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Building Inspection Report
for
Flint House



Front Elevation



Rear Elevation

Prepared for:
**Village of Scotia Historian
Beverly Clark**

Observation Date: April 4, 2025
Weather: 60's Partly Cloudy
Report Date: May 14, 2025
Observed by: Timothy Schroder, PE

As requested, Enginuity Engineering & Design has conducted an inspection of the Flint House building at 421 South Reynolds Street; Scotia, NY 12302.

The objective of this assessment was to visually inspect the building to gain an understanding of its overall structural condition as part of a historic preservation effort.

During our site investigation we accessed all accessible areas of the building. There is one area of the roof over the west addition that we were not able to gain access to.

The report is based on a visual, non-destructive, non-invasive inspection of the structure. Items reported are from observations while on site and photograph review during preparation of the report.

Existing Structure Description:

Note: Referenced building sides are, when looking at the front of the structure from the street, Side A (front) East facing, Side B (left side), Side C (rear of structure), and Side D (right side).

Action Items are in ***Bold Italics***.

The structure, dating back as far as 1750 with subsequent renovations and additions, consists of:

- The main section: a two-story wood framed building with a brick over rubble foundation.
- Two + sections of single story additions on the C-side (west).
 - o The primary section of the west addition has a stone rubble foundation with a kitchen, bathroom, and dining room.
 - o The secondary section of the addition, furthest west, has a low roof and a wood floor with a crawlspace or slab-on-grade.

The exterior walls of the building have either aluminum siding (sides B, C, and D) or wood on the A-side.

There is a wood porch (built circa 2006) on the A-side of the building with a flat roof and composite decking.

Exterior:

1. At the west side of the north wall there is a metal window well. The window well is full of debris above the window sill elevation.

Remove debris from window well and confirm grade elevation is 4-6" below the window sill.



2. At the east end of the north wall there is a concrete window well. The concrete is broken and displaced. The window well is full of debris above the window sill elevation.

Remove debris from window well and confirm grade elevation is 4-6" below the window sill.

Repair or replace window well.



3. The masonry chimney on the D-side of the building has broken/missing bricks and mortar at several areas, especially the top.

Repair and repoint chimney as recommended by a qualified mason.



4. The masonry chimney on the D-side of the building has open flues and the roof flashing is in poor condition.
Open flues in a chimney can lead to premature failure of the flue liner.

***Have a qualified chimney sweep inspect the chimney prior to future use and remediate per their recommendation.
Install metal caps on the flues to prevent water infiltration and damage.***



5. Existing asphalt shingle roof on entire house is in poor condition.

Replace all existing roofing and flashing to prevent water infiltration.



6. Moss growth was observed on several area of the roofing.
Growth of any organics on the building will lead to premature deterioration.

Remove organic growth from building and maintain surfaces free of future growth to minimize potential issues for building.



7. Bushes were noted to be close to the face of the building in multiple areas.

Trim bushes back and maintain a clear space of 18" to building to minimize moisture issues for the building.



8. The base of the south column on the front porch was observed to have significant deterioration. The other column bases on the porch also were observed to have some moisture damage also.

Column bases should be repaired as required using deterioration resistant materials.



9. Finish trim boards around the porch and on the A-side of the building were noted to have some deterioration due to moisture.

Repair/Replace damaged trim boards with deterioration resistant materials.



10. Roof leader on southeast corner of porch was noted to be disconnected and discharging water on the column accelerating deterioration.

Reinstall leader and discharge water way from building.



11. The south handrail for the front steps has been removed and the step wood framing is deteriorated.



12. The south chimney needs repointing at the exposed top section.

Repoint masonry to prevent damage to masonry



13. Exterior outlet on southeast corner of building does not have a weather proof cover.

Install weather proof covers on all exterior outlets



14. Exposed brick on B-side of main house is in poor condition and need to be repointed. It is unknown what the condition of the foundation brick is in other areas of the foundation due to being covered with finishes.

Repair/repoint foundation as required.



15. The foundation under the kitchen addition R105 is in poor condition on the south and west exposed sides.

Further review of the foundation is recommended.

Repair the foundation to prevent movement/damage to the foundation and addition.



16. Roof leader on southwest corner of building discharges as face of building and the grading in the area is not directing water away from building.

Sill beam on the west wall shown was observed to have rotted out.

Reinstall roof leader and extend away from building. Re-grade to slope away from building.

Deteriorated sill beam should be repaired with deterioration resistant materials and protected from moisture.



17. Plumbing vent from sanitary pump in basement discharges under eave of building adjacent to two windows.

Review vent location requirements for proper installation and remediate as required.



18. Roof R108 floor is less than 12" above grade and space is open to exterior. Grade appears to promote water entry into area and infiltration at foundation.

Remediate grading to prevent water entry and infiltration. Do not enclose crawl space without providing proper ventilation.



19. West addition roof does not have gutter and pavement is adjacent to building with a gully next to the building. The conditions may promote water infiltration into crawlspace. Water splashing on the building from the roof eave on to building will accelerate deterioration.

Remediate drainage issue. Installation of a gutter and proper drainage away from the building is recommended.



Attic

An access opening should be made into the concealed attic over the west addition for further evaluation and maintenance.

20. South chimney in attic is corbeled to center of roof and has an enlarged top penetrating roof.. Corbeled chimney has creosote on exterior of brick masonry.

Chimney not currently in use should be inspected by a qualified chimney sweep prior to any future use.



21. Attic insulation consists of foil draped over joist with loose insulation on top. Unknown insulation in cathedral roof section.



22. North chimney on exterior was previously relocated from the interior of the building.

Note: plywood roof sheathing installed over previous chimney opening.



23. Attic ventilation is located on the two end gable walls. No ventilation was observed in cathedral section of roof from eaves. Mold was noted in several area of the roof indicating that the attic is not adequately ventilated.

Remove mold from attic space and provide proper ventilation.



Second Floor

24. Differential movement was observed between the south chimney and wood framed walls in room R203. The wood framing was noted to be settling.



25. Ceiling levels through-out second floor were noted to have deflection movement.



26. Windows on east side are close to porch roof elevation and have debris on roof. Window sash is missing and only storm window is installed (3 locations). It appears that water may be entering window opening from exterior.

***Patio roof should be cleared of debris and flashing to building inspected.
Window openings should be inspected for moisture damage are remediated as required.***



27. Room R202 ceiling has extensive cracking due to movement.



28. Interior wall was previously removed in room R202.



29. Ceiling repair at previously relocated north chimney



First Floor

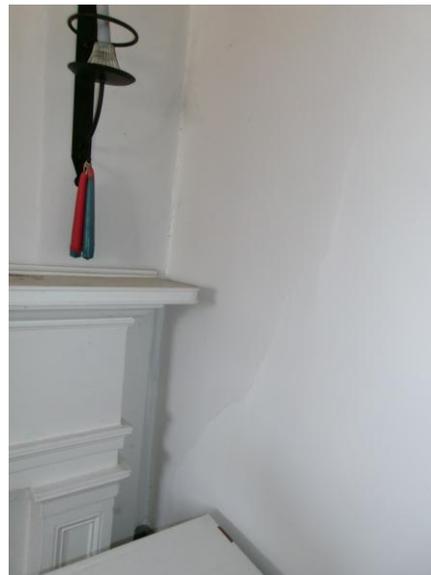
30. Added closets in room R101 appear to have settled separating from the ceiling. This indicates that the floor is deflecting below.



31. Ceiling of room R103 with damage reported from previous heating system failure.



32. West wall of room R103 adjacent to chimney shows signs of movement.



33. Ceiling of room R105 kitchen shows signs of previous water damage. Water staining was also noted on both sides of beam. It is unknown if the water damage is due to the plumbing system failure.



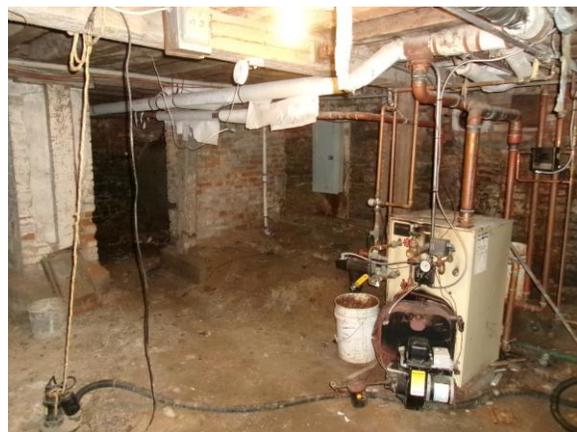
34. The support beam below the exterior wall above room R105 kitchen has a deflection of approx. 2"



Basement

35. Steam boiler and heating piping system is deactivated after previous reported puffback. Note pipes throughout space have suspected ACM materials.

Recommend having an asbestos survey performed on the building and remediating per the survey recommendations prior to performing ANY work in the basement.



36. Several notches of the first floor joist were noted for the installation of the heating system.



37. Center support beam over room B102 is supported on 2x4 posts. North end of beam end short of existing foundation. Likely was previously supported on removed north chimney. Beam was noted to have a deflection of approx.. 1 1/8"



38. Foundation of main house in northwest corner of room B102 is in poor condition and has settled.

Repair/rebuild wall to support loads above.



39. The east foundation wall of the building along its entire length is in poor condition and has signs of movement in several areas.

Reinforcement of the east wall is recommended to stabilize the wall and prevent further movement and potential failure.



40. Several first floor joist were noted to extend to the exterior wall but not properly supported or connected.

Repair connections and/or support of joist as required for floor loads.



41. Supplement wood posts have been installed in throughout the basement over the service life of the building. It is suspected that the posts were added to address localized floor deflection. However the based of all the supplemental posts have deteriorated and in most cases are not supporting the floor.



42. On the south side of room B101 a floor joist has broken and is bearing on a storage cabinet.

Replace or reinforce existing joist and remove cabinet.



43. At the doors leading from the main basement to the west addition basement the door headers are serving as structural supports for the first floor framing and posts are bearing on the wall footing unsecured.

Further evaluation and remediation is recommended to stabilize the floor framing.



44. Beam across room B101 running north-south is deflected approx.. 1 7/8".



45. Load bearing wall in northeast corner of B103 is in poor condition and has settled and is no longer supporting the floor framing above.

Rebuild wall to support framing.



46. There is a crack in the foundation east of the south chimney.



47. The Foundation enlargement supporting the south chimney and hearth was previously removed along with the hearth. The removal of the foundation previously supporting the hearth would generally not have a significant issue on the floor strength.



48. Floor joist over room B103 has split at the notched tenant connection to the west sill beam.



49. Wall between room B101 and B103 on the west end has a crack which appears to be due to settlement.



50. South foundation wall of room B104 has a large crack.



51. In north end of room B104 a sanitary grinder pump chamber has been installed. Previously noted vent under eave is from chamber and run directly overhead.



52. West foundation wall of room B104 was noted to be in poor condition.

Repair wall and/or provide stabilization bracing to prevent further movement and issues.



53. Crawl space under room R104 is close to grade. Floor framing in this area is 2x6. Note ventilation louver.



<p>54. West foundation wall of B102B is in poor condition. Note that the floor of the space has been lowered without addressing foundation bearing.</p> <p><i>Rebuild and/or brace wall to prevent failure.</i></p>	
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General Observations:

Basement:

- Basement appears to have been dug down approximately 10" below its original floor elevation. The base of wall footings were not reinforced to accommodate the lowered floor elevation. It is likely that the foundations are settling as a result contributing to movement issues observed in several areas of the structure.
 - ***It is recommended to address the foundation supports compromised due to lowering the basement floor previously. The foundations supports can be remediated by underpinning, confinement or installing a new basement floor slab at the original elevation.***
- Brick bearing walls in the basement have several areas where the bricks are missing or deteriorating, compromising the strength of the walls.
 - ***It is recommended that the areas of brick be repaired to properly support the framing above.***
- Where sill plates were accessible during the inspection were checked (from the basement side) for deterioration. Some deterioration was noted but generally were in serviceable condition with the exception of the area noted in item 16 above.
- Insect damage was observed in several locations throughout the first floor framing.
 - ***It is recommended to have the building inspected and remediated by a qualified pest control contractor.***
 - ***Insect damaged framing should be replaced or reinforced as required.***
- First floor framing was noted to have issues in multiple areas throughout the building. In their current condition the first floor is inadequate for the original residential loading for the building.
 - ***Further evaluation of the first floor framing is recommended to determine adequacy of the members and develop a program to repair and reinforce the floor framing.***
- The basement shows signs of water infiltration in multiple areas around the building. Additionally the dirt floor in the basement allows for moisture into the basement. The high moisture in the space will contribute to deterioration issues in the building framing. It was

noted that there is a dehumidifier in the basement but it was not operating at the time of our site observations.

- *It is recommended to keep the moisture levels in the building low to prevent further deterioration of the building framing.*
- *It is recommended to provide permanent passive protection to control moisture in the building.*

Discussion:

The Flint house has undergone numerous alterations throughout its serviceable life, which have impacted its overall structural integrity. The modifications along with typical serviceability concerns with light framed wood construction are contributing to the observed concerns with the building's structure. Our site investigation revealed several issues impacting the structure, specifically from previous building modifications.

From the exterior, it is evident that the roof of the main section of the house has significant movement. The movement is most pronounced at the ridge and along the west side of the main structure.

The movement is primarily the result of issues below the roof level along with the capacity of the roof framing.

The removal of a load-bearing wall in the kitchen space has telegraphed through the exterior wall, showing in the roof eave line. The deflection of the roof is clearly evident within the kitchen by the observed deflection of the support beam spanning the room. The deflection of the beam was measured to be approximately 2".

Similarly, the roof eave of the north end is also showing deflection. The deflection in this area appears to be due to issues with the supporting foundation below the bearing wall between room B102 and rooms B102A and B102B.

The differential settlement of the foundation is causing many of the observed concerns throughout the building. Differential settlement of building foundations is typical in buildings. However, the excavation and removal of the basement floor to a lower level, approximately 10 inches below the presumed original elevation, has impacted the bearing capacity of the soils below the foundation walls and increased the differential settlement of the foundations.

The removal of the basement floor has had a particular impact on the movement in the interior walls of the foundation, compromising the structural support of the building. The interior walls of the main section were observed to show the most significant movement and impact on the building structure. This increased movement includes the foundation wall between the main section and the west addition basements.

The movement of the foundation, combined with the floor framing capacity concerns of the first-floor framing, appears to be contributing to the balance of movement throughout the building. The first-floor framing has capacity concerns throughout the entire building and is easily observed in each of the main sections of the basement.

The concerns in the main section of the building are a combination of beams that have deflected, due to the loads imposed upon them, and the nominal sizing of floor joists. The main beam down the center of the basement space in room B102, on the north end of the main building, is of particular concern since the support on the north end of the beam was removed during prior alterations, presumably when the interior chimney was removed and relocated to the exterior. This beam, supporting room R102 on the first floor, is only supported by two built-up 2x4 posts in the basement.

Throughout the entire basement, several supplemental posts were previously installed to address localized concerns with floor settlement. These posts have since deteriorated at their base and are no longer supporting floor loads from above. All the observed posts in the basement were bearing on the dirt basement floor without footings or bases to prevent deterioration due to moisture infiltration from the soils.

Several framing support concerns were also observed for the connection of floor joists to the rim joists. The joists have deep notches and were, in some cases, not connected to the sill beam or supported by the foundation. Of particular interest are the headers over the doors between the main foundation and the west addition foundation area. The doors have structural headers that support the floor framing and are supported by posts bearing on the footings without bases.

Additionally throughout the first-floor framing, several joists were observed to have significant splits, insect damage, and deterioration. On the south side of room B101 a joist has broken and is supported by a cabinet stored in the basement.

The settlement of the foundation and first-floor framing has telegraphed through the building, showing up as movement on the second-floor ceiling and walls. The movement on the second floor has resulted in cracking of the plaster and wall paper in multiple areas of the second floor.

Damage to the plaster and wall paper finishes were particularly evident in room R202. It was noted an interior wall was previously removed in room R202. The wall, although intended to be non-load bearing, was contributing to the strength of the roof framing and acting as a load bearing wall. Removal of the wall has contributed to the increased damage to the finishes in this area.

The movement of the building elements supporting the second-floor ceiling and roof framing has imparted increased loads on the roof framing system. The A-frame roof construction is imparting more thrust on the second-floor exterior knee walls. The knee walls were observed to be out of plumb, leaning towards the exterior, up to 1" per foot. The movement of these walls is due to thrust from the roof rafters.

The movement of the walls is the result of the roof rafters being inadequate for the roof loading. Room R202, where the interior wall was removed, and R203, where the exterior wall is longer, show the greatest movement as would be expected.

Moisture infiltration is a significant concern for the lifespan of the building. Controlling moisture in the building, whether through damp air in the basement, water infiltration through the foundation walls, or infiltration through the roof and walls, is critical to the longevity of the building.

The dirt floor in the basement allows a significant amount of moisture into the building. During our site inspection the basement soil was damp in several locations and around the perimeter of the building there was soil stacked against the wall. It is unclear from our observations if the soil is infiltrating the building through the wall.

Installing a concrete slab and drainage stone to restore the original basement floor elevation, along with providing a perimeter French drain around the space, is suggested to address moisture and structural concerns.

Summary:

The Flint house has several structural concerns that need to be addressed to ensure its preservation and continued serviceability.

The primary issues include:

- 1) **Basement:**
 - a) The original foundation walls have movement concerns and cracks noted during the field investigation.
 - b) The basement floor was previously excavated down approximately 10 inches, is contributing to the foundation movement issues.
 - c) The lowering of the basement floor primarily impacts the interior walls.
 - d) Several interior basement walls were noted to have movement.
 - e) The brick sections of foundation wall are deteriorated.
- 2) **First Floor Framing:**
 - a) The first floor beams have excessive deflection.
 - b) The first floor joists are undersized.
 - c) The first floor framing has moisture damage, deterioration, and insect damage.
- 3) **Kitchen Support beam:**
 - a) The beam over the kitchen area, has a deflection of approximately 2 inches and the deflection is anticipated to increase over time.
- 4) **Roof Structure:**
 - a) The original roof structure is not adequate for the current building code prescribed loading.
 - b) Movement of the roof and second-floor knee walls was noted during our inspection.
 - c) Movement of the roof framing has been amplified by the removal of a previously load-bearing wall on the second floor, the settlement of the foundation and first floor framing deflection.
- 5) **Moisture Infiltration:**
 - a) The basement has a dirt floor and shows infiltration through the foundation walls.

Continued use of the building in its current state is of structural concern, as the existing first floor framing is inadequate for the code-required loadings for a residence. Any increases in loading of the building is not recommended due to the excessive deflection and damaged framing observed.

Damaged framing should be addressed as soon as possible to prevent issues with the building and ensure the safety of the occupants. Utilization of the building as a publicly accessible space is unsafe and should be prohibited until structural remediations are completed.

Furthermore, the proposed change of use into a museum has increased load requirements. The building is not adequate for the proposed change of use without structural remediation and reinforcements.

A full structural evaluation and review of the entire building for intended program and loading is recommended. From a full program and structural evaluation, a comprehensive renovation, repair, and reinforcement program and be developed.

The recommended order of items to address for the long-term serviceability of the building and future program needs are:

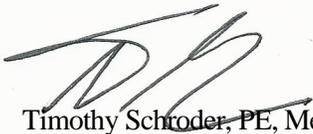
- 1) Repair of damaged first floor framing.
- 2) Evaluation and reinforcement of the beam over the kitchen space.
 - a) Reinforcement or replacement of this beam is recommended to prevent a more significant failure.
 - b) It is recommended to install a temporary shoring post under the midspan of the beam until designing installation of the permanent remediations can be completed.
- 3) Moisture mitigation:
 - a) Repair of gutters and down spouts.
 - b) Grading around building to ensure water is drained away from the structure.
 - c) Correcting window wells to prevent water entering basement through windows.
 - d) Continuous dehumidification of basement.
- 4) Stabilization and repair of existing foundations:
 - a) Repair cracks in foundation.
 - b) Install stabilization for existing foundation wall to prevent further movement.
 - c) Repair/rebuild interior load bearing foundation walls.
 - d) Install basement drainage, slab, and French drains.
- 5) Evaluation and remediation of existing first floor framing for current and future program requirements.
- 6) Evaluation and reinforcement of roof framing.
 - a) Further review and evaluation of the roof structure in combination with the entire building framing is recommended to develop a comprehensive reinforcing program.

Additional issues/concerns with the structure may be exposed when working on the structure and should be reviewed and remediated as required by the New York State Building Code.

If there are any questions, please feel free to contact me.

Observations made, and report prepared by:

Enginuity Engineering & Design, PLLC



Timothy Schroder, PE, Member

Relevant Definitions and Information:

Wood Memory: Wood memory refers to the tendency of wood to return to its original shape after being bent or deformed. This characteristic is due to the natural elasticity of wood fibers, which allows them to recover from temporary loads or stresses. However, if the load is sustained over a long period, the wood may not fully return to its original shape, leading to permanent deformation.

Progressive Deflection of Wood Members: Progressive deflection occurs when wood members (such as beams, joists, rafters, etc.) are subjected to sustained loads over time. Initially, the wood deflects under the load, and if the load remains, the deflection increases gradually. This phenomenon is known as "creep." Creep results in a permanent deformation of the wood member, even after the load is removed. Factors such as the type of wood, moisture content, and duration of the load influence the extent of progressive deflection.

Moisture- Wood: Moisture has a significant impact on wood memory and its overall performance. When wood absorbs moisture, it swells, and when it loses moisture, it shrinks. This cyclical process can lead to several issues:

1. **Dimensional Changes:** Wood's dimensions change with varying moisture levels. Swelling and shrinking can cause warping, twisting, and cracking, which can compromise the structural integrity of wood members.
2. **Progressive Deflection:** Moisture conditions, especially large repetitive fluctuations, influence the progressive deflection of wood members under load. This means that wood can gradually deform over time due to sustained moisture changes.
3. **Mechanical Connections:** Exposure to elevated moisture conditions or significant moisture cycling can compromise mechanical connections between wood members. This can lead to loosening of joints and fasteners, further affecting the stability of the structure.
4. **Biological Infestation:** High moisture levels increase the likelihood of biological infestation by fungi and insects. These infestations can degrade the structural integrity of wood, leading to further deterioration.
5. **Serviceability Concerns:** Moisture-induced damage can lead to excessive repair and maintenance costs. In extreme cases, the damage may justify premature demolition of wooden structures.

Overall, controlling moisture levels is crucial to maintaining the performance and service life of wood and wood products. Proper moisture management can prevent many of the issues associated with wood memory and ensure the longevity of wooden structures

Moisture- Masonry: Moisture can cause chemical reactions within the brick and mortar, leading to the breakdown of these materials.

Dirt Basement Floor: Dirt floor basements can significantly contribute to moisture problems in a building.

1. Dirt floors in basements allow moisture from the ground to seep into the space. This can lead to high humidity levels, which can cause deterioration issues in the building framing.
2. In a dirt floor basement, condensation can form on the walls and floor, leading to dampness.

Overall, controlling moisture levels in a dirt floor basement is crucial to maintaining the performance and longevity of the building. Proper moisture management techniques, such as installing a vapor barrier, improving drainage, and using a dehumidifier, can help mitigate these issues