level.
- Some wood posts were installed with notches, rendering them inadequate to support the floor loads.
- The stairway from the first floor to the basement is soft and deteriorated from water damage. There is no wall or railing for fall protection around the stair opening.
- See photos 24 through 40.

Interior Walls:

The building walls consist of multi-wythe brick. At the basement level, the brick walls are approximately 16" thick. Above the basement level the brick walls are approximately 12" thick. In some areas the brick is exposed while in other areas it has been plastered over. The interior brick walls appear to be in good condition.

Exterior Front Walls:

The building exterior façade at the front of the building is painted brick with a front canopy.

- The front brick façade appears to be in a fair condition.
- There are some diagonal cracks and slight outward displacement in the brick above the arched windows.
- Two window lintels appear to have been replaced with wood timber lintels in place of the original stone lintels.
- The front brick wall at the east building is not connected to the roof. Daylight can be seen between the roof edge and the brick wall (see photos 56 and 57). The parapet at this wall has deteriorated and failed as can be seen on the roof (see background in photo 69).
- The front canopy appears to be in a fair condition. The soffit panels have been displaced from the main building wall.
- See photos 01 through 05.

Exterior Back Walls:

The brick walls at the back of the building are exposed red brick while in some locations plaster/stucco was applied to the brick.

- The back brick walls appear to be in a fair to poor condition.
- The bottom half of the back wall has been plastered over perhaps due to deteriorated brick condition. The top part of the wall has been painted.
- At many locations at the back wall, the brick mortar joints have deteriorated due to moisture migration into the joints. It is difficult to assess the extent of the brick joint deterioration at the painted and plastered locations.
- See photos 06 through 13.

Exterior Parapet Walls above Roof:

- The brick wall parapets above the roof have deterioration at the brick mortar joints and at the brick wall caps. Part of the parapets are painted, so it is difficult to assess the extent of the deterioration.
- The flashing against the brick wall is also deteriorated in several locations allowing moisture and water to infiltrate down into the building space.
- See photos 63 through 69.

REVIEW OF EXISTING DRAWINGS

The existing drawings for the building were not available.

OPINION AND RECOMMENDATIONS

The building is currently in a poor uninhabitable condition due to severe water infiltration, moisture and mold. It appears that the building has not been regularly maintained and was allowed to fall into a severely deteriorated state. Several plastic pools and buckets on the second floor were used to collect water infiltrating from the deteriorated roof. This resulted in additional load on the floor framing causing the floor to deflect and fail at the east portion of the building. The same is true at the first-floor framing where the floor framing is saturated with water.

Should the Town of Thorntown decide to rehab the building, we propose the following general recommendations for repairing and/or replacing the deficient structural parts of the building. See architectural recommendations for any architectural items not covered under this Structural Condition Assessment.

1. Immediate action is required to resolve some of these issues. These measures are temporary until permanent repairs are implemented.
 - Cover any roof opening where there is water infiltration to reduce additional damage to the roof and levels below.
 - Remove all pools and buckets full of water on the second floor to reduce the stress on the existing floor framing.
 - Remove all debris on the first floor at the northwest area of the building to reduce the stress on the existing floor framing.
 - Brace the top of the front brick wall (the wall with the arched windows) to the roof structure.
 - The building should not be occupied until all permanent repairs have been completed.
 - See items 2 through 10 below for permanent repairs recommendations.
2. Replace roof sheathing and roof rafters that have been damaged due to water infiltration. It is estimated that approximately 1500 SF of roof structure may have to be replaced. It is difficult to see certain areas due to existing ceiling finishes.
3. Replace second-floor sheathing and floor wood joists that have been broken or damaged due to water infiltration including the stairway. It is estimated that approximately 1500 SF of the second-floor structure may have to be replaced.
4. Replace first-floor sheathing and floor wood joists that have been damaged, including the stairway into the basement. It is estimated that approximately 650 SF of the first-floor structure may have to be replaced.
5. Replace two timber posts with notches in the basement with new timber posts.
6. Repair diagonal cracks in the brick wall above the arched window at the front wall.
7. Connect the top of the brick wall to the roof structure at the front wall with the arched windows and repair/rebuild the brick parapet above the wall.
8. Replace the two wood window lintels at the front wall with stone lintels to match the original stone lintels.
9. Repair and tuck point deteriorated mortar brick joints at the back wall. It is estimated that approximately 600 SF of brick wall where mortar joints may have to be repaired at the back wall.
10. Repair and tuck point deteriorated mortar brick joints at the side wall parapets. It is estimated that approximately 550 SF of brick wall parapets where mortar joints may have to be repaired.

See attached OPSCC in Appendix A for a rough order of magnitude, Opinion of Probable Structural Construction Cost for recommended repairs, augmentation or strengthening of structural deficiencies observed during our visual structural condition assessment. Please note that this OPSCC only includes the structural elements and does not include construction contingencies, design fees for preparation of any construction documents for repairs, architectural elements and finishes, MEP repairs, moisture or mold remediation, or other project soft costs. Dollar amounts are current as of the date of this assessment. Long term implementation of the recommended repairs presented herein may result in additional building deterioration and in an increase of the

anticipated construction cost.

Please note that our condition assessment was limited strictly to those items identified in this summary and to the extent noted. Should unforeseen/hidden deficiencies exist, they are beyond the scope of this inspection. This condition assessment does not include structural analysis or evaluation of the building's original structural design or any documents for repair or augmenting the structural elements mentioned in the report. These are beyond the scope of this condition assessment report. Should you have any questions or wish to discuss our observations and recommendations further, please do not hesitate to contact the undersigned. Thank you again for choosing CE Solutions.

Sincerely,



Atallah Sayegh, P.E.
Senior Project Engineer

Enclosures: Appendix A – Opinion of Probable Structural Construction Cost
Appendix B - Photographs

Appendix A – Opinion of Probable Structural Construction Cost

Opinion of Probable Structural Construction Cost

WORK ITEM	QUANTITY	UNIT	UNIT COST	TOTAL
1. Remove/Demo Parts of Existing Roof and Floors				
Remove/demo part of roof framing	1,500	SF	\$8.00	\$12,000
Remove/demo part of second floor framing	1,500	SF	\$8.00	\$12,000
Remove/demo part of first floor framing	650	SF	\$8.00	\$5,200
Subtotal				\$29,200
2. Temporary Bracing of Brick Walls at Roof & Floors				
Temporary wall bracing during repairs	1	LS	\$7,500.00	\$7,500
Subtotal				\$7,500
3. Repair & Replace Roof & Floors				
Repair and replace roof sheathing and wood rafters	1,500	SF	\$20.00	\$30,000
Repair and replace second floor sheathing and wood joists (including stairway)	1,500	SF	\$20.00	\$30,000
Repair and replace first floor sheathing and wood joists (including stairway)	650	SF	\$20.00	\$13,000
Remove and replace two timber posts in basement	2	EA	\$100.00	\$200
Subtotal				\$73,200
4. Front Brick Wall Façade Repair				
Repair diagonal cracks in the brick wall above the arched window at the front wall	1	LS	\$500.00	\$500
Connect the top of the brick wall to the roof structure at the front wall (at wall with the arched windows)	1	LS	\$3,000.00	\$3,000
Repair/rebuild the brick parapet above the front wall (at wall with arched windows)	60	SF	\$40.00	\$2,400
Replace the two wood window lintels at the front wall with stone lintels to match the original stone lintels	2	EA	\$500.00	\$1,000
Subtotal				\$6,900
5. Rear Brick Wall Repair				
Remove, repair and tuck point deteriorated mortar brick joints at the back wall	600	SF	\$20.00	\$12,000
Subtotal				\$12,000
6. Side Walls Roof Parapets Repair				
Remove, repair and tuck point deteriorated mortar brick joints at the side wall parapets	550	SF	\$20.00	\$11,000
Subtotal				\$11,000
Construction Subtotal				\$139,800
General Conditions	20	%		\$27,960
Mobilization & Demobilization	10	%		\$13,980
Design Contingency	15	%		\$20,970
Please note that this OPSCC only includes the structural elements and does not include construction contingencies, design fees for preparation of any construction documents for repairs, architectural elements and finishes, MEP repairs, moisture or mold remediation, or other project soft costs.				
GRAND TOTAL				\$202,710

Appendix B – Photographs



img_20230523_01



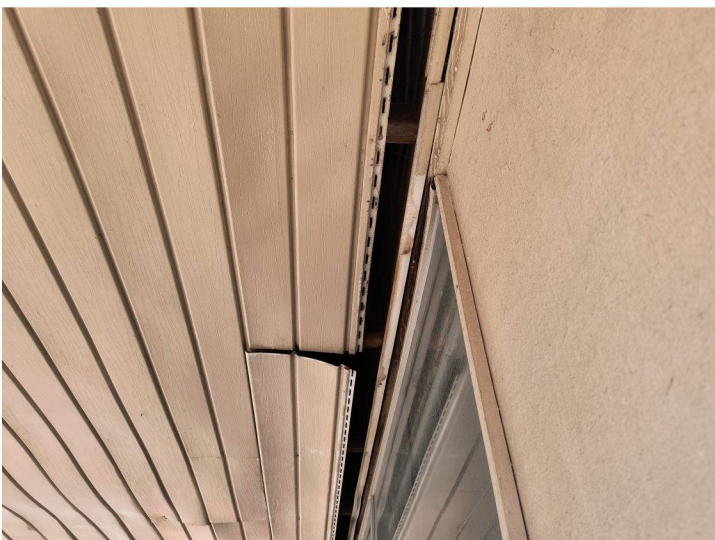
img_20230523_02



img_20230523_03



img_20230523_04



img_20230523_05



img_20230523_06



img_20230523_07



img_20230523_08



img_20230523_09



img_20230523_10



img_20230523_11



img_20230523_12



img_20230523_13



img_20230523_14



img_20230523_15



img_20230523_16



img_20230523_17



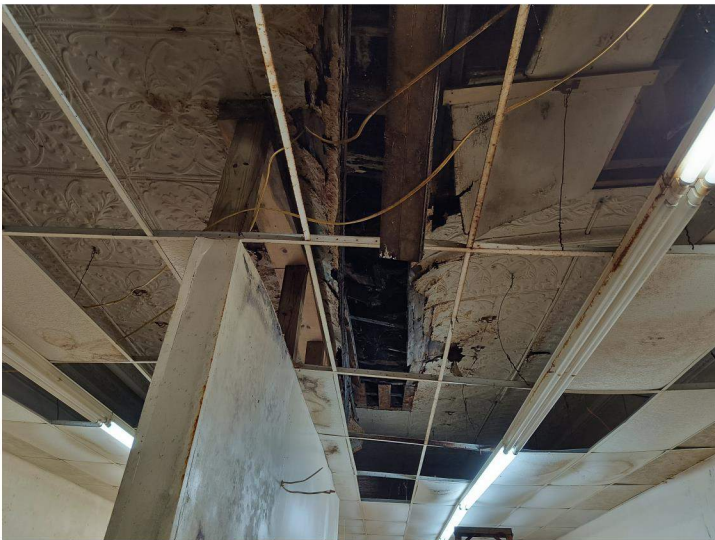
img_20230523_18



img_20230523_19



img_20230523_20



img_20230523_21



img_20230523_22



img_20230523_23



img_20230523_24



img_20230523_25



img_20230523_26



img_20230523_27



img_20230523_28



img_20230523_29



img_20230523_30



img_20230523_31



img_20230523_32



img_20230523_33



img_20230523_34



img_20230523_35



img_20230523_36



img_20230523_37



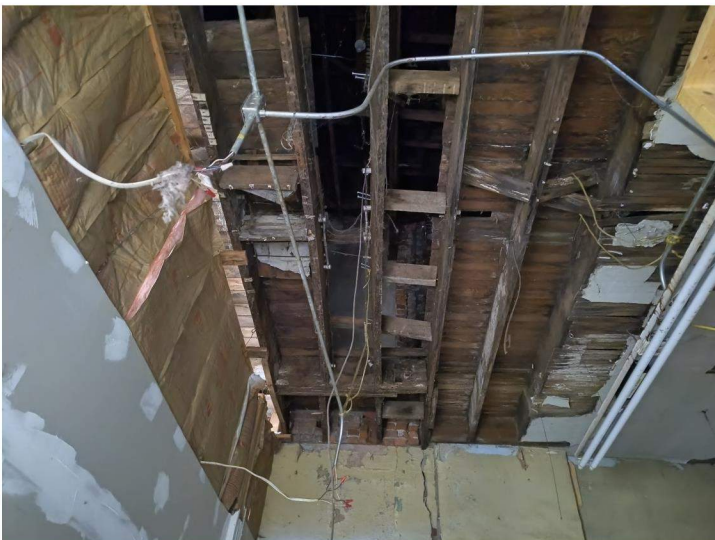
img_20230523_38



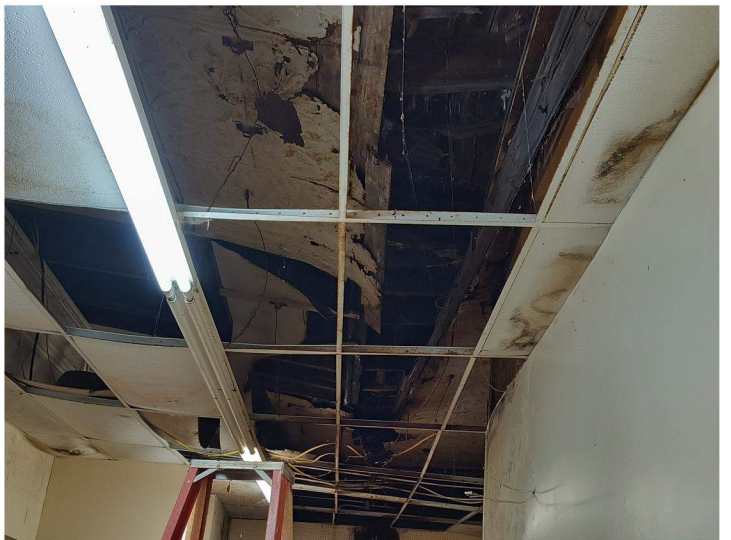
img_20230523_39



img_20230523_40



img_20230523_41



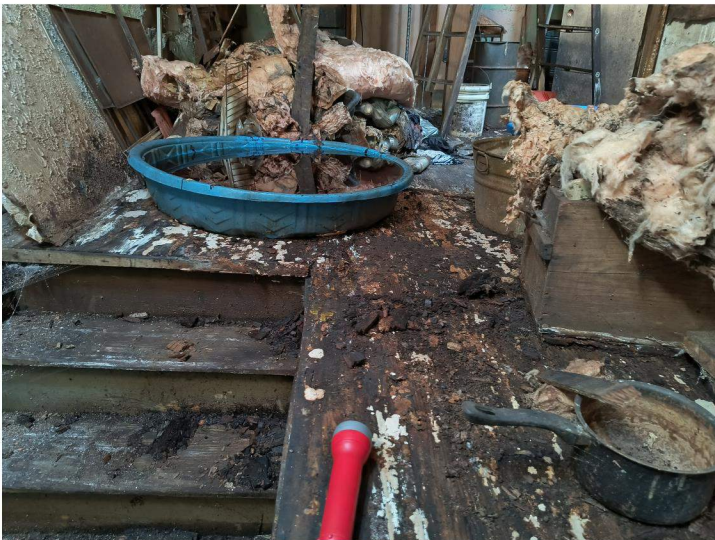
img_20230523_42



img_20230523_43



img_20230523_44



img_20230523_45



img_20230523_46



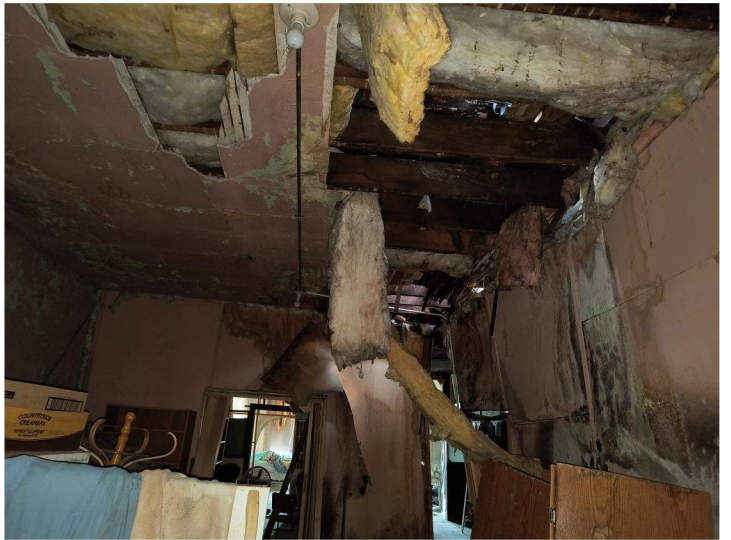
img_20230523_47



img_20230523_48



img_20230523_49



img_20230523_50



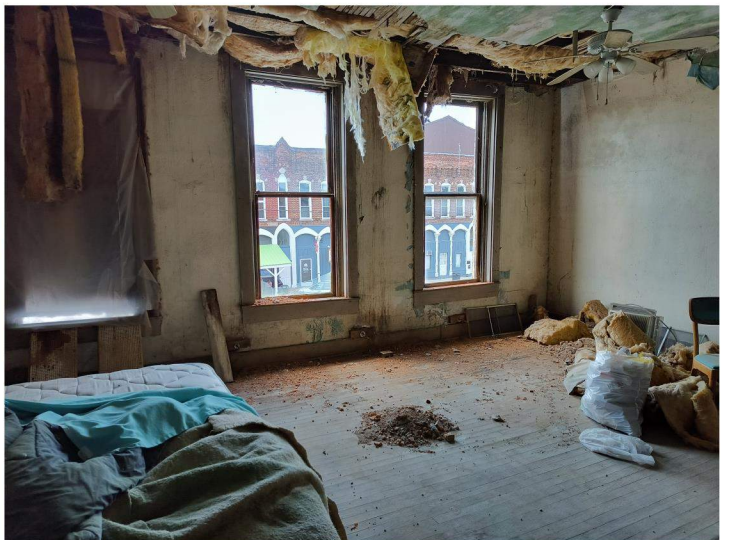
img_20230523_51



img_20230523_52



img_20230523_53



img_20230523_54



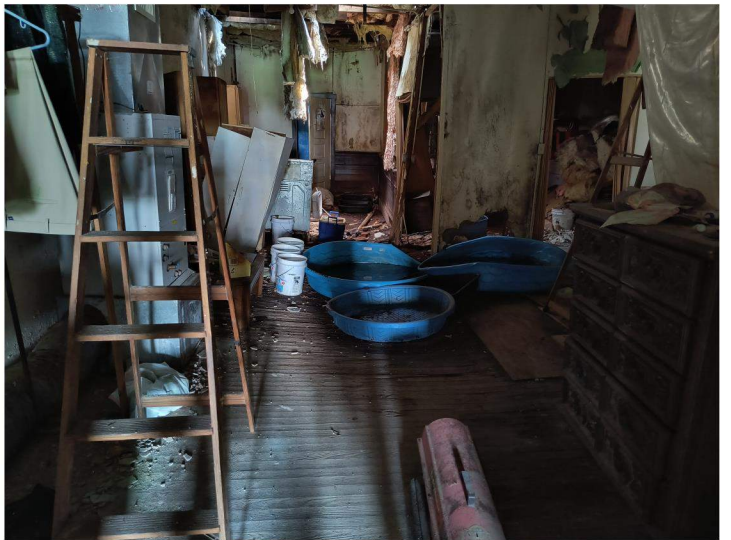
img_20230523_55



img_20230523_56



img_20230523_57



img_20230523_58



img_20230523_59



img_20230523_60



img_20230523_61



img_20230523_62



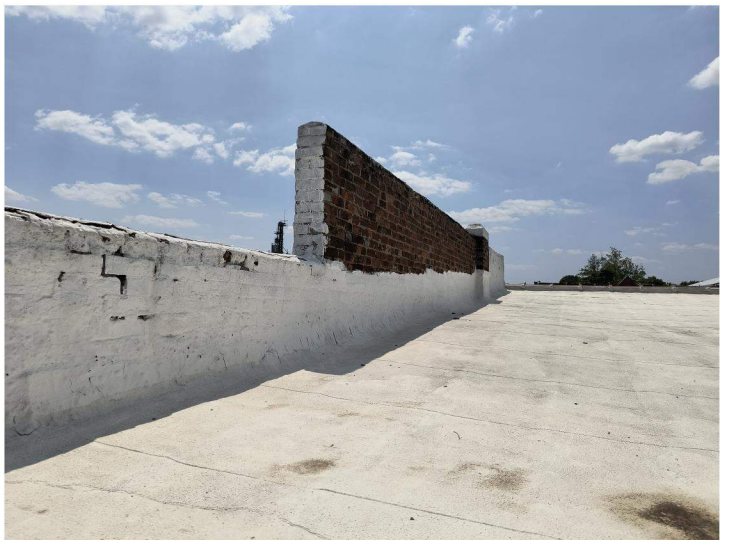
img_20230523_63



img_20230523_64



img_20230523_65



img_20230523_66



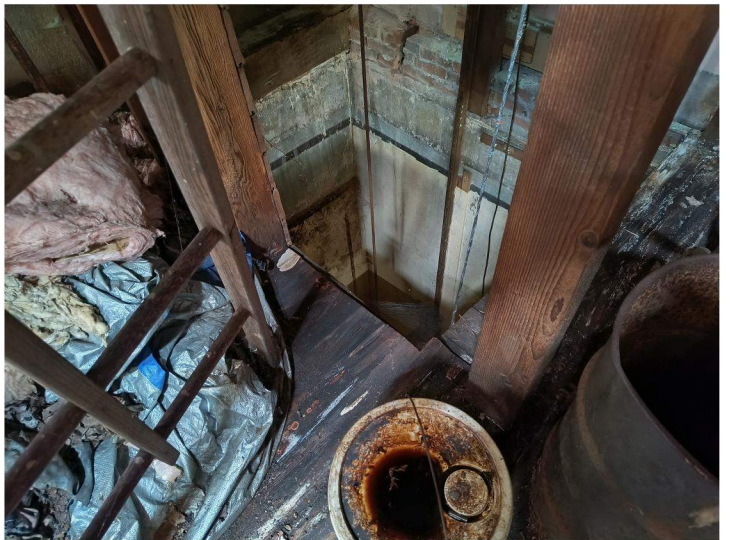
img_20230523_67



img_20230523_68



img_20230523_69



img_20230523_70