GENERAL ASSESSMENT REPORT

FOR THE

EXISTING STRUCTURAL SYSTEMS

AND

FEASIBILITY STUDY FOR POSSIBLE RESTORATION AND/OR RELOCATION

OF

EXISTING LOG CABIN
8128 COLLINS AVENUE
MIAMI BEACH, FLORIDA

SEPTEMBER 1, 2017

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DOUGLAS WOOD ASSOCIATES, INC.
STRUCTURAL ENGINEERS

September 1, 2017

INTRODUCTION

General
As requested by the City, we have conducted a general assessment of the present conditions of the existing primary structural systems for the existing log cabin located at 8128 Collins Avenue in Miami Beach, Florida.

We have also considered the feasibility of restoration and relocation of the existing building.

Purpose
The purpose of this investigation was to provide a general assessment of the present conditions of the existing primary structural systems at this point in time and to provide a general determination of how these conditions may relate to future repair, renovation and restoration. The feasibility of relocating the building has also been considered.

Scope
This investigation includes the primary structural systems for this existing building.

Primary structural systems for this building generally consist of the following:

- Roof sheathing and roof framing,
- Floor sheathing and floor framing,
- Bearing walls (logs), columns and beams, and
- Foundations.

Primary structural systems do not include roofing or other waterproofing systems, doors, windows, decorative elements, fixtures, non-bearing partitions, and architectural finishes. While conducting our structural observations, however, we may have observed conditions relative to some of these systems or observed conditions in these elements that relate to structural systems, and we may report them herein for the benefit of the City.

Roofing, insect infestations (including termites and other wood-destroying insects), mechanical, plumbing and electrical systems, environmental issues (including radon, mold and ground contamination) and hazardous materials (including lead paint and asbestos) are not included in the scope of this structural assessment. If the City desires information relative to these items, the City will need to hire appropriate professionals and technicians.

METHODOLOGY AND LIMITATIONS

Our investigation of the existing conditions was primarily conducted as follows:

- Visual Observations
    - Where architectural finishes remain in place structural members and connections are concealed, and direct observation of structural materials was limited. Since no asbestos report was made available to us, we did not disturb existing materials which might contain asbestos.

    - Where structural members were not or could not be directly observed, a sampling of members was observed, or observations were directed at secondary signs of structural distress such as cracking, bulging, staining and deflections. Also, due to the constraint of time, investigations did not include an exhaustive member by member inspection. Therefore, it must be recognized that at future times, deteriorated or distressed structural components that were not directly observed or specifically reported during this investigation, may be found.

      If must be noted that this building is very old. The Miami-Dade County Property Appraiser indicates that this building was constructed in 1934. Construction practices at the times of the original construction and of subsequent modifications vary considerably from those of today. This is particularly true for the design of wind resistance, but is also true relative to gravity loads. Therefore, there are many aspects of the existing structural systems which do not conform to today's standards, practices and codes.

- Limited "sounding" of existing concrete members (stemwalls)
    - "Sounding" consists of tapping the surfaces of existing concrete members using a small steel hammer. Areas which respond with a hollow or dull sound indicate areas of spalled or otherwise deteriorated concrete or masonry.

- Limited probing of wood members
    - Sample locations along several wood members were probed with an awl or a sharp screw driver to determine a general degree of deterioration of the wood members in the sample locations.

- Exploration
    - As requested by Douglas Wood Associates, City personnel cut openings through the existing floor boards in three locations so that the existing floor framing and stemwalls/footings could be observed. The three locations are:

        1) Southwest corner of central room (original dining/living room),

2) Inside south side closet of southwest room (original bedroom) (Refer to Photograph No. 1), and
3) North side (back side) of existing fireplace (in existing restroom) (Refer to Photograph No. 2).

- Also, as requested by Douglas Wood Associates, City personnel excavated the soil outside the southwest corner of the cabin (Refer to Photograph No. 3) to reveal the existing concrete stemwall).

Calculations have not been performed to verify the adequacy of the original design and construction of the existing structural systems for this building. Douglas Wood Associates assumes no responsibility for the structural design or construction of this existing building at this time. The findings presented in this report do not imply any warranty on the performance or Building Code conformance of the existing structural systems.

In the absence of observations to the contrary, we have assumed that the existing structural systems were properly designed, permitted, constructed and approved in accordance with the building code and general design and construction practices in effect at the time of construction. Also, while we performed observations of the existing structural systems, our observations were limited by time constraints and to what could be readily observed in the existing building.

No sampling and testing of existing materials (except as noted above) were conducted for this investigation.

GENERAL DISCUSSION

In general, this building could be considered to have withstood the "test of time" and therefore, to have structural systems that were generally considered adequate for their intended purposes. However, it must be recognized that the standards, methods, products and practices of the time this building and subsequent modifications were made vary considerably from those of today. Therefore, there are many aspects of the existing structural systems which do not conform to today's standards, practices and codes. It should also be noted, however (as will be indicated in this report), that there are numerous areas of significant structural deterioration.

It also should be recognized that standards of structural engineering practice for older, buildings were far lower than those of today. A structure such as this one would not have been designed by an engineer. Resistance to design gravity loads, live-load deflection and high wind forces in older buildings are almost always deficient relative to current standards. While this building may have survived hurricane force winds, it should be noted that the effects of wind on a building may vary greatly depending on wind direction and wind exposure (which, as a function of the building's surroundings, can substantially change over time). Of course, structural deterioration is also progressive. Therefore, a building's performance in one hurricane may be very different than its performance in another hurricane.

EXISTING SITE CONDITIONS RELATIVE TO STRUCTURAL ISSUES

Environmental Influences

Hurricanes

All of South Florida is vulnerable to hurricanes, and most all older buildings in South Florida, including this building, have been subjected to hurricane-force winds. Past performance, however, cannot be considered a reliable predictor of future performance. Obviously of course, deterioration is progressive, and structural systems may weaken over time. Wind direction and the effects of surrounding trees and construction are also significant factors.

Flooding

Floods are possible in most of the coastal regions of South Florida. According to Miami-Dade County's website, this building is located within a FEMA AE-8 flood zone, which places the Base Flood Elevation (B.F.E.) at +8.0 ft. N.G.V.D. Current FEMA and Miami-Dade County requirements put the Design Flood Elevation (D.F.E.) at B.F.E. plus 1.0 ft = 9.0 ft. N.G.V.D. Current City of Miami Beach policy for City-owned buildings is even higher (up to B.F.E. plus 3.0 ft = 11.0 ft. N.G.V.D.). At this time, information relative to the elevation of the existing floor has not been provided. Therefore, we do not know the existing floor elevation relative to these B.F.E./D.F.E. elevations.

General Building Code Issues Relative to Future Repair, Renovation and Additions

For this discussion, we refer to the Florida Building Code, 2017 and the Florida Building Code – Existing Building, 2017 (the 2017, 6th Edition, is presently scheduled to be effective on December 31, 2017). Of course, it is possible that future Building Code editions may contain changes applicable to future repairs, renovations and additions of this building, but we cannot speculate on such future changes.

At this time, the Building Code will generally allow straight forward minor repairs to structural members, without requirement for a specific investigation of the adequacy of the existing members.

Any future renovations with a work area of less than 50% of the total floor area would be classified as an Alteration Level 2. "Work Area" is generally defined as reconfiguration of spaces. In any case, however, any change to a structural member would require compliance with current Building Code requirements for that particular member and for any affected members.

If it were determined through specific and appropriate investigation and evaluation that a structural member or system were "dangerous" (as defined in Chapter 2 of the Florida Building Code – Existing Building, 2017), it would be required to correct the dangerous condition. Where it is determined that the building as a whole or specific systems have suffered "Substantial Structural Damage" (as defined in the Florida

Building Code 2017 – Existing Building), such damage would need to be corrected and brought into compliance with current Building Code requirements.

When proposed renovations have a work area greater than 50% of the total floor area, a project will be classified as an Alteration Level 3. The Building Official should be consulted where there is any question of interpretation relative to the determination of Alteration Level 2 or Alteration Level 3. Under Alteration Level 3, there are two levels of structural consideration. If less than 30% of the total structural area (floors and roofs) is directly involved in the renovation, structural aspects of the renovation are generally the same as for an Alteration Level 2. The area considered to be directly involved in the renovation is generally calculated to include all areas of roofs and floors undergoing structural alteration plus all areas (not already included) of roofs and floors which are gravity-load-tributary to any vertical structural support members which are altered. When the area of structural alteration exceeds 30% of the total floor and roof area, the project is considered a Substantial Structural Alteration. For such case, it is required that the altered building conform to the current Florida Building Code Requirements for wind loading.

If a change of use for the building were proposed, structural enhancement for current Building Code requirements for wind loads would be required, if the proposed occupancy qualifies as a higher Risk Category as defined in ASCE 7.

If the cost of proposed repair, renovation, restoration, enhancement (and additions, if applicable) exceeds 50% of the current construction cost value of the existing building, it would be necessary for the altered building to be brought into compliance with current FEMA flood design requirements. If a building is officially designated as historical, it is possible to obtain a waiver of flood design requirements.

Section 707.32 of the Florida Building Code – Existing Building 2017 also requires that when a building is reroofed, the connections of the roof sheathing and roof framing members be brought into compliance with current Building Code requirements.

Proposed additions would need to comply with Chapter 11 of the Florida Building Code – Existing Building.

Due to the extent of deterioration and collapse in this building, it appears that any future renovation would be classified as correction of Substantial Structural Damage and as a Substantial Structural Alteration under Alteration Level 3. Therefore, structural systems will need to be made to comply with current Building Code requirements for strength and performance.

GENERAL BUILDING CONFIGURATION

This building was originally constructed as a one-story residence. The overall configuration appears to remain generally as originally constructed (Refer to Photograph No. 4 through 8). A rear porch with flat roof and concrete floor slab appears to be an addition (Refer to Photograph No. 4).

The interior layout of the building also remains mostly as originally constructed with a central living/dining room, two bedrooms and a bathroom to the south side and a bedroom, bathroom and kitchen to the north side.

GENERAL DESCRIPTION OF EXISTING STRUCTURAL SYSTEMS BY BUILDING SECTION

Roof

The main roof has a hip configuration (Refer to Photographs Nos. 4 through 8) with an added flat-roofed rear porch roof.

The roof structure over the northern and southern rooms consists of plywood (not original) over spaced wood boards on wood rafters (Refer to Photographs Nos. 9 through 14). There are horizontal wood ceiling joists which bear on the exterior walls and on interior partitions. These joists generally span east-west and are not generally aligned with the roof rafters.

The exposed exterior eave rafters are small-diameter logs, and at the north and south areas, they are cantilevered from the main roof rafters (Refer to Photographs Nos. 12 and 15).

The roof over the center portion of the building (original living/dining room) was constructed with exposed wood log rafters, braces and bridging (Refer to Photographs Nos. 16 and 17).

The roof over the front porch is not presently accessible.

The rear porch roof appears to be an addition. It is constructed of plywood sheathing, wood rafters and wood beam (Refer to Photographs Nos. 4, 18, 19 and 20).

Bearing Walls

The primary structural bearing walls are the exterior wood log walls. These walls bear on the exterior concrete stemwalls.

There are also interior log walls along the north and south sides of the central living/dining room (Refer to Photograph No. 21). These walls provide some support for the roof and ceilings. These walls bear on wood beams, which bear on the concrete stemwalls and on concrete piers. These interior log walls interlock with the east and west exterior log walls, and their log ends are exposed on the exterior (Refer to Photographs Nos. 4, 7, 22 and 23).

The interior partitions (other than the interior log walls) are wood-framed, and they support the ceilings. These partitions bear on the floor framing.

Columns

The northeast and southwest corners of the front porch roof are supported on cylindrical concrete columns (Refer to Photographs Nos. 7, 8 and 24). We assume that these columns were originally wood logs and that concrete columns were substituted at some later time.

The wood beam at the west edge of the rear porch roof is supported on steel pipe columns.

Fireplace/Chimney

The fireplace and its chimney are constructed of oolitic limestone rubble (refer to Photographs Nos. 8 and 25). Below the floor, however, the stemwalls below the fireplace are constructed of concrete block (Refer to Photograph No. 26).

Floors

The interior floors consist of a single layer of wood flooring (no subfloor/sheathing) on wood joists (Refer to Photographs Nos. 1, 27, 28 and 29). The joists span in the north-south direction. The joists bear on top of the concrete stemwalls (set in notches in the lowest log) (Refer to Photograph No. 28), and they bear on interior wood beams (Refer to Photograph No. 27). The beams bear in pockets in the concrete stemwalls (Refer to Photograph No. 27) and on interior concrete piers, formed using 50-gallon steel drums (Refer to Photographs Nos. 27 and 29). The interior log walls (north and south sides of central room) bear on the floor joists above the beams (Refer to Photograph No. 30).

The floors of the front and rear porches are concrete slabs-on-ground.

Foundations

The primary foundations consist of concrete stemwalls founded on continuous concrete wall footings under the perimeter log bearing walls (Refer to Photograph No. 27). The depth of the footing varies somewhat (i.e., it is sloped).

The steel pipe columns at the rear porch bear on the edge of the concrete floor slab (Refer to Photograph No. 31).

If there are footings for the front porch columns, they are buried and were not observed.

GENERAL ASSESSMENT OF PRESENT CONDITION OF EXISTING STRUCTURAL SYSTEMS

Specific Areas of Noted Significant Structural Deterioration or Damage

Roof

1) In general, with some exceptions, most of the interior roof framing members appear to be in fair to good condition. Many of the exterior roof members, however, have noticeable deterioration and/or damage.

2) Many of the exposed small-diameter log eave rafters have significant amounts or rot, insect damage or both (Refer to Photographs Nos. 32, 33 and 34). Many of these eave rafters appear to butt against the fascia. We assume that these eave rafters have been replaced at some time. Continuity with the interior rafters is not apparent at this time. Without continuity, they do not support the eave.

3) Numerous locations of the eave sheathing boards exhibit insect damage (Refer to Photograph No. 32).

4) There is significant insect damage and/or rot in the rafters and beam of the rear porch (Refer to Photographs Nos. 18, 19, 20, 35 and 36).

5) There are a few areas of rotted plywood sheathing in the roof of the rear porch (Refer to Photograph No. 20).

6) There is a yellow covering in the lower length of the southeast hip ridge board (Refer to Photographs Nos. 9 and 37). This appears that it may be a fungus.

Log Walls

1) The entire north wall (Refer to Photograph No. 8) and approximately 2 to 3 foot returns at the east and west walls appear to be constructed of pressure-treated logs. It appears that these areas were entirely reconstructed at some point in time. Where the replacement logs meet the original logs in the east and west walls, the logs are butted to each other (often with mortar or chinking to fill and seal the joints) (Refer to Photographs Nos. 38 and 39). The lack of continuity in these logs results in a lack of structural capacity relative to lateral wind pressures.

2) The later pressure-treated logs exhibit weathering, splitting and some areas of minor rot.

3) The uppermost log in the north (replaced) wall, was installed in segments (rather than continuous). Again, this arrangement lacks structural capacity relative to wind pressures.

4) While the interior surfaces of the logs remain in fair to good condition, the exterior portions of the original logs are significantly deteriorated. Deteriorated conditions

include rot (slight to severe), splitting and delamination of rings (Refer to Photographs Nos. 40 through 59). In many locations, these conditions penetrate deep into the logs.

5) Many of the logs have been previously patched with mortar (Refer to Photographs Nos. 48, 49, 61, 62, 63 and 64). Some logs have been patched with inserts of dimension lumber and mortar. These are inappropriate patches. Many of these patches are now failing due to progressive deterioration and rot.

6) The chinking between logs in the exterior walls is in generally poor condition. This is particularly true of the exterior sides, but also extends to the interior sides in many locations.

Chimney

1) The chimney and fireplace appear to be unreinforced masonry.

Porch Columns

1) The concrete slab at the northern pipe column of the rear porch is cracked (Refer to Photograph No. 31).

Floor

1) Some of the floor sheathing and joist segments under the north side restroom (north side of fireplace) have been replaced. The joist splices do not appear to be adequate (Refer to Photograph No. 60).

2) There are no provisions for ventilation of the crawl space. Ventilation is a Building Code requirement.

3) Where the floor joists bear on the exterior concrete stemwalls, most only bear approximately 1-½“ to 2” on to the wall. This is generally an inadequate bearing length. The wood members bear directly on the concrete. In many locations, the joists were set on shims at the stemwall. Many of these shims are loose or have already fallen.

4) Where the floor beams bear on the interior concrete piers, they are generally set on unsecured wood blocks or shims (Refer to Photograph No. 29).

Foundations

There are long, generally horizontal cracks at the tops of the concrete stemwalls in some locations (Refer to Photographs Nos. 65 and 66). These cracks may be the result of spalling from corroded reinforcement. Additional investigation would be required to better determine the cause and prognosis of this condition.

Areas of General Structural Deficiency

1. In addition to the areas of deterioration, damage and collapse noted above, there are a number of additional issues of general structural deficiency.

2. Generally, the wood structural systems should be considered to be structurally inadequate. This is true for roofs, walls and floors. Where members remain in serviceable condition, enhancements would be required.

3. The hip ridge boards are long 2x6's. One must assume that they are supported by the geometry of the roof planes and by lateral resistance at the tops of the log walls. Each of these ridge boards is also supported by one 2x4 stud in the partition above the interior log walls (Refer to Photograph No. 13). In our opinion, this configuration and the associated members and connections are of questionable capacity.

4. The free ends of logs at window and door openings lack resistance to lateral wind pressures.

5. As is the case for almost all old buildings, connections and general continuity are deficient relative to wind uplift.

6. At this time, it is assumed that the floor is below the current FEMA Design Flood Elevation.

7. There are no provisions for equalization of flood waters between inside and outside of the crawl space.

CONCLUSIONS AND RECOMMENDATIONS

1) As described in the preceding portions of this report, there are many concerns relative to general structural deficiency.

2) There is significant deterioration and damage to the existing structural systems, particularly the exterior eaves and walls.

3) The entire north side wall and 2 to 3 foot returns of the east and west walls were entirely reconstructed at some time.

4) There are many areas of inappropriate previous patching and replacement.

5) There are issues related to Building Code requirements (Alteration Level, Substantial Damage and Substantial Structural Alteration and reroofing).

6) There are also issues related to compliance with FEMA flood design requirements.

Of course, the issues encountered above are not uncommon for old buildings.

Disregarding the issue of construction cost for the moment, in our opinion, the general feasibility of restoring this building is determined by the present conditions of the exterior log walls.

1) As previously stated, the entire north wall and returns at the east and west walls have already been reconstructed. Therefore, these areas of the exterior walls do not contain any original material (except two windows).

2) There are many areas of inappropriate exterior patching.

3) The entire exterior has been painted.

4) The exterior portions of the log walls and eave rafters are significantly and extensively deteriorated.

In our opinion, most of the logs in the exterior walls would need to be replaced. Due to the extent of deterioration, it does not appear to be reasonably feasible to repair the exterior logs. Epoxy products intended for wood repair could be considered, but again, the general extent of repairs, the depth of repairs and the volume of repair appear to be too great. Even if such repair materials were used for portions of the exterior logs, the repair areas would, of course, lack the color, texture and grain of the wood. The exterior would need to be completely repainted. The paint and lack of texture in the patches would likely by esthetically unacceptable for a “historical” restoration. Given these conditions and limitations, it is our opinion that the exterior log walls need to be reconstructed using new materials.

Other existing structural materials for roof framing, floor framing and interior partition framing could be salvaged and reinstalled into the reconstructed building where such materials are determined to be in serviceable condition. As previously discussed, however, significant structural enhancement to these systems will be required due to Building Code requirements for reroofing, Substantial Damage and Substantial Structural Alteration.

Enhancement of the floor structures and of the roof structures above the northern and southern rooms can be accomplished in concealed areas (crawl space and attics). The exposed roof framing in the central roof, however, would present a challenge. Further study, analysis and design would, of course, be required. Possible solutions are to sensitively supplement the existing members and connections with additional members and connection devices or to replace the existing embers with larger (stronger and stiffer) members.

Clearly the construction cost for accomplishing an appropriate restoration of the building will exceed 50% of its current construction cost value. This will require compliance with current FEMA flood design requirements. At this time, we do not know the existing floor elevation. Assuming it is below the current Design Flood Elevation, the floor would need to be raised. Also, it is required to provide flood equalization vents for the crawl space. As currently constructed, this is not feasible because the crawl space is entirely below the surrounding grade. Current requirements would require that the stemwalls be extended above grade and that flood vents be added. The ground inside the crawl space would need to be raised to within one foot of the bottoms of the flood vents.

It should be noted that if the building were designated historical, a waiver from compliance with flood design requirements could be obtained.

Our assessment, therefore, indicates that “restoration” of this building is not feasible. The closet one could come to “restoration” would be to reconstruct foundations and stemwalls with new materials (unless historical designation is achieved and flood design requirements waived), reconstruct the exterior log walls with new materials, and reconstruct the floor and roof using existing materials, supplemented with new materials as required.

If there were a delay between dismantling of the existing building and reconstruction, salvaged materials could be stored. Of course, the salvaged materials should be stored indoors. An air-conditioned space would be best. We were also asked to consider the feasibility of relocating this building. Given our conclusions above, however, it does not appear that relocation of the building is appropriate. If a new location is desired, one would simply construct the new foundations, stemwalls and exterior log walls at the new site. Existing roof and floor structures would be dismantled, and salvaged materials transported to the new site.

Although it could be done, it would not be cost effective to reconstruct the log walls at the current location and then relocate the entire building to a new site.

CONSTRUCTION COST ESTIMATE

At this time, it is only possible to consider the probable construction costs on a very preliminary basis. At this time, we will assume that the building will be reconstructed as discussed above and as indicated below.

At this time, we estimate that the probable construction cost will be in the range of $750,000 to $1,000,000. At this time, we estimate that the costs may be breakdown approximately as follows

1)	New foundations and stemwalls	5%
2)	Reconstruct log walls with new materials	15%
3)	Reconstruct floor and roof with new and salvaged materials	15%
4)	Restore interiors	20%
5)	Reroof with wood shakes	5%
6)	Restore or replace (with historically compatible units) existing doors and windows	15%
7)	Accomplish minimal site wok (exterior walkways and ramps, grading, storm drainage, minimal landscaping, minimal exterior lighting)	5%
8)	Completely replace mechanical, electrical and plumbing systems	20%
	Total	100%

PHOTOGRAPH NO. 1

PHOTOGRAPH NO. 2

PHOTOGRAPH NO. 3

PHOTOGRAPH NO. 4

PHOTOGRAPH NO. 5

PHOTOGRAPH NO. 6

PHOTOGRAPH NO. 7

PHOTOGRAPH NO. 8

PHOTOGRAPH NO. 9

PHOTOGRAPH NO. 10

PHOTOGRAPH NO. 11

PHOTOGRAPH NO. 12

PHOTOGRAPH NO. 13

PHOTOGRAPH NO. 14

PHOTOGRAPH NO. 15

PHOTOGRAPH NO. 16

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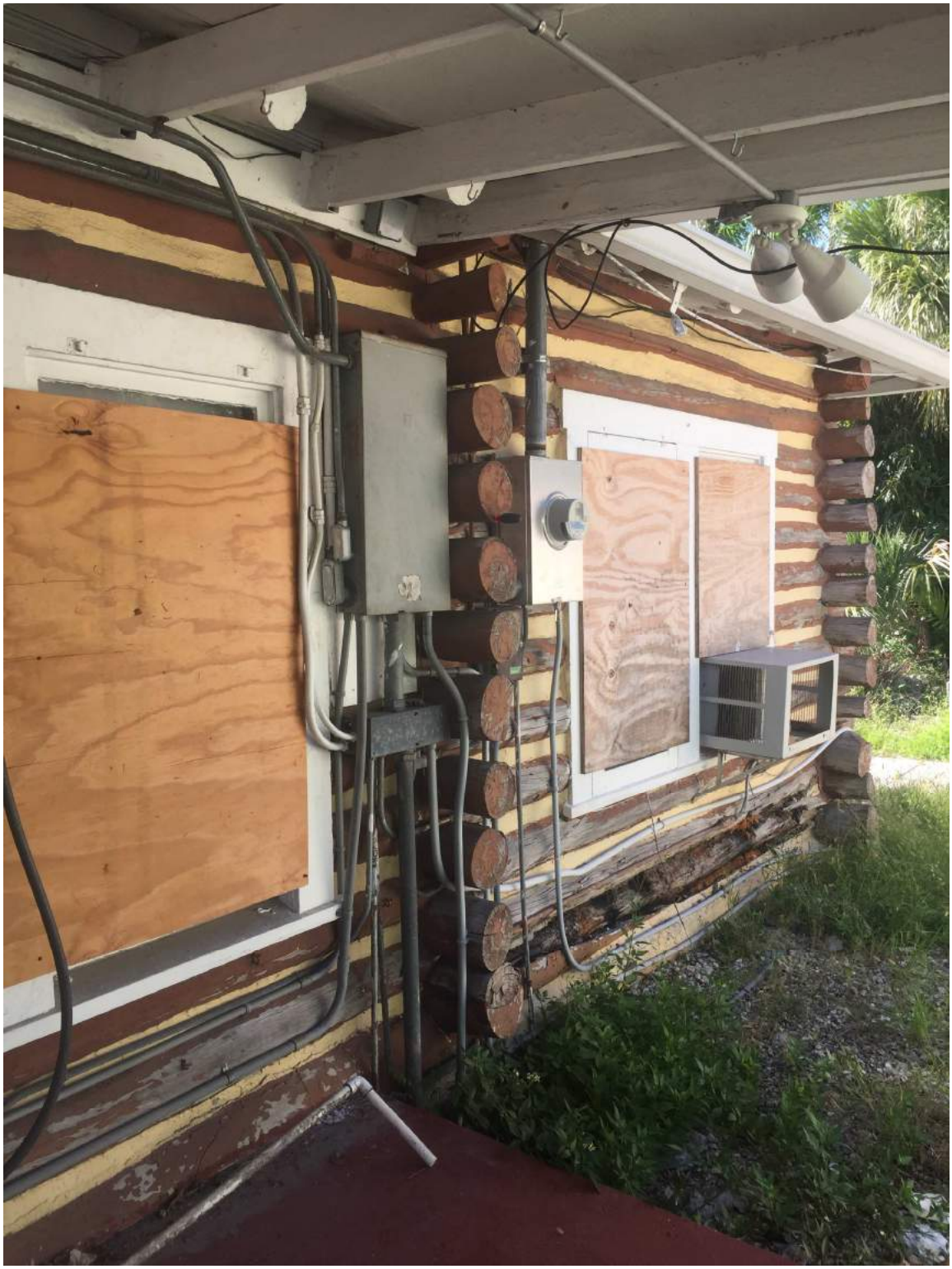
PHOTOGRAPH NO. 18

PHOTOGRAPH NO. 19

PHOTOGRAPH NO. 20

PHOTOGRAPH NO. 21

PHOTOGRAPH NO. 22



PHOTOGRAPH NO. 23

PHOTOGRAPH NO. 24

PHOTOGRAPH NO. 25

PHOTOGRAPH NO. 26

PHOTOGRAPH NO. 27

PHOTOGRAPH NO. 28

PHOTOGRAPH NO. 29

PHOTOGRAPH NO. 30

PHOTOGRAPH NO. 31

PHOTOGRAPH NO. 32

PHOTOGRAPH NO. 33

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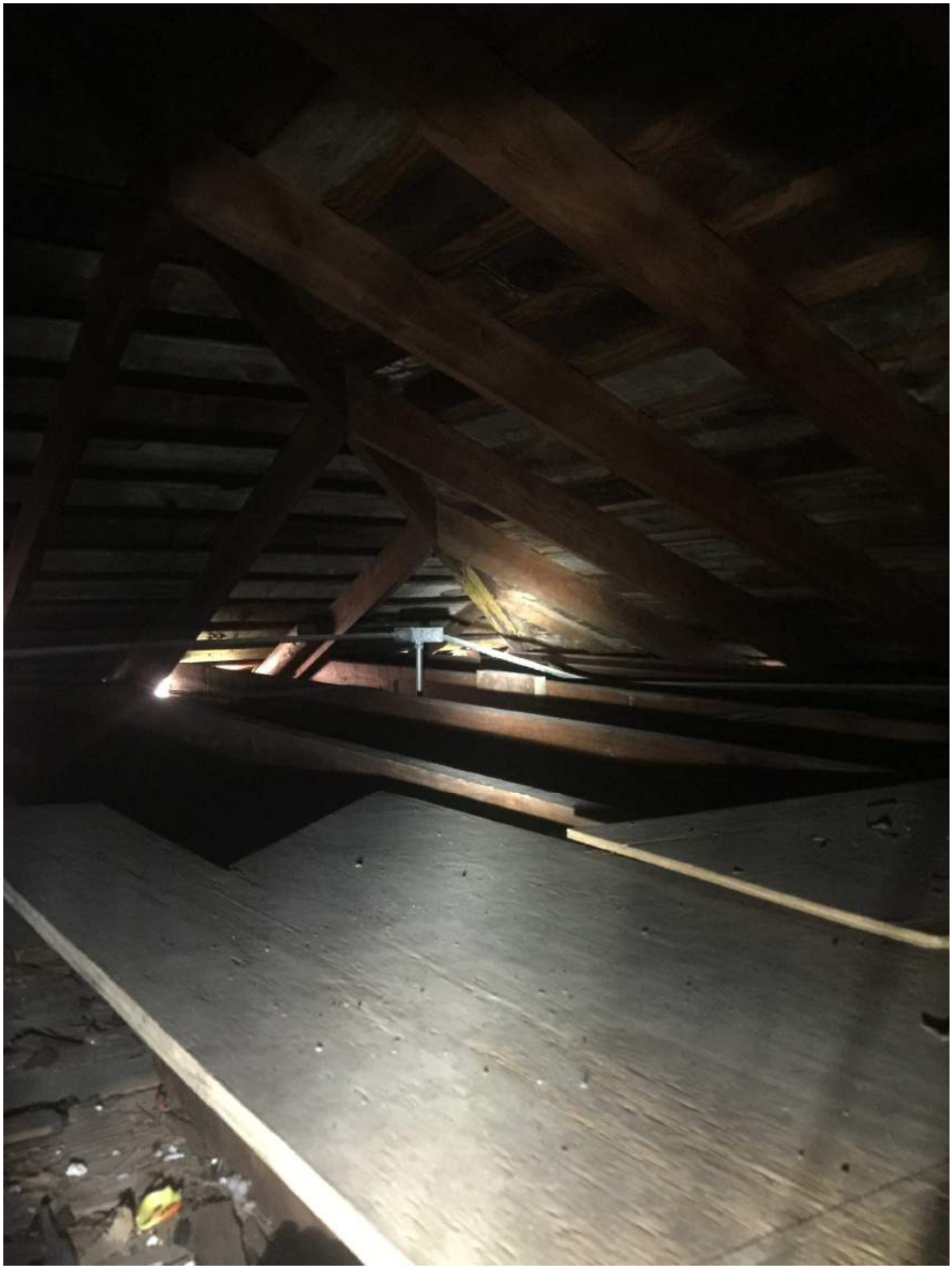
PHOTOGRAPH NO. 36



PHOTOGRAPH NO. 37

PHOTOGRAPH NO. 38

PHOTOGRAPH NO. 39

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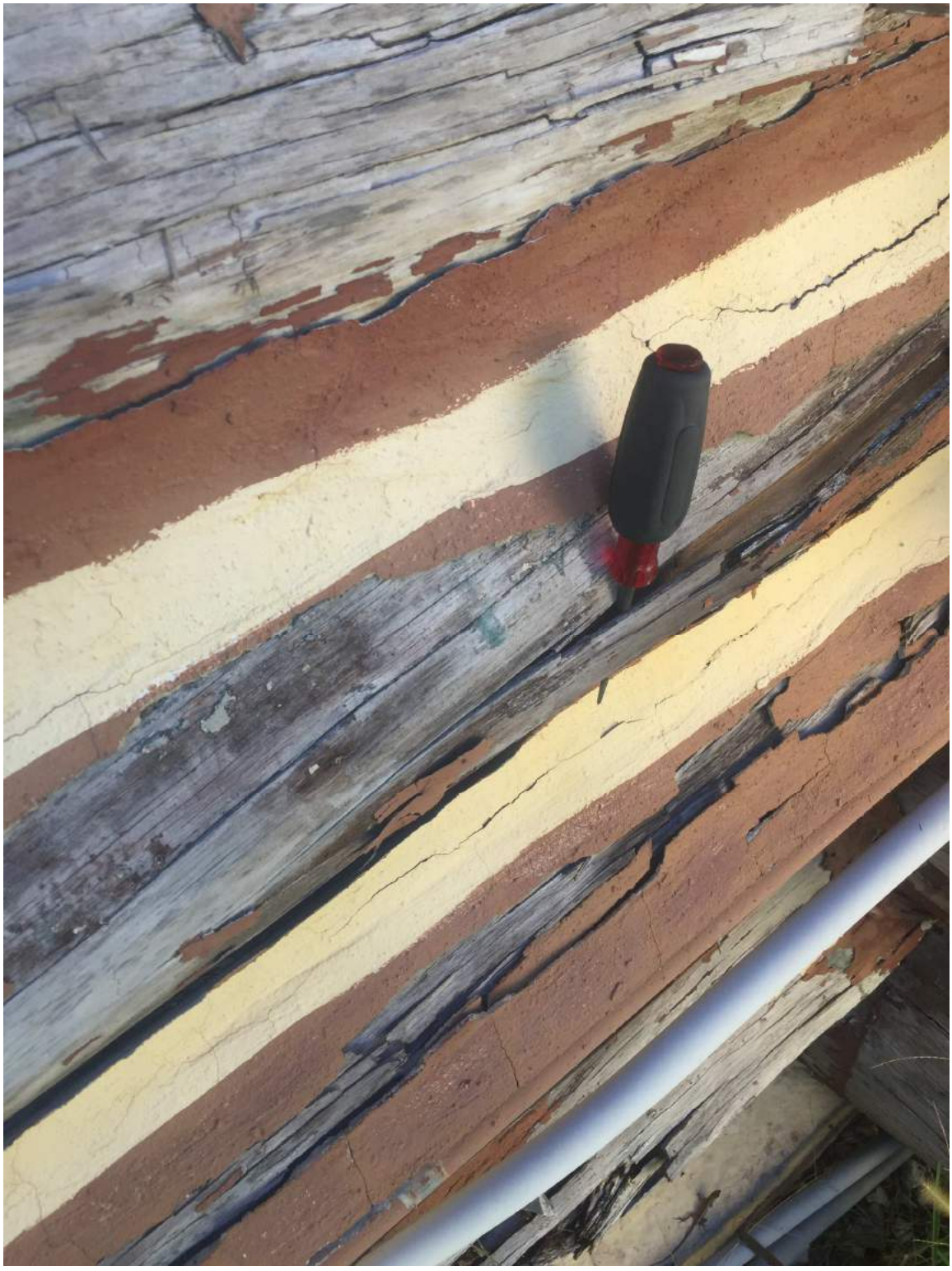
PHOTOGRAPH NO. 45



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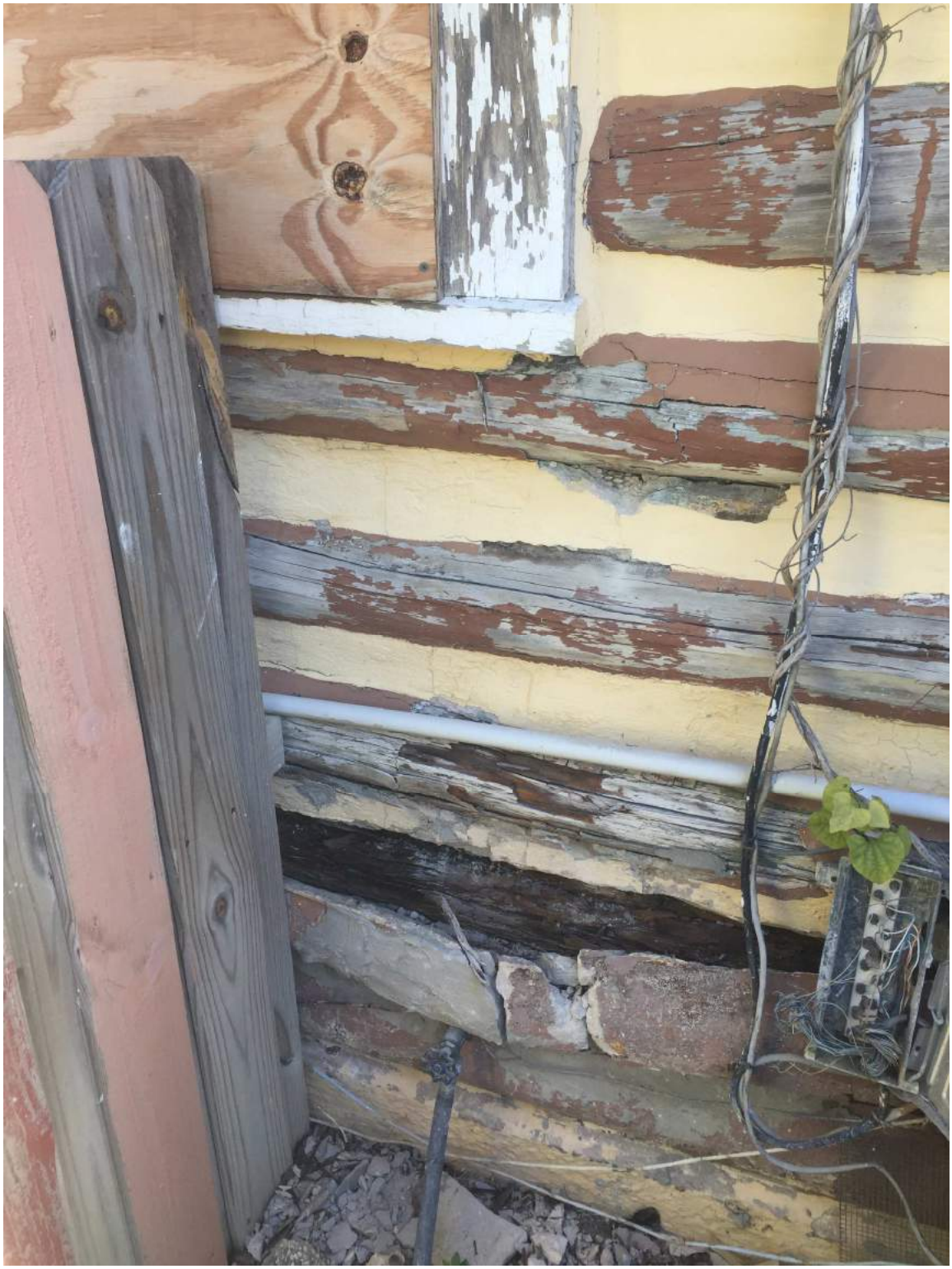
PHOTOGRAPH NO. 47



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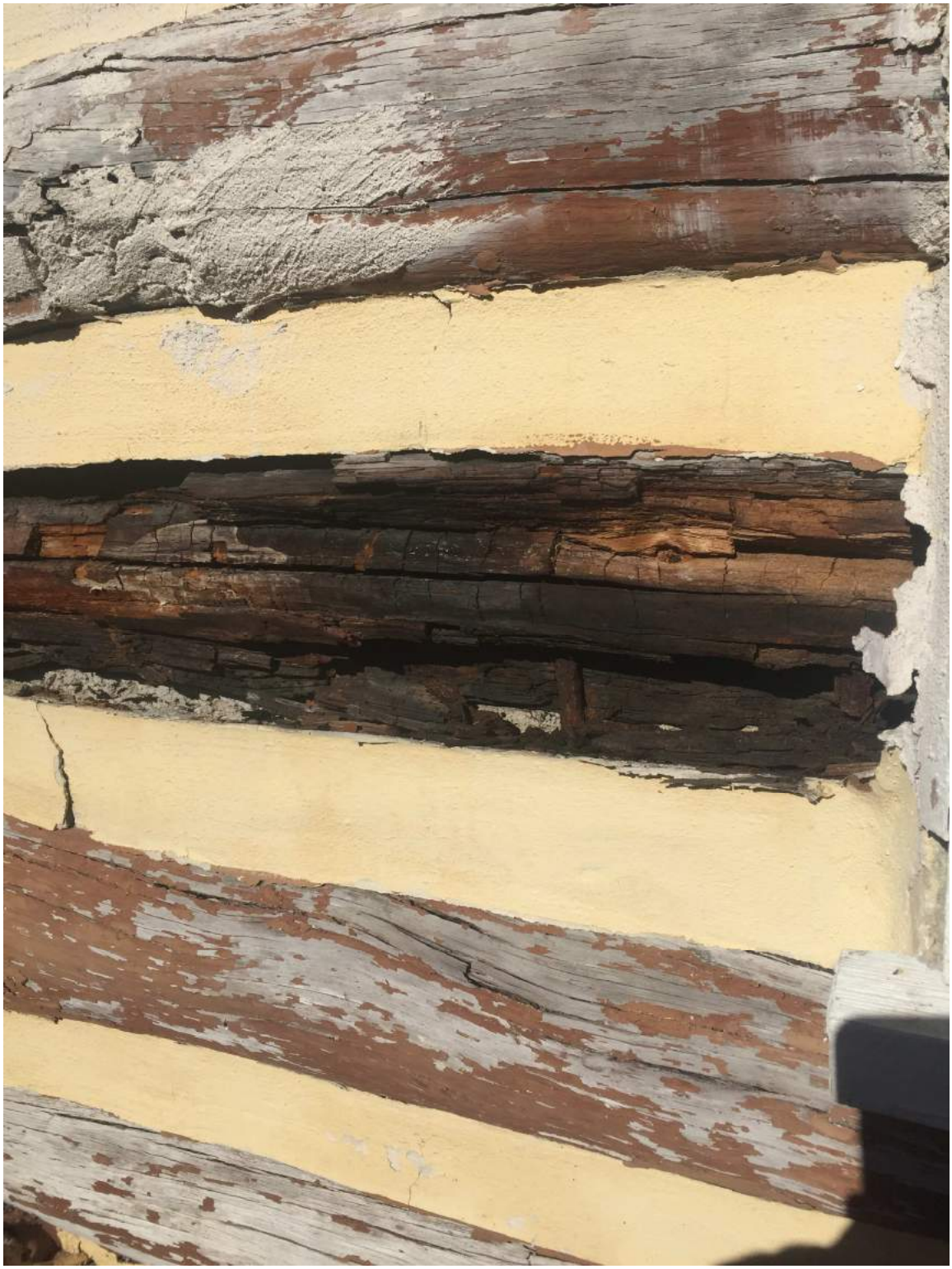
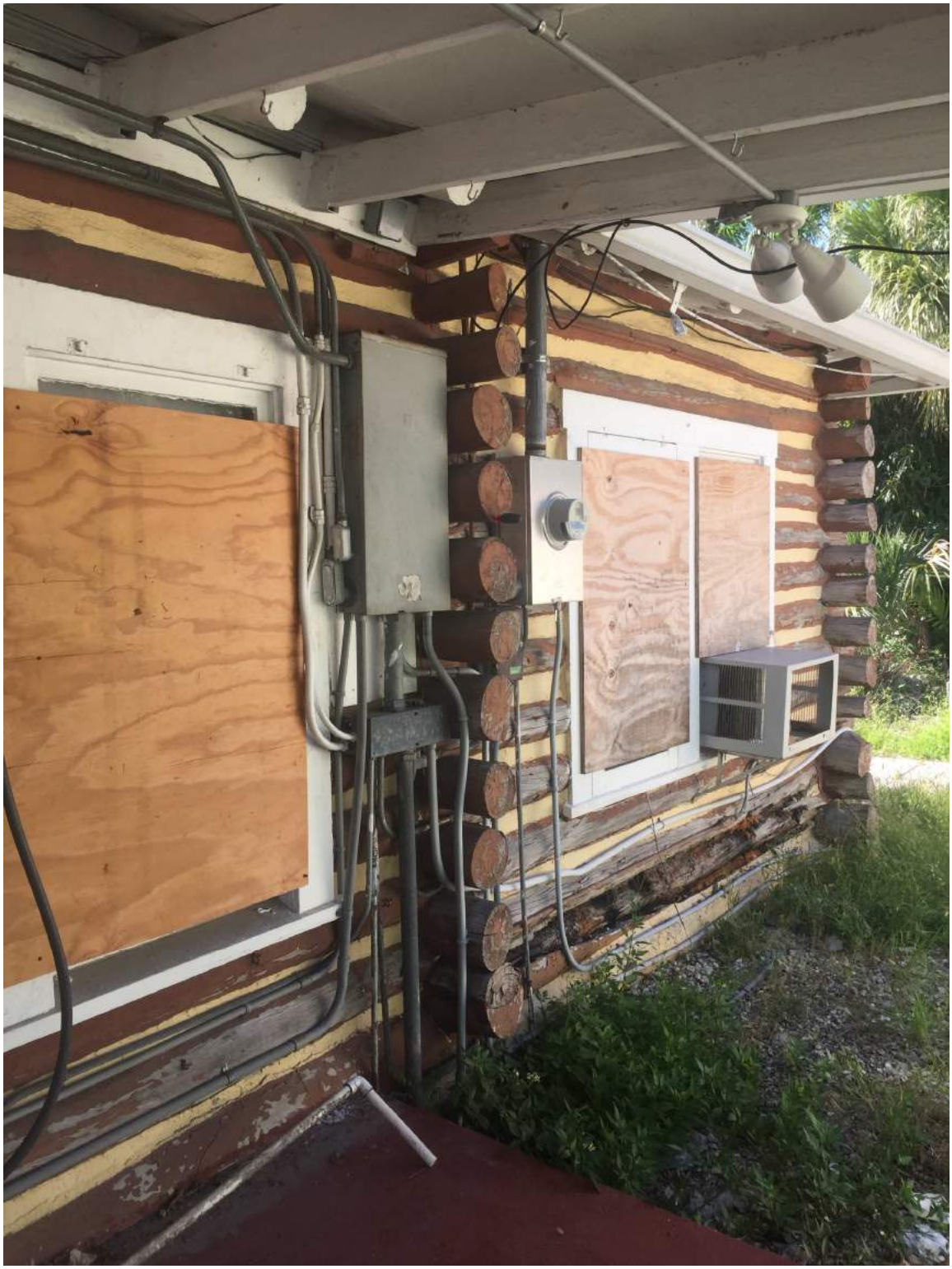


PHOTOGRAPH NO. 49

PHOTOGRAPH NO. 50

PHOTOGRAPH NO. 51



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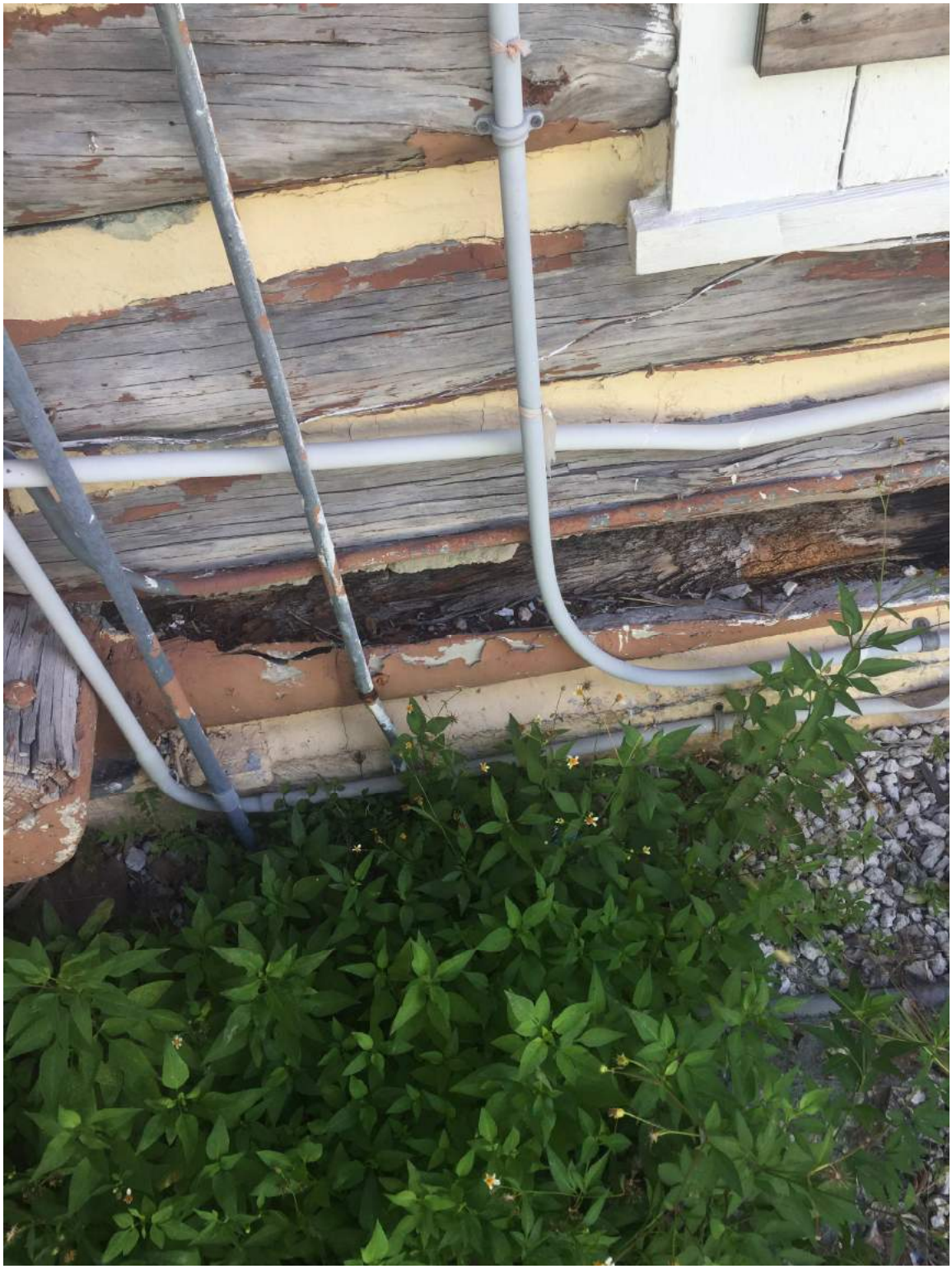

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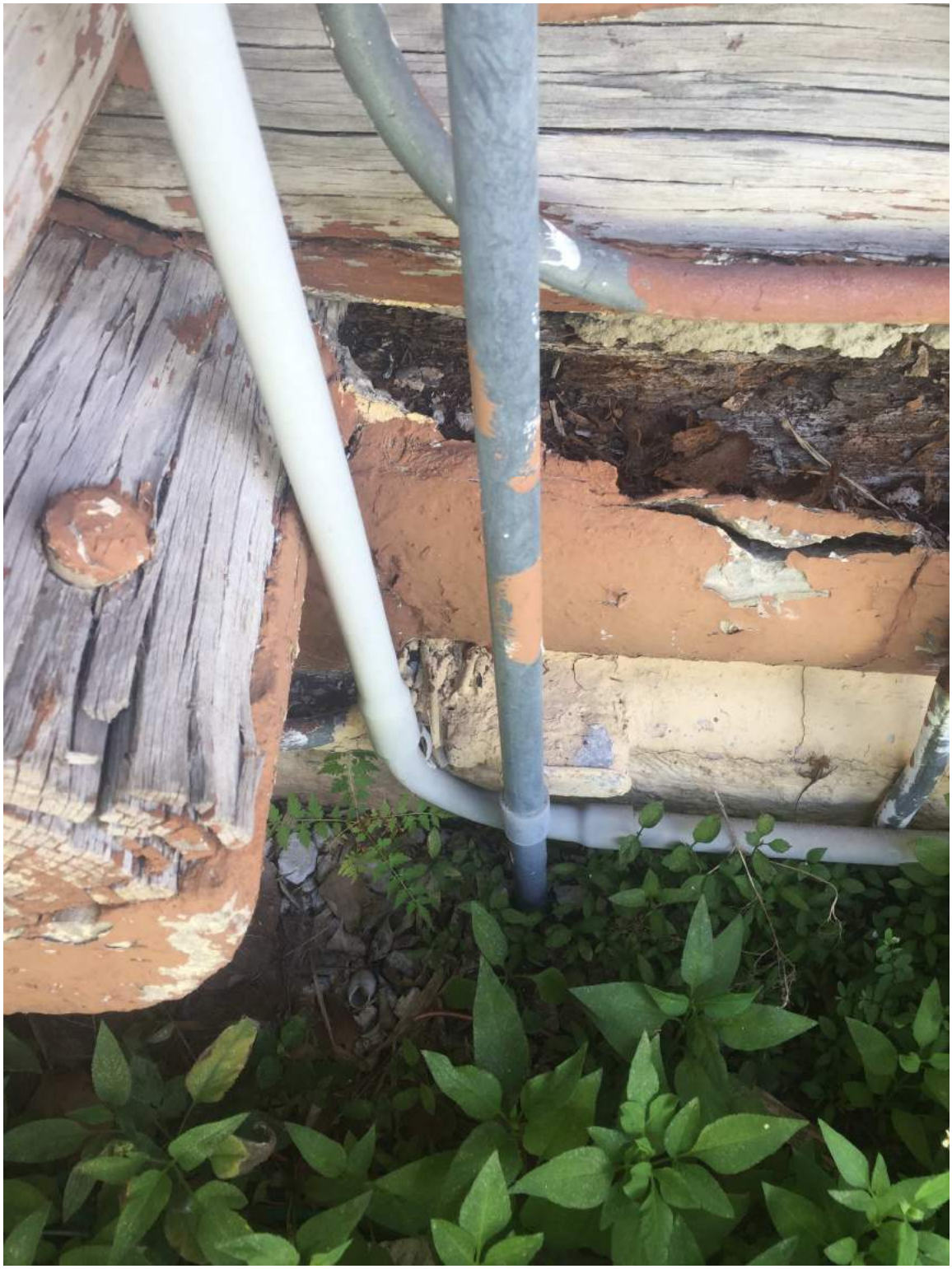

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