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**TO: Dan Seeley – Steve Brown Apartments  
Shane Fry – Brownhouse**

**DATE: November 4, 2013**

**FROM: Kurt Frey, PE**

**SUBJECT: Structural Evaluation Report  
127 W. Gilman St  
Madison, Wisconsin**

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**Pierce Engineers** conducted a site visit on Thursday, October 24, 2013. The purpose of the site visit was to assess the structural integrity of the existing house located on the property. Present on the site at the time of the visit were Mr. Kurt Frey of Pierce Engineers, Mr. Shane Fry of Brownhouse and Mr. Dan Seeley of Steve Brown Apartments.

### **Background**

The site visit conducted was a limited site inspection, and only included a visual inspection of the property. Much of the structure was concealed behind plaster /drywall walls and ceilings, and flooring preventing direct measurements of the structural framing or inspection. Any reference to the structural condition at concealed spaces is based on engineering judgment and speculation as it pertains to exposed structural framing around concealed spaces and noticeable distress to walls and ceilings observed in the area. In addition no structural calculations were made to assess the capacity of the existing structure as it relates to Code required Live Loads and the dead load on the structure.

It is our understanding the house located at 127 W. Gilman was constructed circa 1880's and some subsequent additions and modifications to the original structure were made over time. Dates of the additions and modifications are unknown. The house has three floor levels with a full basement. It was difficult to assess which part of the house was original and what was added as there was no discernible difference from the exterior wall cladding or exposed structure.

## Observations

The following are observations were made during the site visit which has an impact on the integrity and serviceability of the building structural.

1. The existing basement walls were constructed using stone rubble and brick set with mortar. Most of the basement foundation walls are either in a severe state of distress or complete failure has occurred in some areas. Two significant areas to note are:
  - a. Complete failure of the north foundation wall (See Picture 1). It is my understanding this wall has been previously shored once or twice previously and repairs made. It is also my understanding that this shoring and repairs were made prior to the purchase of the property by the current owner. The primary distressed condition related to deteriorated extreme distressed areas primarily consisted of in a state of severe distress and / or failure in some areas.
  - b. Bowing in of a section of wall located along the north foundation wall (Picture 2). At this section of wall the mortar joints have completely disintegrated and you can see thru the wall in some spots. Pictures 3 thru 6 show various sections of the foundation wall where there is significant deterioration / disintegration of the mortar joints.
2. There are several wood posts in the basement which support the first floor beams, and these first floor beams are under bearing walls above. The bearing walls above support the second, third, and attic floor framing. Over time due to moisture, the bases of these columns have rotted. Some have been repaired, but many have not and significant rotting has occurred at the base. This degree of rotting has significantly diminished the structural capacity of the post. Pictures 7 thru 9 show typical rotted base conditions.
3. Much of the first floor framing was concealed to view in the basement, except for the east end on the south side of the house. The floor structure in this area has experienced some distress and deterioration that has compromised the structural capacity of the framing system. In this area floor some floor beams and joists have experienced rotting (Pictures 10 thru 12) and construction connections of the joist to beams (Pictures 11 and 12) are not of good practice and have diminished the structural capacity of the members.
4. The second and third floor framing was mostly concealed to view and assessment of the structural integrity of the framing members could not be made. However, there are areas where the structural integrity may be compromised. These areas are where water leaking has occurred for a significant period of time. The water leaking could lead to rotting of the structure in these areas. Picture 13 and 14 are two such areas where water leaking has occurred for a significant period of time.
5. At some point in time a fire occurred in the attic and second floor bathroom along the north wall. It is our understanding that the fires occurred prior to the current owners purchasing the property. Pictures 15 and

16 are of the attic / roof structure where fire damage has occurred. The fire was of significant intensity that severe charring has occurred to some of the attic / roof framing members reducing their structural capacity. Picture 17 is of the fire damage at the second floor bathroom. The intensity of the this fire does not appear to have been as damaging as the attic fire, but charring of the framing members has occurred, and it is suspected the structural capacity of the charred framing members has been reduced.

6. The house has also experienced some movement and settlement over time. It is believed this movement has not reduced the structural integrity of the framing, but is one of serviceability of the structure. Pictures 18 thru 20 show evidence of building movement. Sloping of the floor framing has also occurred and this is noticeable when walking the floors. This movement has caused diagonal cracking in the walls, Picture 20, which leads to mis-aligned doors and window. Other affects as a result of the movement are buckled flooring and sloped floors.

### **Recommendations**

No quantitative structural analysis has been made for the current structure. However; based on our experience and the observations made, the structural integrity of the house have been compromised in areas requiring remedial repairs prior to any occupancy. Some of it is with large areas, and some of it is in isolated sections. It is suspected that if an in-depth structural analysis were performed, sections of the framing in its deteriorated and distressed condition would not be capable of supporting typical full live load and dead load imposed on the structure. Thus some remedial measures must be taken before any occupancy could be considered. The key findings observed during the inspection that raise concern with the overall structural integrity of the building include:

1. Failed foundation walls; which include complete failure with cave in and bowed in foundation walls
2. Distressed and deteriorated mortar joints of foundation walls. The integrity of the wall solely relies on friction and interlocking of the stones to resist the lateral earth pressure on the wall.
3. Rotted bases of many of the basement wood posts. The structural integrity of the posts is questionable and these posts not only support the first floor framing but the interior bearing walls on the second and third floor framing.

There are two options that can be considered for this structure. One; is to raze the current building. The other is to selectively replace and repair the current structure to ensure the structural integrity. As a minimum the following is needed based on the observation made during the site visit.

1. Complete replacement of the foundation.
2. Removal and replacement; including improving the foundation bearing for the deteriorated wood posts in the basement.

3. Reinforcement or replacement of rotted and compromised framing members (Pictures 11 and 12) at the first floor framing level. It is estimated that the majority of the first floor framing would need to be corrected in some manner by either; removal and replacement of the structure or reinforcement of the existing structure.
4. Replace the fire damaged structure.
5. Further exploration of the structure at the water leaking areas to check for additional structure deterioration due to rotting.

With future development of the property being considered there is another possibility if razing the house is not an option. This would be to move the house to a new location. This has been done successfully with older structures of this nature. We are experienced with assisting contractors with moving houses, but not experts in this area. But based on the current condition of the first floor framing; with the rotting joists, beams, and house rim board along with discontinuity of framing from addition to addition tying the various structures together moving this house would be huge challenge and may likely not be feasible.

The current building structure, under the existing dead loads and limited live loads, is stable. There is no guarantee that under full loads the structure or a change in earth pressure conditions on the foundation walls may result in further distress to the structure or even failure may result. As stated previously, some remediation of the structure is required prior to any occupancy.

Kurt D. Frey, PE

Existing condition observations made and reported within the context of this report were based on a visual inspection only and did not contemplate or involve the dismantling beyond what had already been completed or moving of any objects or portion of the premises. Latent and concealed conditions, defects, and deficiencies are excluded from the scope of our review. Pierce Engineers, Inc. shall have no liability for concealed from view or inaccessible conditions which were not or were not able to be directly observed. Our observations are limited to the conditions as they existed on the date of our observations, the real property and not the review of any personal property.



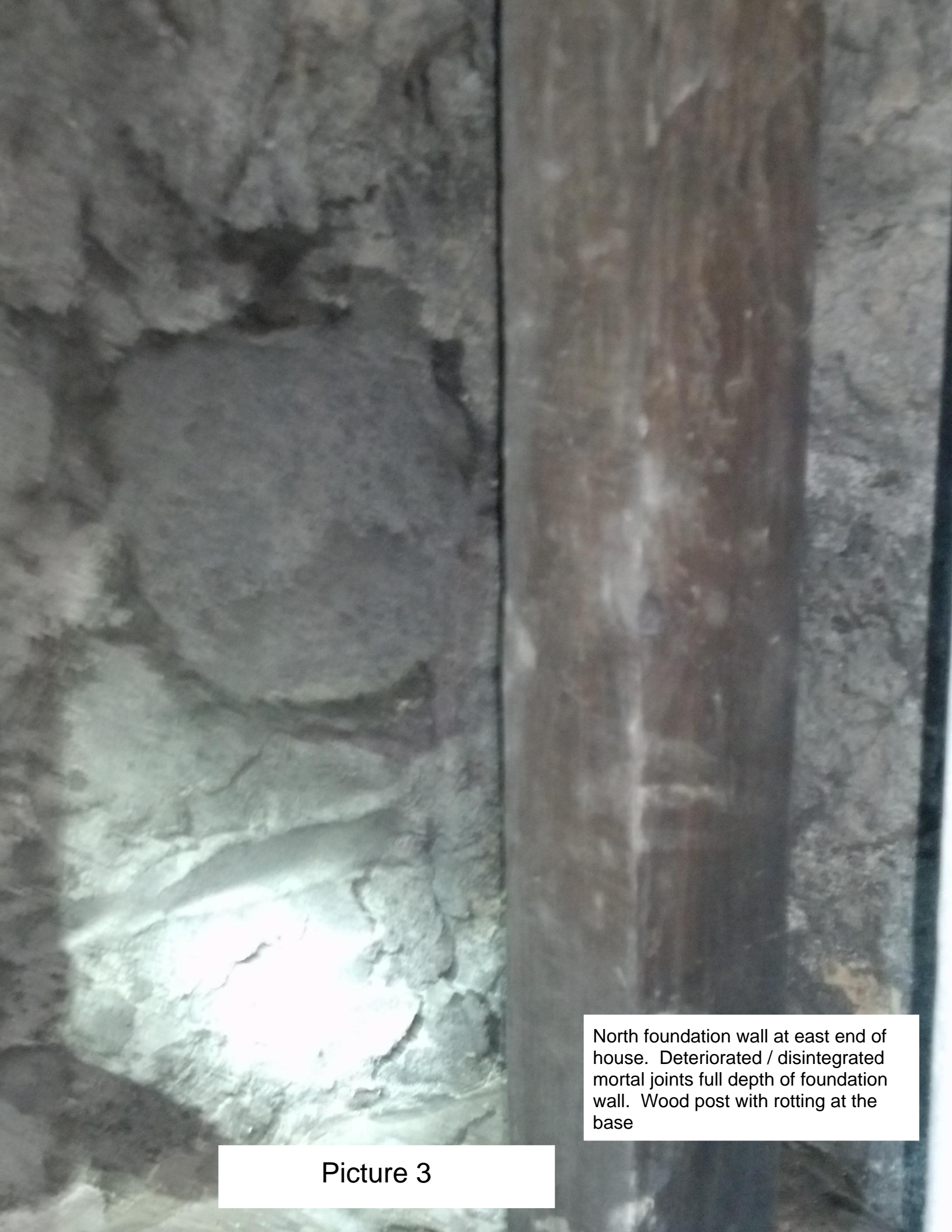
Picture 1

West foundation wall. Failed foundation wall with wall cave in. Wall was braced at some point in time, but bracing did not work



Picture 2

North foundation wall at east end of house. Bowed in section of foundation wall. Deteriorated / disintegrated mortar joints full depth of foundation wall



North foundation wall at east end of house. Deteriorated / disintegrated mortal joints full depth of foundation wall. Wood post with rotting at the base

Picture 3



North foundation wall about mid point of house. Section of failed foundation wall

Picture 4





Picture 5

Inside corn foundation wall wall at east end of house. Deteriorated / disintegrated mortal joints full depth of foundation wall



Picture 6

South foundation wall at east end of house. Deteriorated / disintegrated mortar joints full depth of foundation wall



East end of basement. Rotted column base

Picture 7



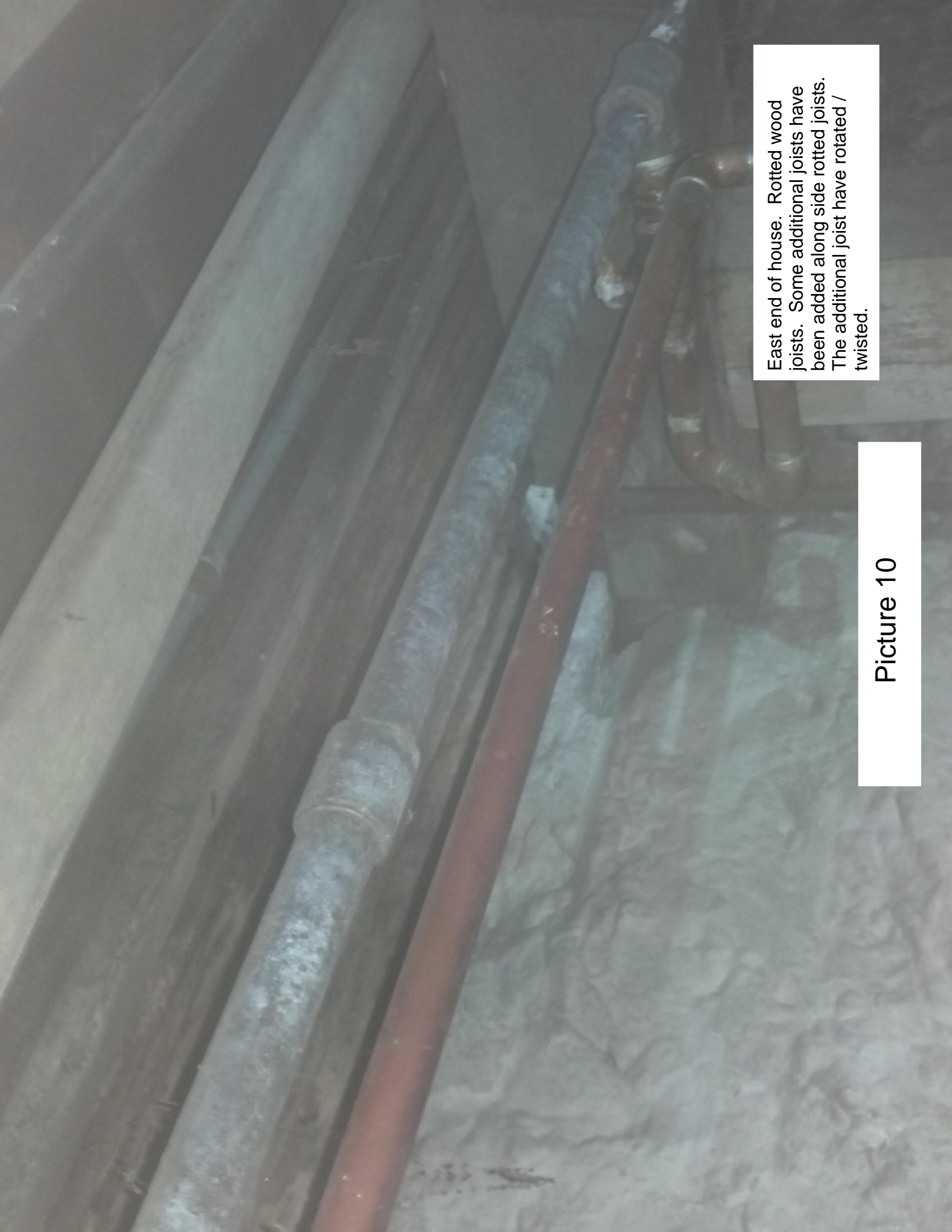
Basement wall post located at north side of house. Significant rotting at base of the post. Structural capacity severely diminished

Picture 8



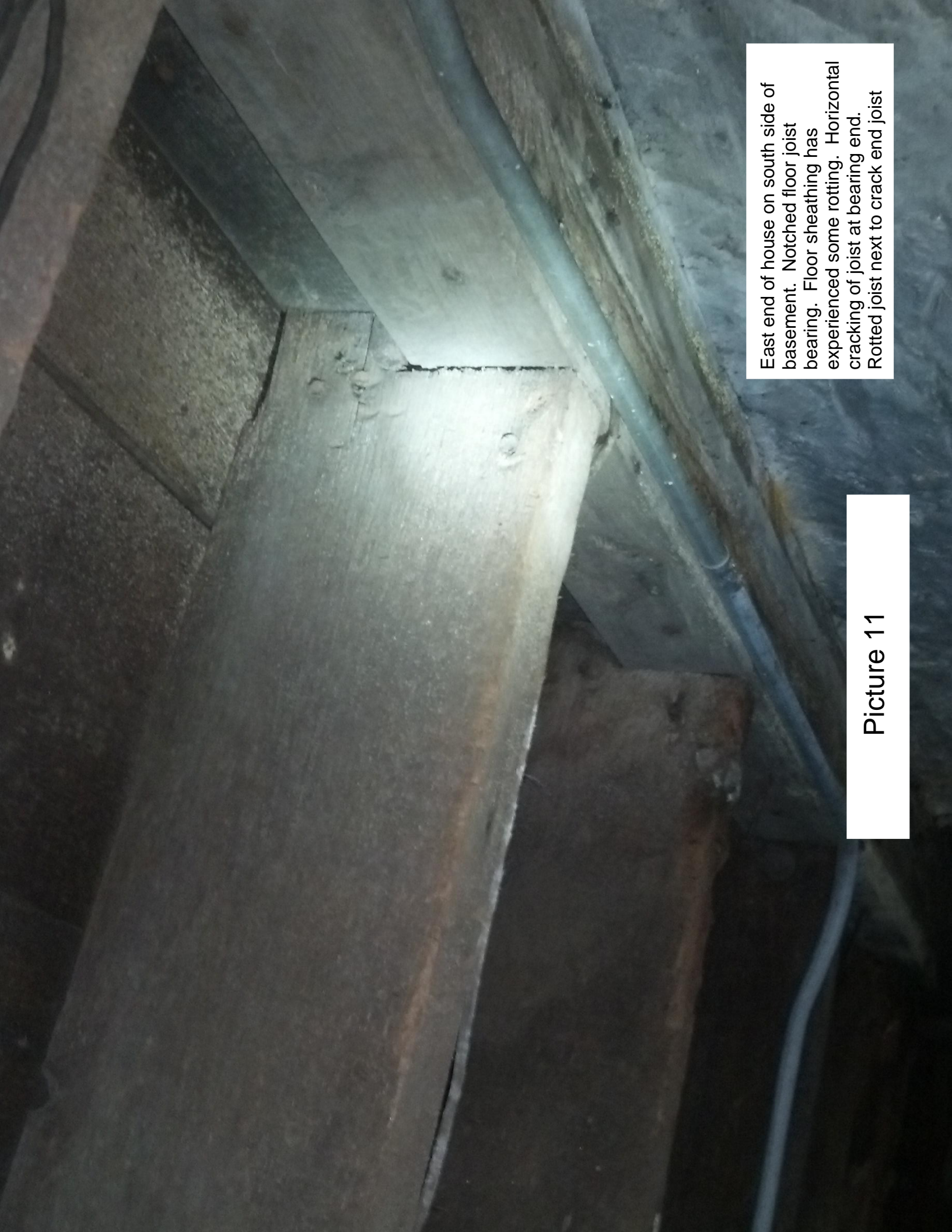
Basement wood post located in west end of basement. Significant rotting at base of column

Picture 9



East end of house. Rotted wood joists. Some additional joists have been added along side rotted joists. The additional joist have rotated / twisted.

Picture 10



East end of house on south side of basement. Notched floor joist bearing. Floor sheathing has experienced some rotting. Horizontal cracking of joist at bearing end. Rotted joist next to crack end joist

Picture 11



East end of house on south side of basement. Notched floor joist bearing. Joist end has experienced rotting.

Picture 12





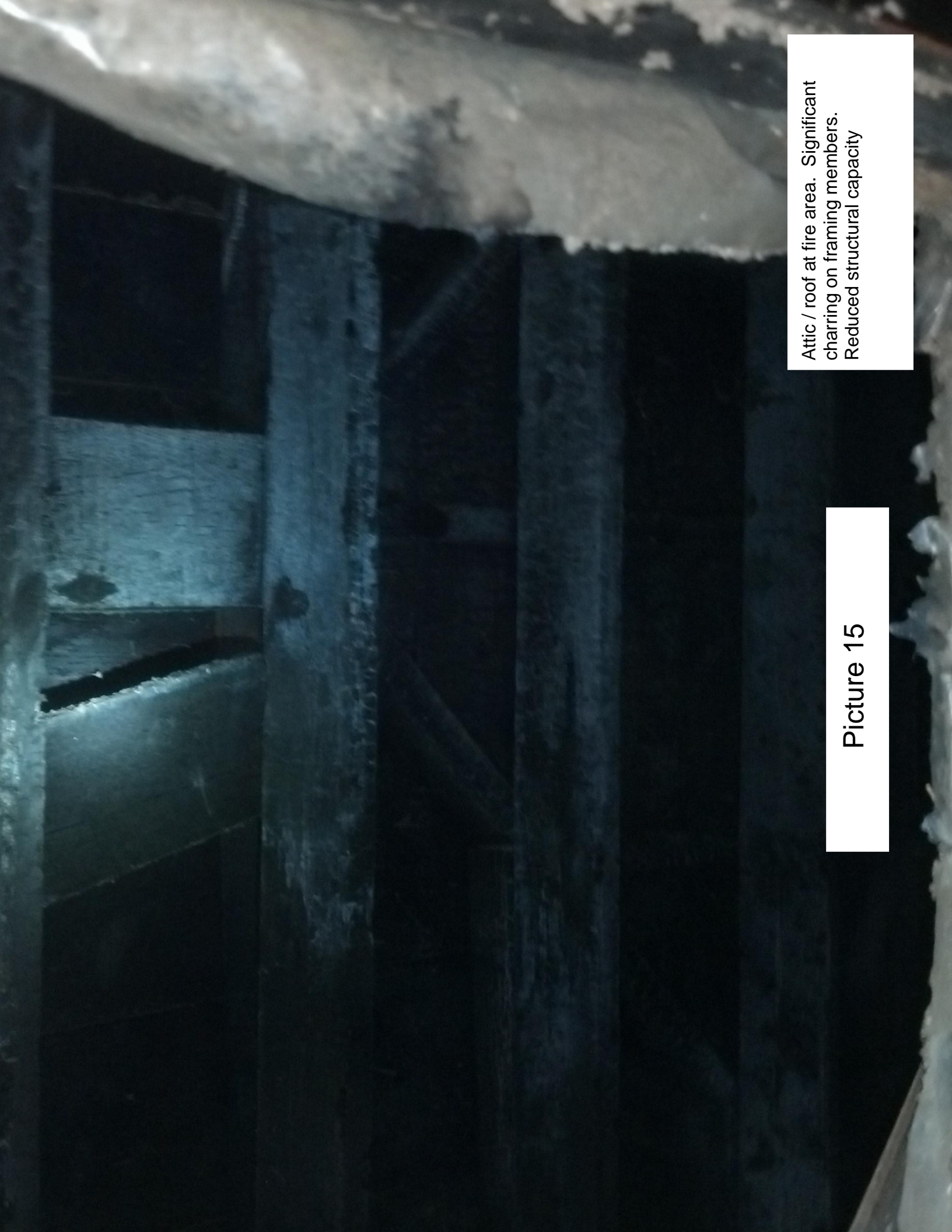
First floor ceiling located at south side of house. Evidence of significant water infiltration over time.

Picture 13



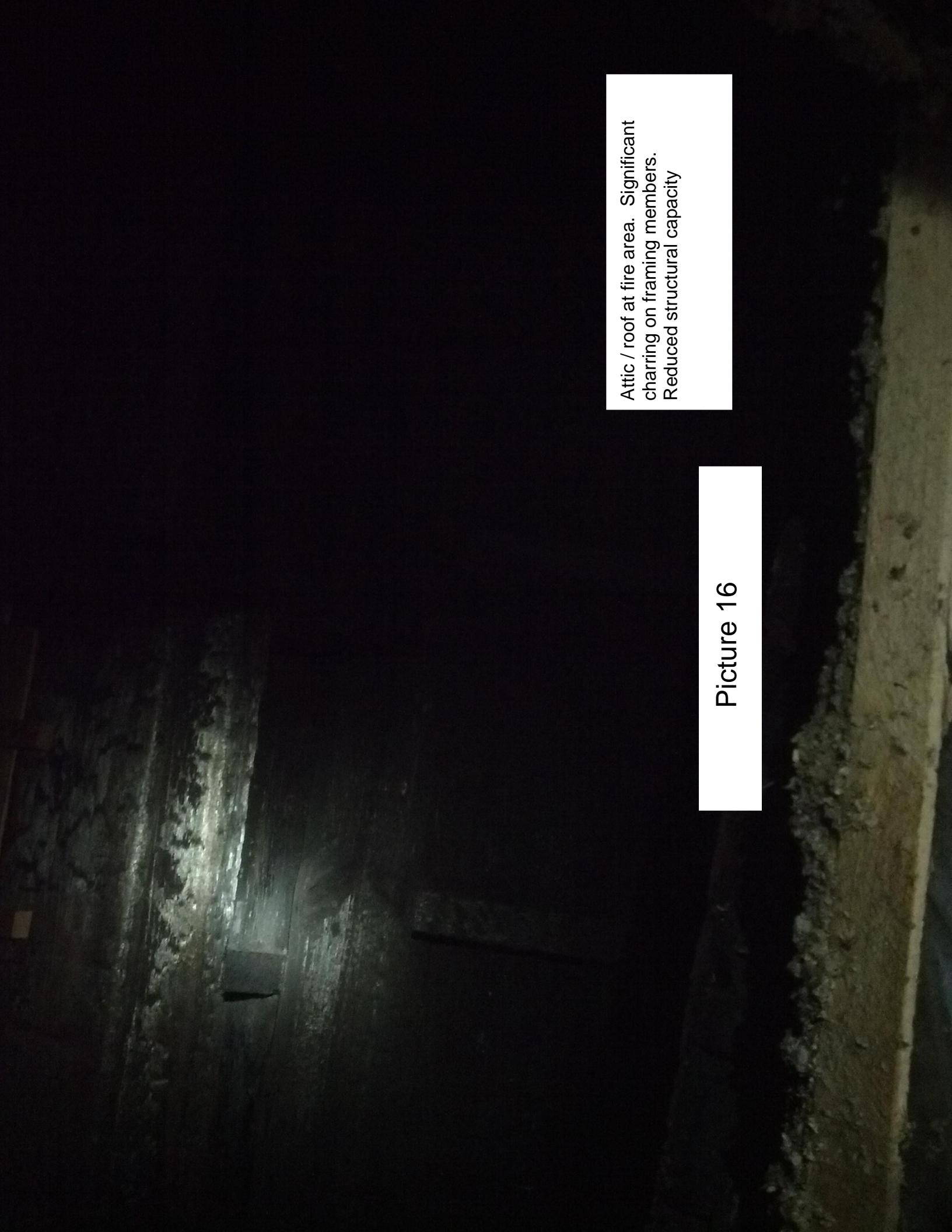
Third floor ceiling located at south side of house. Evidence of significant water infiltration over time.

Picture 14



Attic / roof at fire area. Significant charring on framing members. Reduced structural capacity

Picture 15



Attic / roof at fire area. Significant charring on framing members. Reduced structural capacity

Picture 16



Second floor east bathroom ceiling / third floor framing. Fire Damage to floor framing. Fire significant to reduce structural capacity of members.

Picture 17



South foundation wall at back of house.  
Cracked foundation wall due to  
settlement

Picture 18



First floor west end of house. Buckled wood flooring. Cause unknown. Could be do to floor movement or significant moisture / wet floor.

Picture 19



North wall at third floor. Diagonal wall crack. Evidence of structural movement / settlement

Picture 20