To: Music Street Architects
11 Music Street, PO Box 3000, PMB# 3109
West Tisbury, MA 02575

From: Energylogik
455 State Road, PMB# 385
Vineyard Haven, MA 02568

Date: September 6, 2023

Subject: Gothard Residence: Studio Structural Assessment
11 Music Street
West Tisbury, MA 02575

Dear Mr. Gothard,

As requested by Josh Gothard, of Music Street Architects and the property owner, we performed two observational site visits at the above-referenced property. The goal of the visits was to observe the existing condition of the framing and foundations systems and determine what structural elements of the original Studio building can be preserved during a proposed repair and renovation project. Linwood Gallant, PE, visited the site on April 3, 2023, and August 24, 2023 and prepared this report. Josh Gothard was present during the first visit and provided access to the property.

OBSERVATIONS

During our visits, we performed visual inspections of the exterior and exposed portions of the first floor, second floor, and roof framing (see attached photographs below).

Exterior
At the exterior of the building, we noted several of the walls were visually out of plumb, in particular the east and west walls appeared to bow outward at the center along the eaves (see **Photo 1**). Around the perimeter of the building, we noted the siding was directly in contact with the exterior grade and observed deteriorated cladding and horizontal board sheathing (see **Photos 2** and **3**). At the northeast corner, we noted an exposed bottom plate atop a stone that exhibited significant signs of deterioration.

Roof Framing
The roof sheathing generally consisted of 1x square-edge boards, and we noted areas of staining consistent with condensation and past water infiltration (see **Photos 4**). We noted areas where the boards had deteriorated significantly, with fragments of the boards hanging down (see **Photo 5**). The rafters varied in size and spacing, but appeared to generally be 1" to 2" x 6" @ approximately 24" O.C. There was no ridge board, and we noted several deteriorated and split rafter ends at the ridge joints where we also observed exposed corroded toe-nailed connections. At the gable end walls, we noted deteriorated studs at connection and splice locations (see **Photo 6**). We could not directly observe the ceiling framing, due to the limited size of the access opening and the fiberglass batt insulation covering the ceiling.

Second Floor
At the second floor, we noted the interior finishes were in fair to good condition, indicating they had been maintained over the years (see **Photo 7**). We observed three exposed ceiling beams. However, based on their appearance, elevation above the eave wall plate, and the fact that one of them did not extend across the entire ceiling at the stair area, we do not believe these beams are effective as rafter ties.

First Floor
At the first floor, we observed the second-floor joists, their supporting beams, and the first-floor exterior walls (see **Photo 8**). The joists varied in size and spacing considerably, with sizes ranging from 2x5 to 3x5 spaced between 17" and 32" O.C. We observed a central beam, approximately 4x6 (on-the-flat), with a temporary screw jack column located at about mid span, that was set on a wood block on the finished flooring. The beam exhibited signs of long-term deflection and we noted several joists ends that it supports had been shimmed. The finished floor-to-joist and floor-to-beam heights were between approximately 6 feet and 6 feet 6 inches.

At the exterior walls, we observed horizontal board sheathing spanning up to 5 feet between posts that varied between 3x3 to 4x6 (see **Photo 9**). We noted 1x and 2x ledgers below the joists fastened to the interior faces of posts, discontinuous wall studs from the second floor that terminated at random heights above the first floor, and knee braces between the corner posts and bottom plates. At the south door opening, we noted a lack of a header above the over 7-foot-wide opening (see **Photo 10**).

Due to the low clearance between the first floor and exterior grade, we could not directly observe the first-floor framing, except at isolated areas where portions of deteriorated bottom plates were visible at the exterior.

DISCUSSION

Based on our observations, the existing structure was generally in poor condition and requires significant structural and building envelope repairs to the superstructure and foundations to make it a safe and habitable building. In addition to deterioration due to water infiltration and the lack of proper moisture control (ventilation and air/vapor barriers), each structural framing component had deficiencies associated with their size, spacing, and/or configuration.

At the wood-framed walls, the stud configurations and existing horizontal board sheathing do not provide adequate stability to the structure and at present is a deficient lateral resisting system not capable of withstanding current design wind loads. Movement of the building during past events is evidenced by how out of plumb several of the exterior walls appeared. Maintenance of exterior and interior finishes has hidden some of these deficiencies, but it's clear that shims had been used to adjust for the underlying structural alignment issues. Reinforcing or replacing all the exterior posts and the existing board sheathing with wood structural panels would be required to adequately stabilize the building. These improvements will also facilitate the necessary installation of a proper thermal envelope and air and vapor barriers.

The foundations below the first floor were not directly visible, except at areas of deteriorated siding/boards. However, the bottom plates we could observe were in poor condition and appeared to bear on stones at grade level. Based on the type of construction observed, it is likely that some of the exterior wall posts are embedded directly in the ground and are likely in poor condition. In our opinion the existing foundations have inadequate depth to be stable supports for the building. Replacement of the stones, bottom plates, and posts are required to provide adequate stable foundations. In addition, insulation and air and vapor barriers will need to be added below the first floor, which will be extremely difficult, if not impossible, to install with the existing depth below the first-floor framing. Reinforcing the existing first-floor beams and joists in place in this area is also likely impractical.

Like the wall framing, the exposed second floor and roof framing have deficient section sizes and spacings for their spans. In addition, the non-existent rafter thrust restraint mechanisms, inadequate ridge connections, inadequate eave uplift restraint, damaged and deteriorated roof sheathing, and improperly sized or missing headers need to be addressed as they create deficient condition that will continue to worsen and potentially destabilize the structure. Due to these deficiencies, reinforcing and reconfiguration or replacement of the second floor and roof framing will be required.

RECOMMENDATIONS

In our opinion, due to the extent of existing structural damage and deficient framing conditions, the safest and most economical solution is to demolish the existing structure and replace it with a new structure on new foundations.

While it may be technically possible to repair each element of the building individually, due to the extent of repairs required, significant temporary measures would be required to stabilize the structure to safely complete the repairs. In addition, the extent of reinforcing required would completely alter the depths of all the wall, floor, and roof assemblies. At the first-floor level, increasing the structural depth of the second-floor framing would create a head-height clearance that would be impractical for typical occupancy uses. To alleviate the clearance issues, the entire building would need to be raised in elevation. As a result, it is my opinion that repairing the structure in place does not appear economically viable, nor the safest approach, nor logical from a preservation perspective.

CLOSING

This report was prepared for the exclusive use of Energylogik, Music Street Architects, the property owners, and the Town of West Tisbury and is not intended for any other purpose. Unless otherwise noted, our report was based on observed site conditions and the information available at the time of our inspections. We reserve the right to amend this report and our conclusions if new information becomes available and revisions are necessary and warranted.

If you have any questions or require additional information, please let me know.

Thank you,

Digitally signed by Linwood Gallant
Date: 2023.09.06 16:47:57-04'00'

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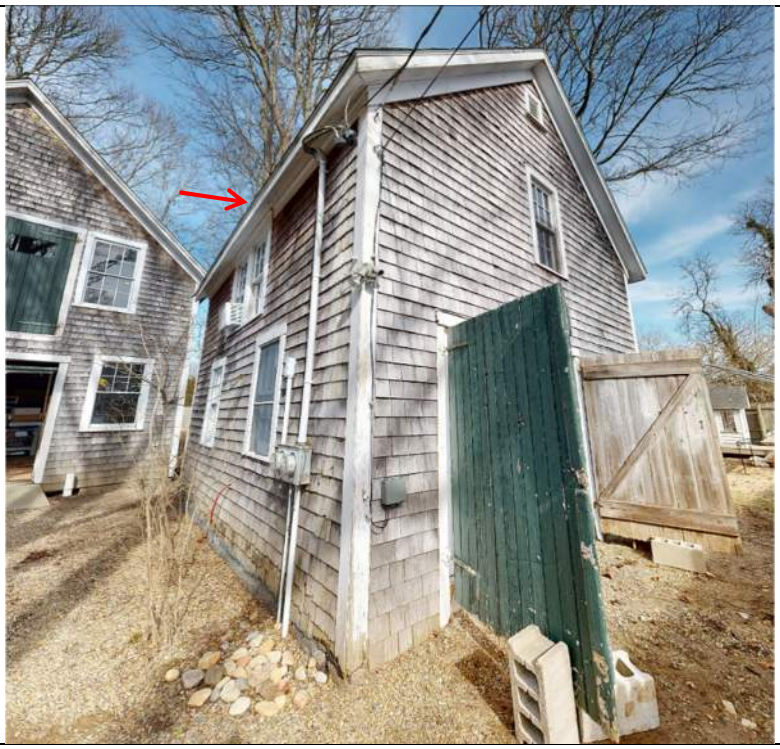
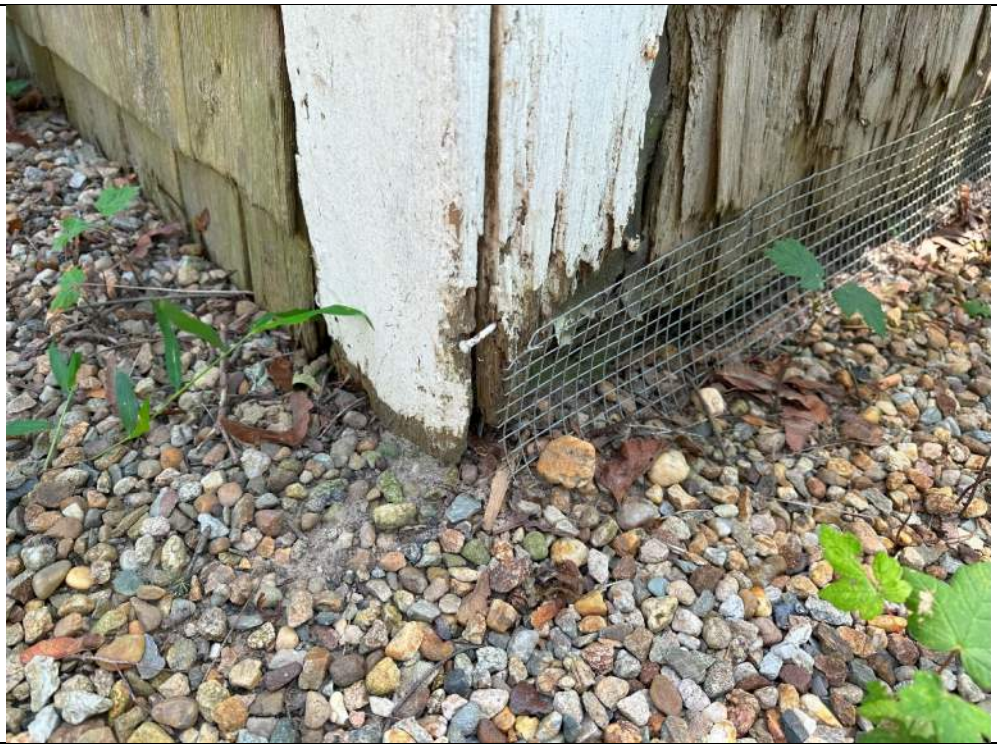
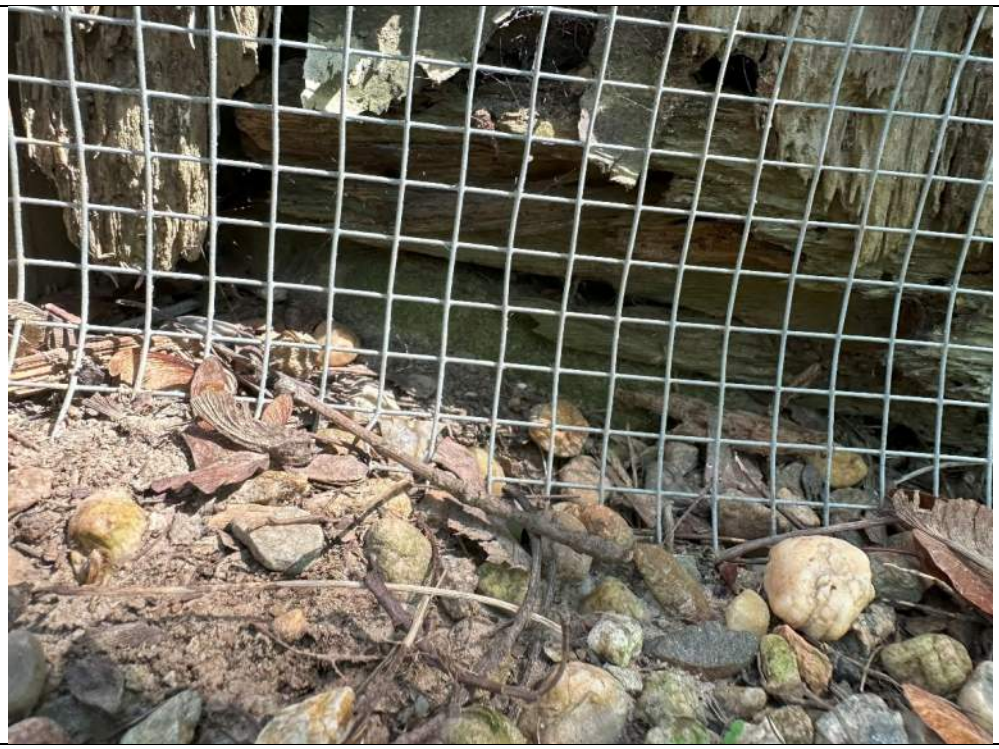


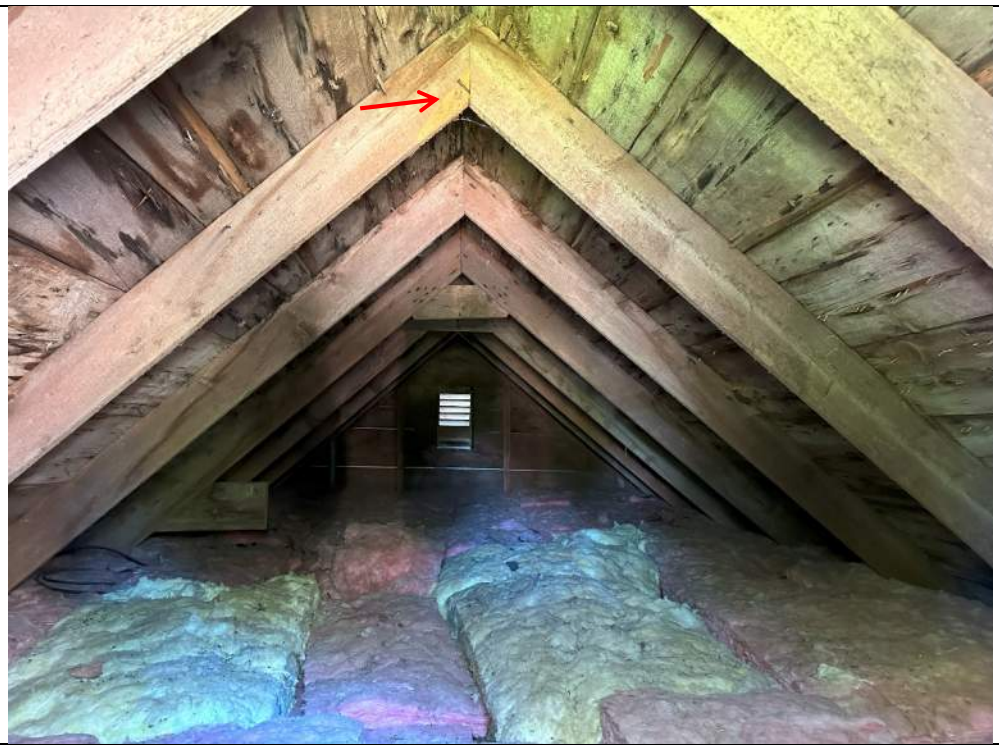
Photograph 1 – View of front (south elevation). Note staining and deteriorated siding at base of walls, and bow in center of roof at the eave



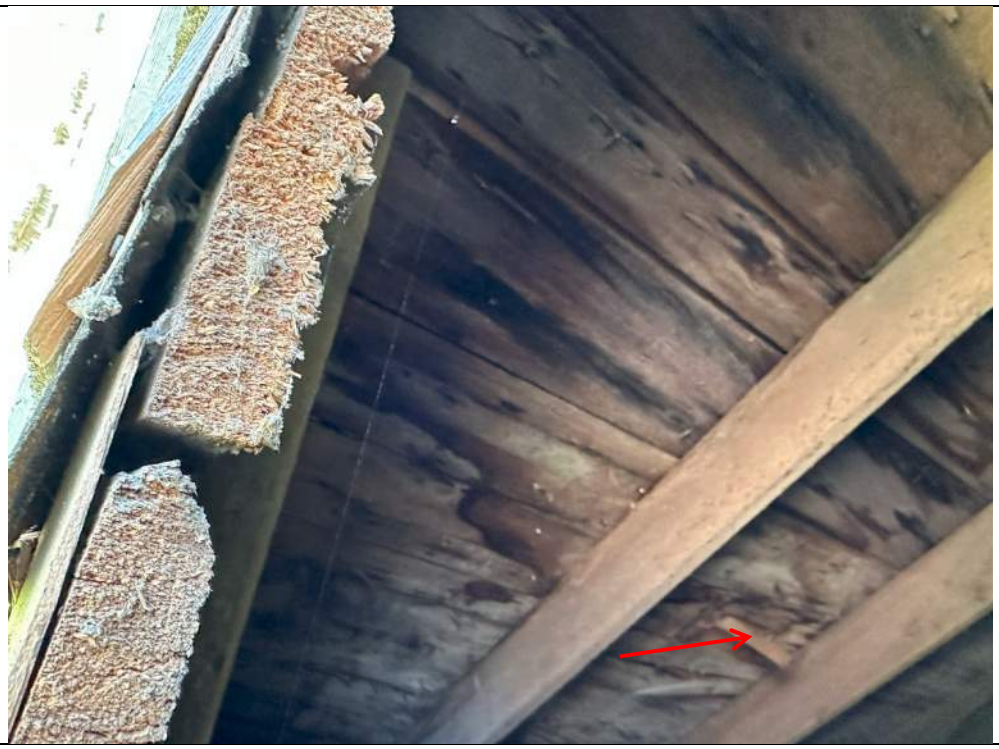
Photograph 2 – Close-up view of Northeast corner. Note deteriorated cladding and horizontal boards beneath



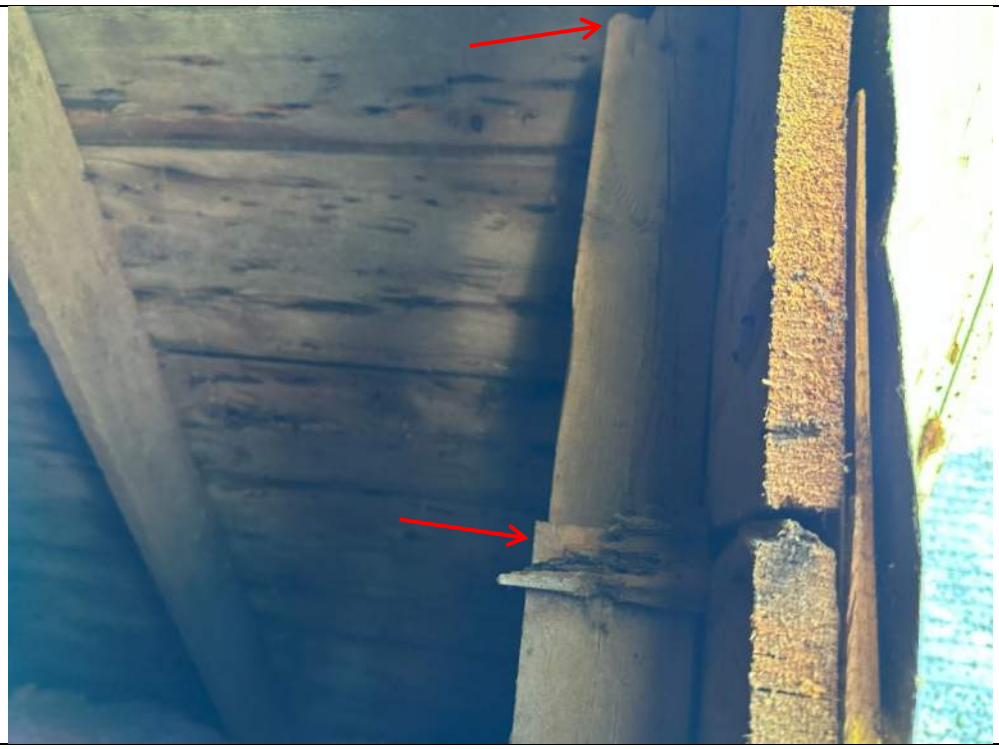
Photograph 3 – Close-up view of deteriorated cladding and bottom plate atop a stone pier.



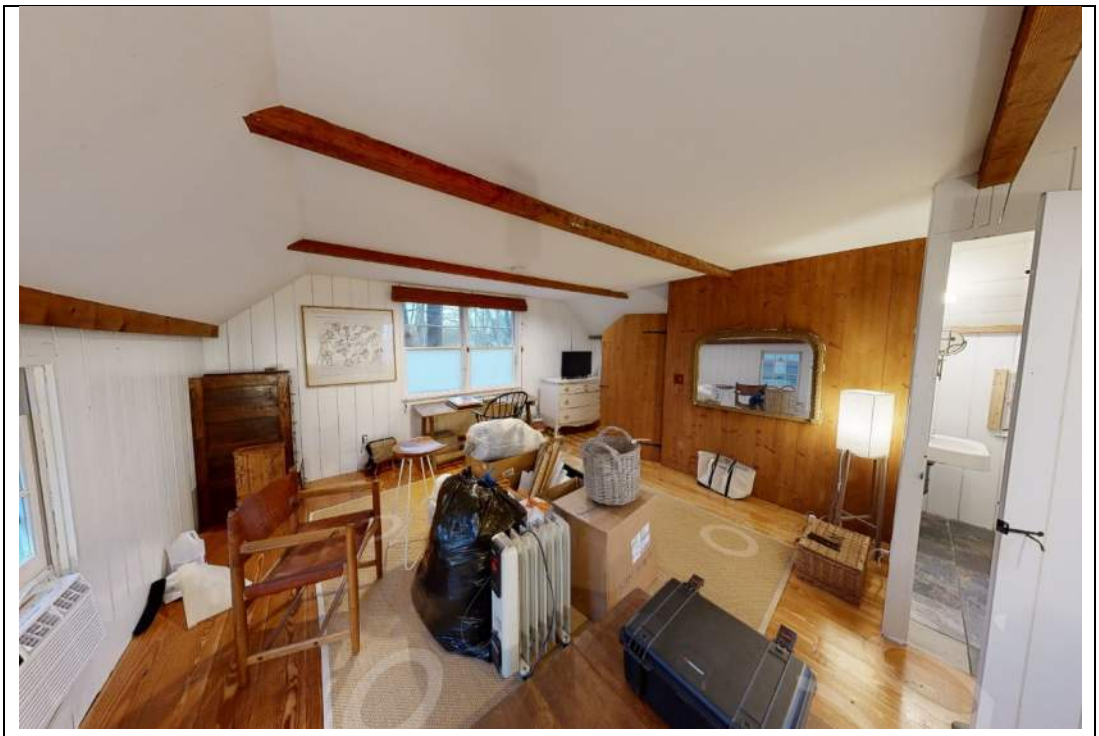
Photograph 4 – View of roof framing looking south. Note deteriorated boards, extensive staining, split at end with exposed corroded nail.



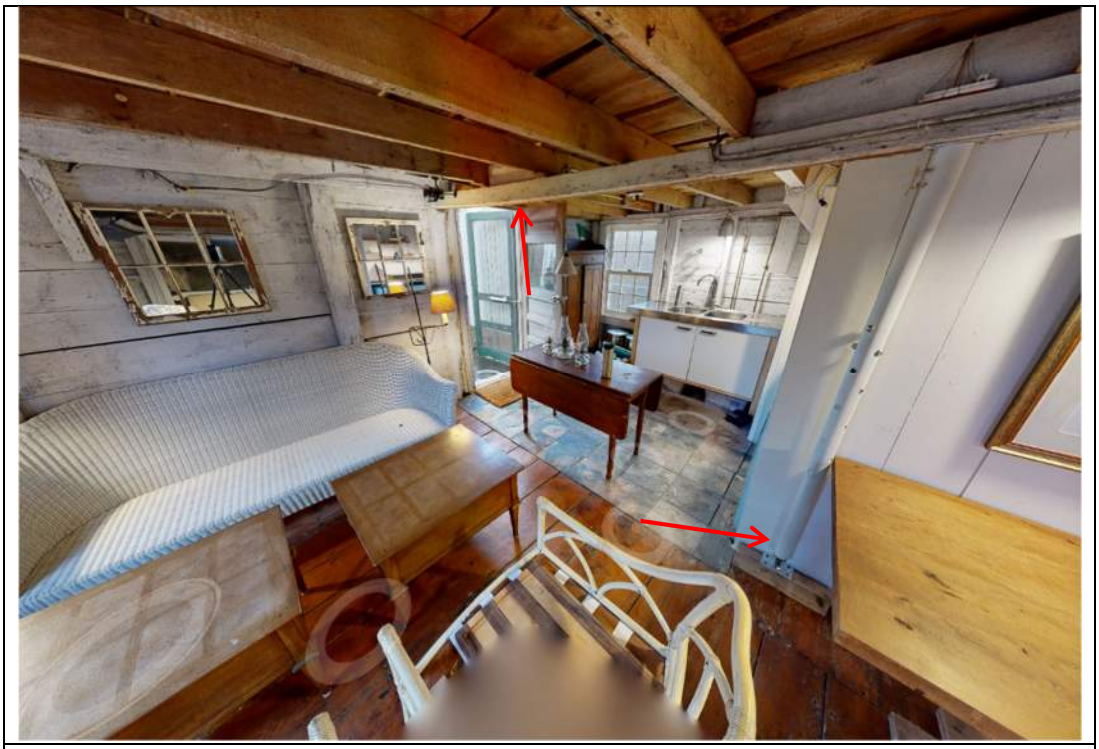
Photograph 5 – Close-up view of north wall boards and deteriorated roof boards (beyond).



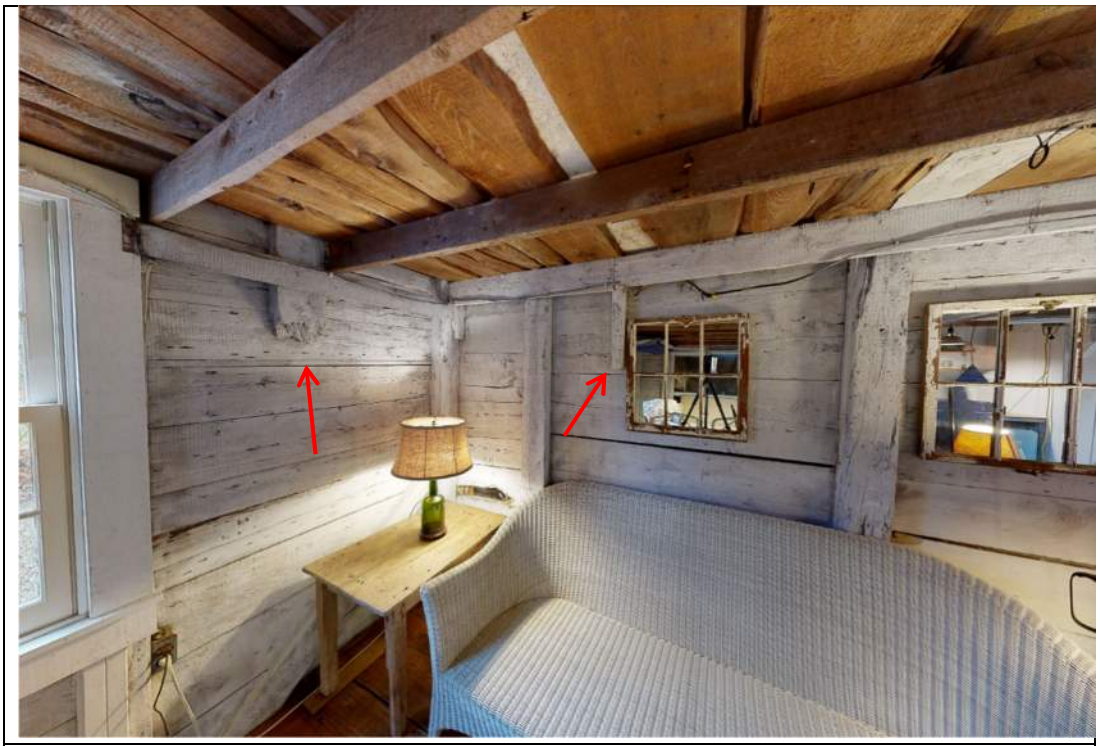
Photograph 6 – View of north gable end wall stud, note deterioration at connections.



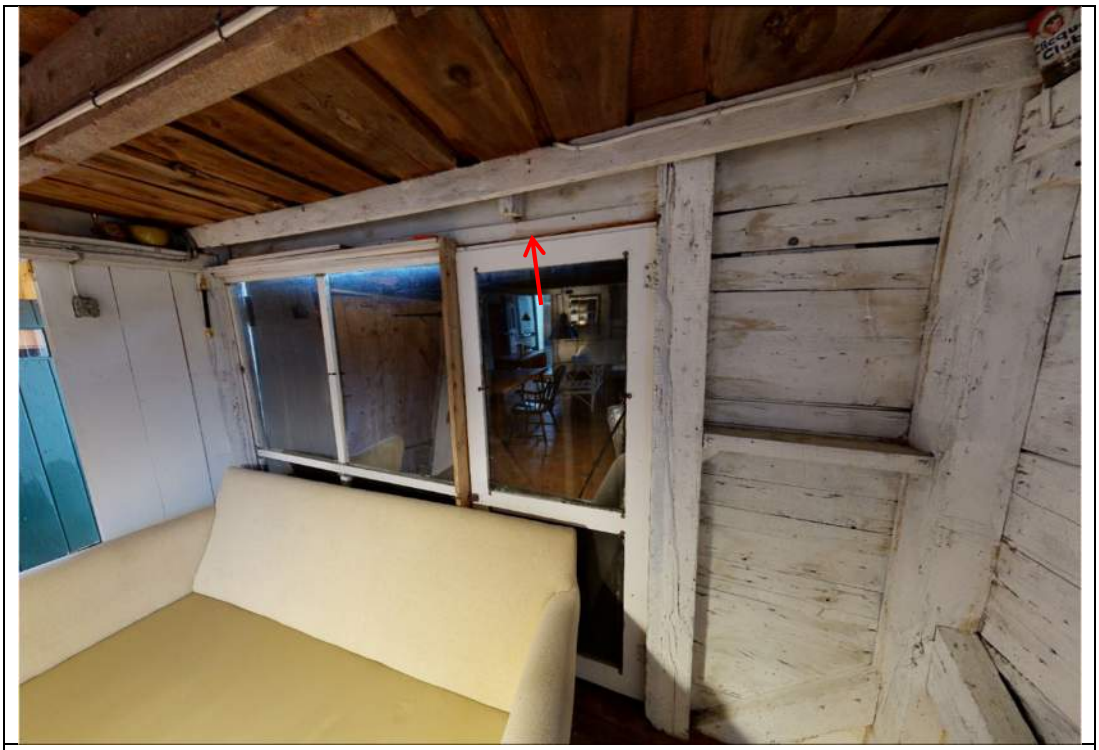
Photograph 7 – View of second floor.



Photograph 8 – View of first floor looking northeast. Note added temporary screw jack column at center beam, and deflection of center beam.



Photograph 9 – View of first floor looking northwest. Note added spacing of posts and 2nd floor posts that terminate halfway between floors.



Photograph 10 – View of first floor looking at south door opening. Note lack of header above door.