May 31, 2023

Keith Ziobron, PE
Associate Vice President
CHA
t. 678.787.9576
e. KZiobron@chacompanies.com

RE: Hotel Building Structural Observation

MDS Project # 3422

Site Address: 117 Chocktoot Street
Chiloquin, OR,

Present: Britt Killian
MD Structural Engineering, Inc.
t. 360.433.9093

Cathy Stuhr
City of Chiloquin
e. cathy@cityofchiloquin.org

Dear Keith,

On April 6, 2023 I made a structural observation of the Hotel Building in Chiloquin, OR at the above site address. The purpose of my visit was to make a general structural assessment of the existing structure and feasibility of its rehab.

The hotel building is an "L" shaped two-story (above grade) building of unknown age approximately 80 ft x 45 ft in plan. At the time of my visit, all of the interior finishes had been removed allowing observation of the main structural elements with exception of the masonry skim coat on which covered the interior surface of the exterior walls.

The exterior walls with exception of the south facing wall on Chocktoot Street are full height concrete masonry units (CMU) supported on a cast in place concrete foundation. It appears that the bottom half of the south facing wall is constructed of cast in place concrete to allow for large storefront openings. There appears to be a cast in place concrete band around the building at the levels of the roof and second floor framing. The roof structure consists of 2x6 purlins and ceiling joists spaced at 16" OC supported at the exterior CMU walls and interior bearing wood stud walls. The roof deck over the purlins is lumber planking. The 2nd floor joists are 2x12 at 16" OC and 12" OC depending on location and span. Like the roof members, the joists are supported at the exterior by the CMU walls and near the center of the building by a wood stud bearing wall. The 2nd floor decking is also a lumber planking laid diagonally across the joists. The main floor joists are 2x12 spaced at 16" OC supported on a grid of wood posts and beams in the crawl space. The main floor deck appears to be a lumber plank surface similar to the 2nd

floor. Several of the posts are supported in turn by wood beam footings bearing directly on the soil. Additionally, a few of the timber footings were perched directly adjacent a vertical cut in the soil behind a concrete "Basement" wall. This condition should be remediated to provide adequate stability to the soil.

It appears that at some time in the past, a seismic retrofit for this building was implemented. At the roof level, a continuous steel channel around the perimeter of the building is visible and appears to be anchored periodically to ceiling joists by hold-down anchor devices. I could not determine if the roof was plywood sheathed at the time the roof anchorages were installed. At the second floor level, the joists are also periodically anchored to the concrete band with a post installed bolt and hold down anchor similar to the anchors used at the roof level.

The exterior CMU appears to be generally in fair condition however some diagonal cracking in the masonry joints was noted from the exterior of the building in several locations indicating some level of differential settlement of the foundation elements. Additionally, at various locations around the exterior of the building, it appears that grout has come out of the joints over the years. The wood roof purlins, upper floor joists and their decking all appear to be in good condition. No rotted or damaged members were noted. There is one section of the upper floor joists on the west side of the building that appear to be sagging approximately 3/4" however no cracking or signs of damager were observed in those joists. The main floor joists & beams generally appear in fair condition however due to direct contact with the ground some of the supporting posts show signs of water intrusion. See the attached appendix for reference photos.

In general, the gravity-force-resisting system for the building appears to be laid out in a logical manner with a competent load path to the foundation. I performed some preliminary calculations of the roof purlins and second floor members to get a feel for their adequacy

1. I reviewed the 2"x6" roof purlins for the multi-span conditions observed assuming the lumber was a select structural Doug-Fir material based on the perceived age of the building. Roof members appear to be utilized at 80% under full snow loading therefore appear adequate without modification.

2. I reviewed the 2x12 upper floor joists for the current spans assuming a residential loading. Given the residential loading, the joists on the west side (16" OC spacing) are utilizing 90% of the available strength but are 8% over the current code value for deflection. The joists on the east side of the building (12" OC spacing) are utilizing 100% of their available strength and are 42% over the current code value for deflection. Since the joists appear to have sufficient strength under the fully loaded condition, I believe they are structurally adequate. Although they appear to have sufficient strength, if deflection is a concern, strengthening the floor system may be desired.

Buildings are designed to resist both gravity loads and lateral loads. Lateral loads are resisted by a Lateral Force Resisting System (LFRS). The LFRS is comprised of the building elements that resist wind and seismic forces. At the time the Hotel building was constructed, lateral forces were not generally considered in the design and construction of buildings. It is now considered a critical part of structural design and building safety. The lateral force resisting system for the Hotel building consists of unreinforced masonry wall with wood diaphragms. At the roof, the diaphragm consists of plank sheathing installed perpendicular to the rafters/ joists. At the floors, the diaphragm consists of diagonal sheathing. Unreinforced masonry is one of the poorest performing building materials for seismic design due to its significant weight and brittle nature. Plank sheathed diaphragms perform poorly during seismic events. This building will very likely suffer major damage and has the potential to collapse in a design seismic event due to the brittle nature of the construction materials.

Code required structural improvements:

Structural upgrade requirements are minimized when the following conditions are met. The future use of the building is consistent with the original/historic building use, the building material weights are not increased by more than 5%, and there are no alterations to the structural walls (minor alterations to load bearing walls are permitted). If the above conditions are met, I anticipate the following structural work will be required at a minimum:

Roof:

- If not already present, install 1/2" CDX or OSB sheathing will be required to be installed over the existing planks on the entire roof.
- The masonry parapet will need to be braced back to the roof structure.
- CMU mortar joints will need to be re-pointed.
- If non-bearing walls are removed, certain adjacent parallel walls will likely need to be sheathed with ½" CDX or OSB.
- At locations where out of plane seismic anchors are perpendicular to the roof joists, they will need to have their load path completed by having the ceiling joists properly braced/ connected to the roof diaphragm.

Crawlspace:

- Remove all untreated timber footings in direct contact with the ground and replace them with properly sized reinforced spread concrete footings.
- Footings supported adjacent vertical cuts in the soil should have crushed gravel or some other compacted medium placed between the concrete "basement" wall and the footings to prevent instability of the soil below the footings.

If the intended uses for the structure increase the Risk Category, alter the existing lateral force resisting system, or increase the building weight, significant structural improvements will be required in addition to those listed above. The required structural improvements will include a new lateral force resisting system for the building which may include steel braced frames, steel moment frames, or plywood sheathed shear walls with new concrete foundations. The floors will then be required to be secured to the frames/ shearwalls with drag struts that collect seismic forces from the structure and deliver it the frames/shear walls.

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In general, the overall structure is in fair condition, the gravity system for the building appears to provide competent load path to the foundation. The lateral force resisting system is inadequate for current code level design forces.

I would estimate the cost to perform the structural upgrades listed above would be somewhere between $150,000 and $300,000.

If you have any questions regarding this letter or require clarification of specific items, please do not hesitate to contact me at our office.

Best Regards,

STRUCTURAL
REGISTERED PROFESSIONAL
ENGINEER
75801PE
OREGON
JANUARY 12, 2010
BRITT KILLIAN

Britt Killian, SE

5/31/23

RENEWAL DATE: 6-30-2023

APPENDIX

MD Structural Engineering	Project Name: *Chocktoot Hotel Building*	
	Project No: *3422*	Sheet No.
500 BROADWAY ST. STE. 460, VANCOUVER, WA. 98660 — PHONE: 360-433-9093, EMAIL: MIKE@MDSTRUCTURAL.COM	Date: *5/19/23*	Engineer: *BK*

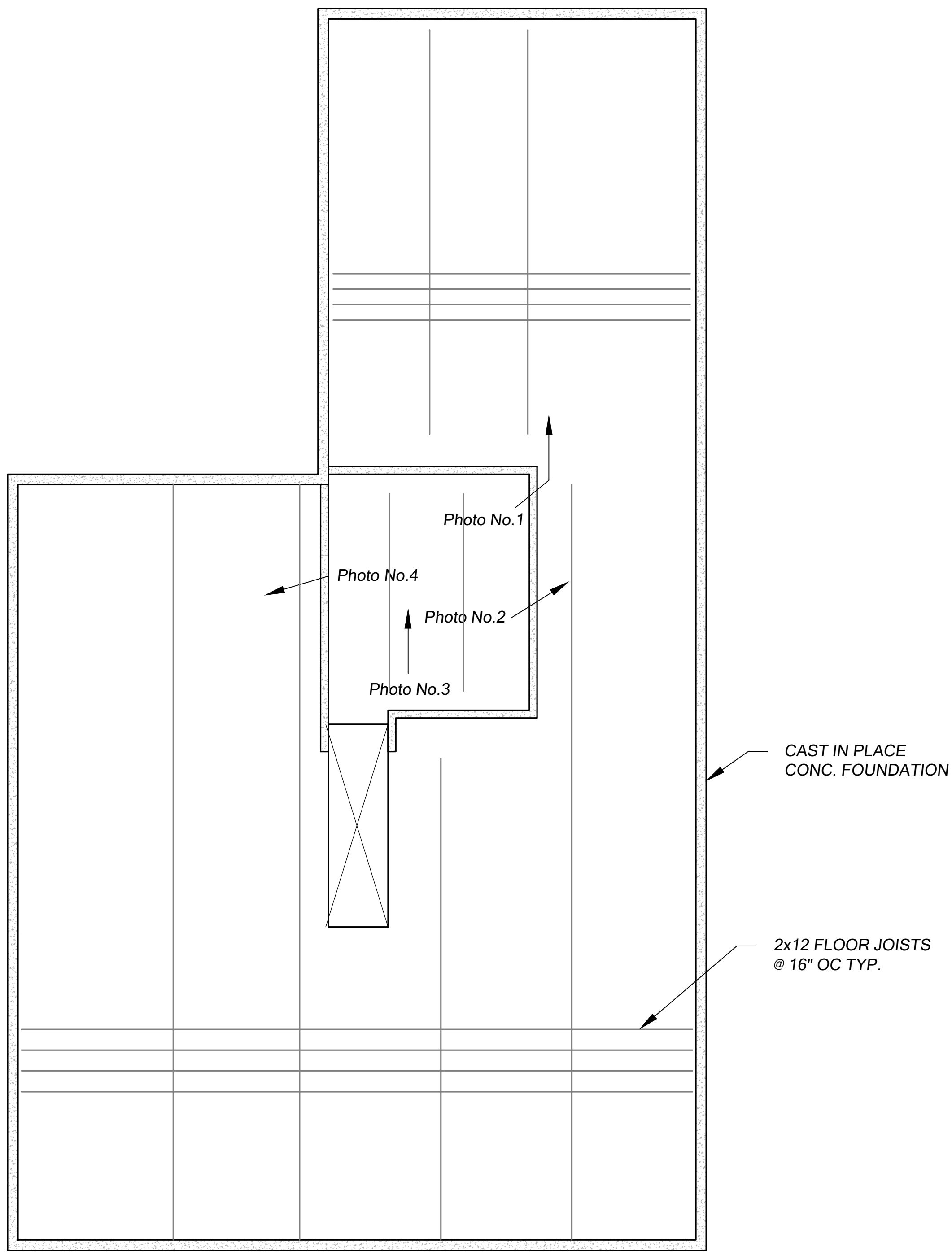

PHOTO MAP (1st floor framing over fdn./ crawlspace beams)

MD Structural Engineering
500 BROADWAY ST. STE. 460
VANCOUVER, WA. 98660
PHONE: 360-433-9093
EMAIL: MIKE@MDSTRUCTURAL.COM

Project Name: *Chocktoot Hotel Building*	
Project No: *3422*	Sheet No.
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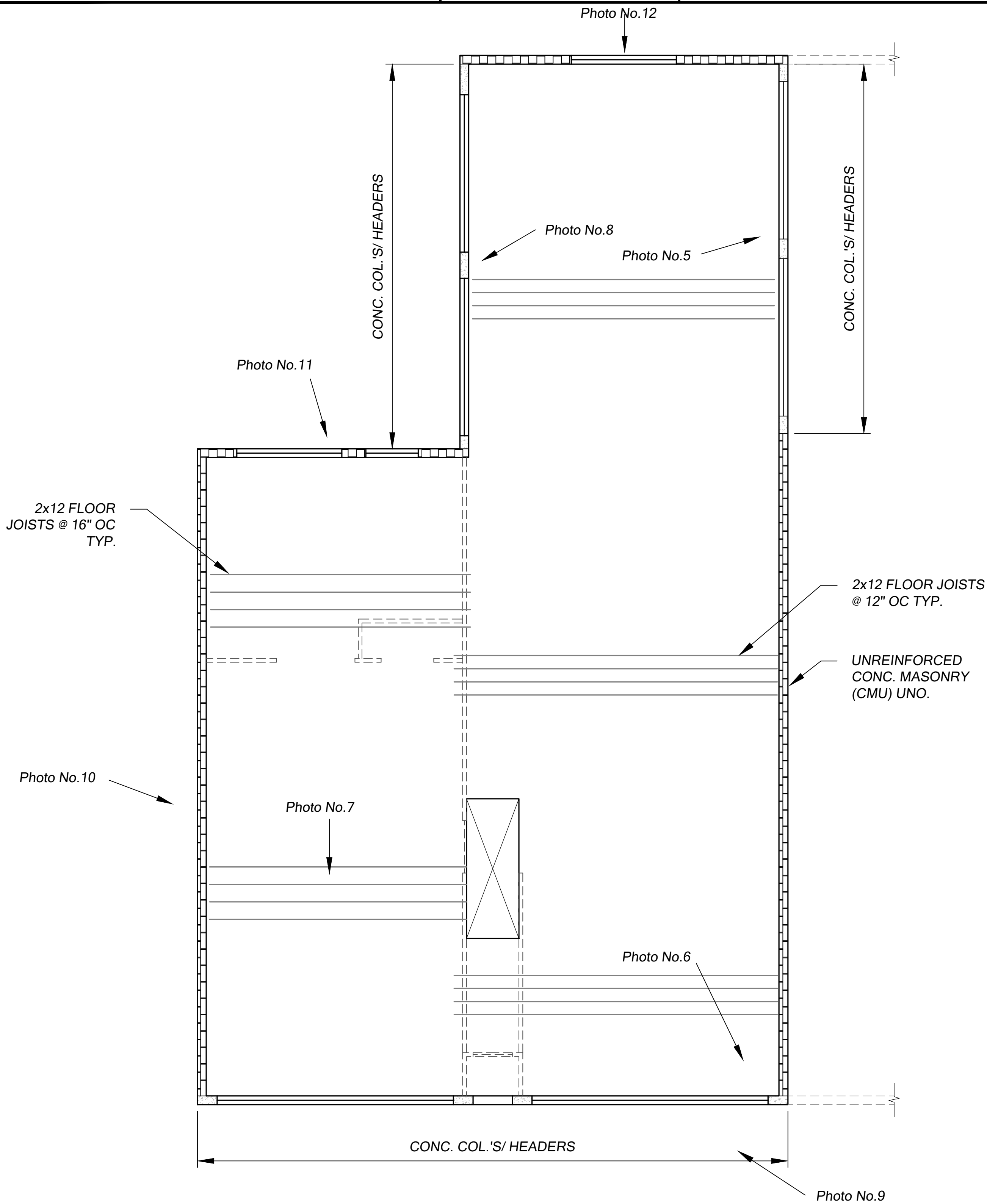

PHOTO MAP (2nd floor framing over main floor walls)

MD Structural Engineering
500 BROADWAY ST. STE. 460
VANCOUVER, WA. 98660
PHONE: 360-433-9093
EMAIL: MIKE@MDSTRUCTURAL.COM

Project Name: *Chocktoot Hotel Building*	
Project No: *3422*	Sheet No.
Date: *5/19/23*	Engineer: *BK*

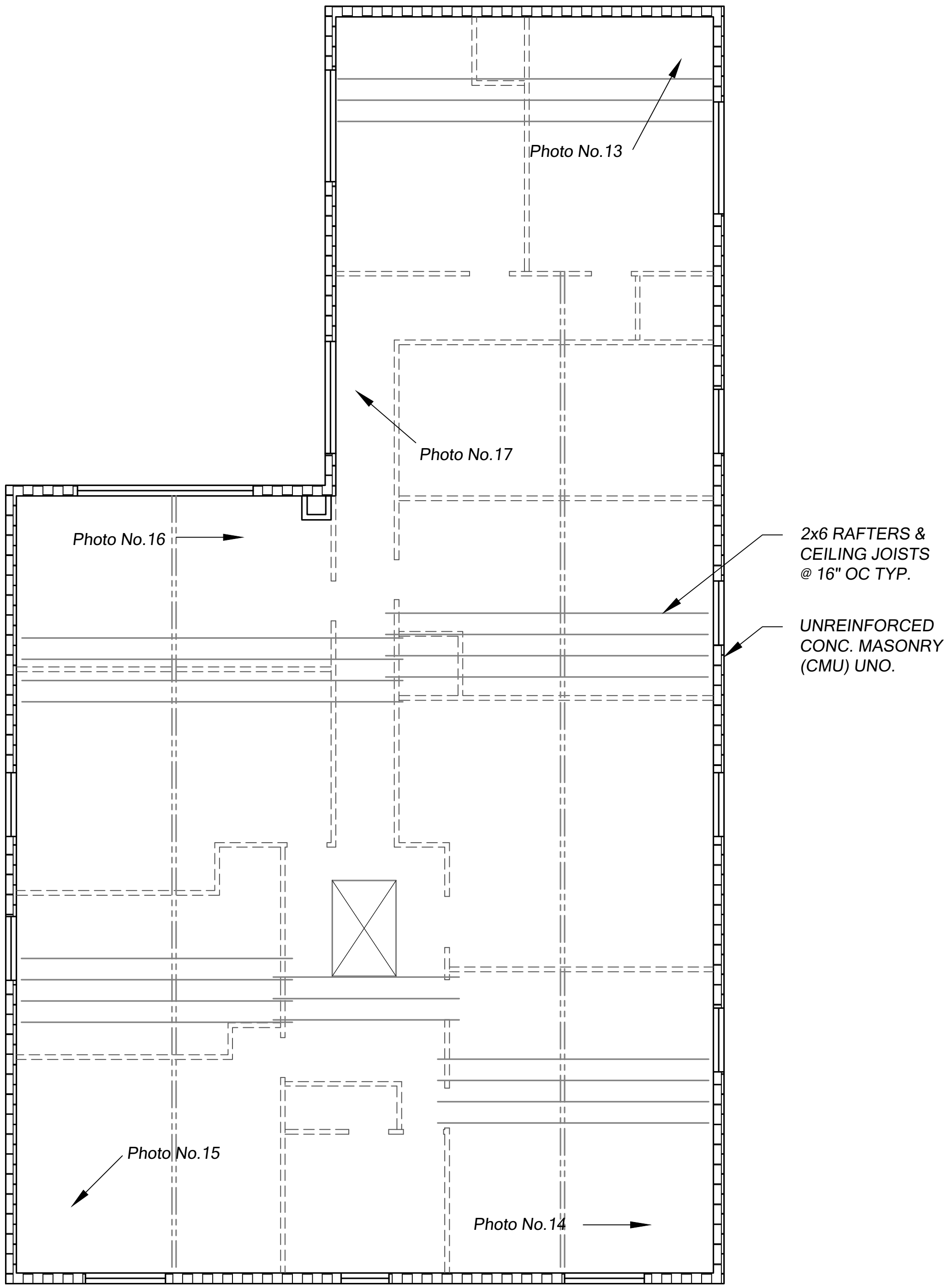

PHOTO MAP (roof framing over 2nd floor walls)

Photo No. 1 (Crawlspace post on dirt)

Photo No. 2 (Crawlspace footing a vert. soil)

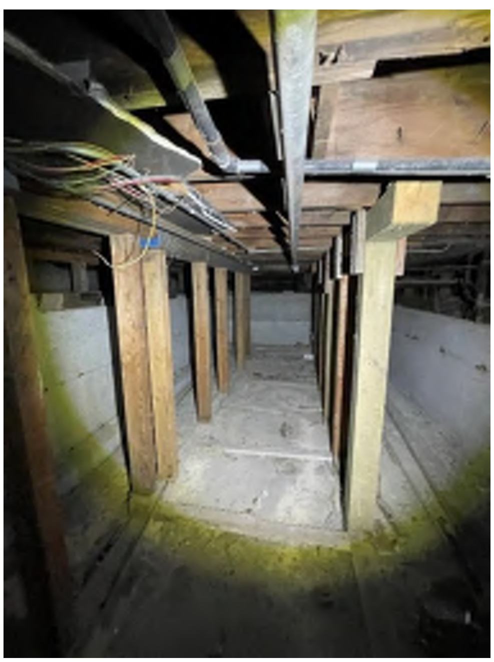

Photo No. 3 (Crawlspace "Basement")

Photo No.4 (Timber footings on dirt)

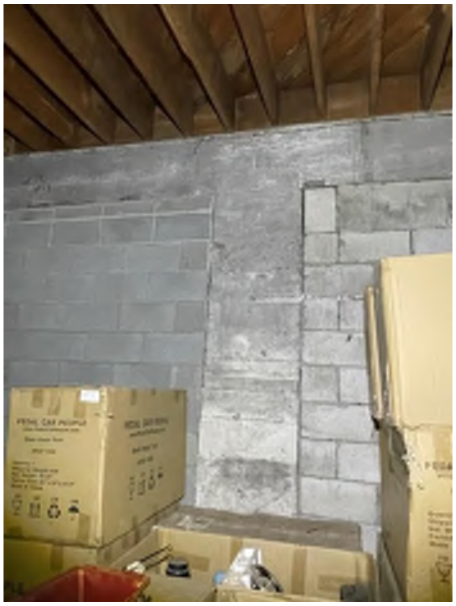

Photo No. 5 (Conc. posts/ beams)

Photo No. 6 (Conc. beam at south wall)

Photo No. 7 (West side floor joists)

Photo No. 8 (Conc. post/ beams)

Photo No. 9 (Street front wall, south)

Photo No. 10 (Cracking west wall)

Photo No. 11 (North wall west side)

Photo No. 12 (North wall)

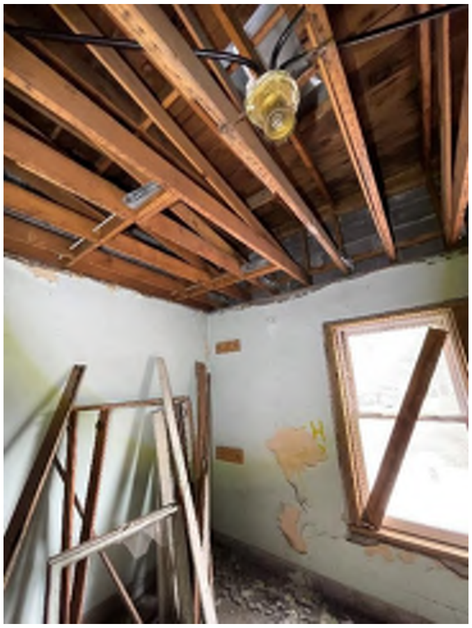

Photo No. 13 (RaftersW/ ties)

Photo No. 14 (RaftersW/ ties)

Photo No. 15 (RaftersW/ ties)

Photo No. 16 (RaftersW/ ties)

Photo No. 17 (Rafter ties)