

Structural Observation Report

253 W. Main St.

Los Gatos, CA

for

**Mike and Kim Wasserman
68 Broadway
Los Gatos, CA 95030**

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Subject: Structural Observation Report
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CSC job # 20-010

INTRODUCTION

At the request of the owner, I traveled to the existing residence located at 253 West Main St. in Los Gatos, CA on Thursday, February 6, 2020 in order to observe the condition of the existing residence. Upon my arrival, I met with yourself, and David Zicovich. While at the site, I took photos, dimensions, and notes on the existing condition of the house including information on the integrity of some of the visible structural members. The purpose of my site visit was to gain an understanding of the following items listed below and to provide a written report that summarizes the findings. The items that were observed on the site visit were as follows:

- Layout of the residence
- Configuration of residence
- Foundation system
- Framing sizes and spacing at floor and roof
- Structural integrity of the visible elements of the gravity and lateral force resisting systems
- Observation of visible structural settlement, or lateral shifting at various locations.

The intent of this report is to provide a qualitative analysis of the current structure in order to provide you with a better understanding of the current state of the structural condition and to bring to light the structural deficiencies in the gravity and lateral force resisting systems which are below current code standards for performance and safety. The evaluation being provided is not based upon full code compliance, but rather based upon basic building code performance for gravity framing configurations, lateral force resisting principles, and basic foundation design and performance principles. Having seen the structure and observed the existing conditions, the termite report by Homeguard Incorporated dated 6/20/19, and the home inspection report by HomeGuard Incorporated dated 6/20/19, this report is being written on the basis that currently, there are many structural safety and performance concerns associated with the existing residence for both gravity and lateral load resistance. These concerns are noted below.

EXISTING CONSTRUCTION

The house was built circa 1890 with conventional construction and techniques for that era of construction. It is a single story house with the perimeter foundation of the house being a concrete stemwall. The embedment of the foundation into grade is not known at this time, but is likely not meeting a minimum of 12" into grade. The visible width of the concrete stemwall appears to vary, but is approximately 10". The raised wood floor framing is full dimension 2x6 floor joists at 24" oc, spanning approximately 5' in the North South direction. The 2x6 wood joists bear directly on top of wood cripple wall systems which run East/West and are approximately 5' apart. Some joists have vertical 1x10's nailed to the side and acting as support posts(see photo 1 in the appendix) . This is a very unusual and undesirable condition. The cripple walls and the vertical 1x posts bear directly on top of horizontal wood member which are in direct contact with grade. It is not know at this time what type of wood comprises the floor framing and cripple walls supports, but it appears to be non-pressure treated Douglas fir. Straight 1x planking is used for the floor sheathing which spans between the floor joists. A type of built up rim joist system occurs directly over the top of the concrete perimeter stemwall. From my vantage point under the floor, anchor bolts which bolt the mudsill down to the concrete were not visible. At the underfloor access at the East side of the residence, a great deal of water staining, lumber decay, and termite damage could be seen on the lumber at many locations. The overall condition of the underfloor area, floor framing, supports, cripple walls, and integrity of the lumber is poor. See below for additional and more specific commentary on the gravity and lateral force conditions of the underfloor area.

The exterior wall systems are comprised of standard full dimension 2x4 studs, though the spacing of the studs are not known. At one small location at an exterior wall, ends of horizontal 1x sheathing was visible. Horizontal 1x sheathing was a common siding material for homes in that era. See below for additional commentary on the lateral force resisting characteristics of horizontal sheathing.

The roof system and ceiling system are comprised of conventionally framed rafters and joists. The roof system is framed with full dimension 2 x rafters with spacing that vary throughout the roof. A pitch changes occurs at the eaves. The main pitch of the roof is 7:12 and changes to 2:12 at the eaves. In many cases the roof rafters appear to be spaced at 36" oc or greater. It appears that a layer of straight sheathing creates the main roof diaphragm, running perpendicular across the top the rafters. The ceiling joist system appears to be a conventional system comprised of 2x ceiling joists with varied spacing and varied span lengths, primarily spanning in the East and West direction and bearing on top of various interior bearing walls where available.

STRUCTURAL OBSERVATIONS – GRAVITY

Due to the age of the structure, building practices at the time of construction, degradation of materials over time, and the performance of the supporting soil under the structure, the current condition of the residence is very poor in terms of its gravity and lateral force resisting

systems.

There are a tremendous number of deficiencies noted with regard to the gravity framing system when it comes to the roof, walls, floor framing, and foundation. The significant deficiencies are noted to be the following:

Raised Wood Floor

- Extensive moisture staining, dry rot at the built up rim board over stemwall, as well as termite damage being noted in the underfloor of house and in the siding as noted in the termite report and the home inspection reports that would need to be repaired and or replaced entirely. In the areas of the built up rim board over the stemwall, degradation could be seen in the joist and blocking which support the walls and roof (See photo 1 in the appendix). This is a key component of transferring both vertical and lateral loads to the foundation is of great concern as to its condition.
- Throughout the entire underfloor area, untreated wood cripple wall framing occurs which bears directly on top of lumber that is embedded in grade with improper wood to earth separation. It does not appear that any of the floor framing is moisture or decay resistant lumber and thereby subject to termite and dry rot deterioration. (See photo 1 and 4 in the appendix)
- Though it could not be seen, it is likely that there is a tremendous amount of dry rot damage and termite damage to the exterior walls studs.
- Lack of visible anchor bolts from mud sill to foundation(See photo 3 in the appendix)
- Lack of significant, identifiable connections from walls, to rim board and rim board to mud sill (See photo 3 in the appendix)
- The embedment of the stemwall concrete footing is likely not 12” into grade(see photo #2 in the appendix)
- Due to the era of construction, the concrete stemwall footing is likely unreinforced and therefore unable to span across local soil irregularities and have any ductility in an earthquake event. (See photo 2 in the appendix)
- It appears that rainwater from downspouts, and landscape water has partially scoured away the dirt under portions of the exterior stemwall(see photo 2 in the appendix)
- Quite a bit of settlement has occurred in the floor framing system and is easily felt when traveling through the house. The current settlement of the house is causing additional, unwanted eccentricities and forces to be applied on the framing system and foundations which were certainly never intended to resist. Due the improper compaction of the pad, and the generally settling of the house over time, the house undergone some level of settlement. The uneven floors and exterior areas can potentially pose a threat to the occupants as tripping hazards.

Roof framing

As mentioned above the roof framing is a conventionally framed system of rafters, ceiling joists, ridges and collar ties. However, due to the era of construction, the roof system is deficient in the following areas:

- Rafters improperly connected at ends(ie wall and ridge)
- Collar ties are insufficiently located in some cases
- Purlin and purlin braces are inadequately sized and not properly located for the size and spacing of supports
- Ridge beam is not an adequate size
- Ceiling joists do not have proper lap splice and nailing over interior walls to adequately transfer tension forces due for conventional roof system.
- Ceiling joists are not properly or adequately nailed to the rafters at the heel
- Eave rafters are not properly supported/braced where pitch change occurs(see photo 6 in appendix)
- Blocking between rafters over the wall, where occurs is not adequately connected to the double top plate at the top of wall
- Strapping over the ridge from rafter to rafter does not occur.
- Although the chimney has been cut down to the top of the roof level, the brick fireplace is not properly anchored to the wall and likely does not have an adequate footing located below it.(see photo 5 in the appendix)
- Mild cracking and evidence of settlement could be seen at various location of the ceiling framing and wall framing. Cracking in the wall finishes could clearly be seen at corners of door frames indicating that foundation settlement had occurred. In one location in the living room, a significant level of settlement was evident in the ceiling finish indicating a great deal of settlement had occurred in the vicinity of the clipped ceiling.

In essence, although the roof is framed in a conventional manner, the system is deficient in light of current standards.

STRUCTURAL OBSERVATIONS –LATERAL

The current lateral force resisting system for the residence is a wood siding shearwall system which is comprised of horizontal wood siding nailed intermittently to heavy existing wood studs. The nailing of the wood siding to the studs is not known at this time. It is likely that only a couple nails occur from each board to each stud. As a whole, there are serious concerns about the existing wood horizontal siding to act properly as a shearwall system, properly carrying the lateral wind and seismic loads down to the foundation. In addition, there are likely no shearwall holdowns located at the ends of any segments of wall, which represents a significant performance hazard in an earthquake. Starting from the roof and working our way down to the foundation, a proper and continuous lateral load path does not occur without considering the use of toenails and other various noncompliant, or inadequate forms of shear transfer connections, especially in this high seismic region. This condition is exacerbated by the fact that the anchor bolts down to the foundation, although not visible, where I was crawling, likely occur, but are sorely insufficient and their ability to resist lateral loads is questionable, potentially connecting lumber of questionable integrity to concrete with questionable integrity. In addition, an identifiable lateral load path from wall sheathing to rim board and rim board to mud sill was not evident, thereby posing a significant risk of poor performance in a heavy ground motion earthquake.

Similar to the lack of lateral force load path items in the foundation system, and since it is my understanding that a retrofit has never been done on the house, the roof system appears to severely lack positive connections from the roof diaphragm to the blocking to the wall double top

plate. This would result in poor performance of the lateral force resisting system in a heavy ground motion earthquake. In addition the gable walls appear to lack a sheathing system that can fully and completely transfer roof diaphragm forces to the exterior walls(see photo 7).

In order for this residence to meet current regulations and to make the house compliant for life safety, a proper lateral load path from the roof down to the foundation would need to be retrofitted, which would virtually affect every member from the roof to the foundation in one aspect or another.

CONCLUSION

In conclusion, as noted above, there are significant gravity and lateral force resisting system concerns for this residence. The roof, ceiling, floor framing, and foundation systems appear to be quite deficient in comparison to current standard and the amount of strengthening, framing, and attachment construction that would be required to bring the house forward to a reasonable level of performance for life safety for gravity and lateral forces would be exhausting and not feasible. In addition, due to the invasive nature of the structural repairs and retrofit that would be need to be done in so many locations, in many instances it will be required to gain access to those locations by the removal of any interior finishes (ie plaster/sheetrock, flooring, cabinetry, plumbing, electrical) or exterior finishes(ie shingles, any building paper, trim, fascias, exterior flooring, exterior concrete, etc). In my professional experience, with all of the construction to be performed as noted above, it may not make financial sense to go forward and perform all the work noted above when compared to the cost of tearing down and providing all new construction. However, that will need to be quantitatively evaluated by the proper professional.

LIMITATIONS

This letter has been generated in a manner which is consistent with the standard of care in the industry for the area at this time. It should be noted that Cornerstone Structural Consultants has not performed structural gravity, lateral, shrinkage, or movement calculations on any of the existing members or connections in any portions of the residence noted above. In addition, we do not make any warranty, express or implied, about the abilities of the existing framing and foundation system to resist the applied loads, nor do we guaranty the performance of any of the existing framing, connections, or foundation. We do not guarantee that future movements of the house and foundation will not occur, nor that the additional cracks in interior or exterior finishes will not open, re-open or are initiated.

If you have any questions, please don't hesitate to call me at (916) 897-9649.

Sincerely,
Cornerstone Structural Consultants

Chad A. Guptil, P.E.
License No. 60001





Photo 1



Photo 2



Photo 3



Photo 4



Photo 5

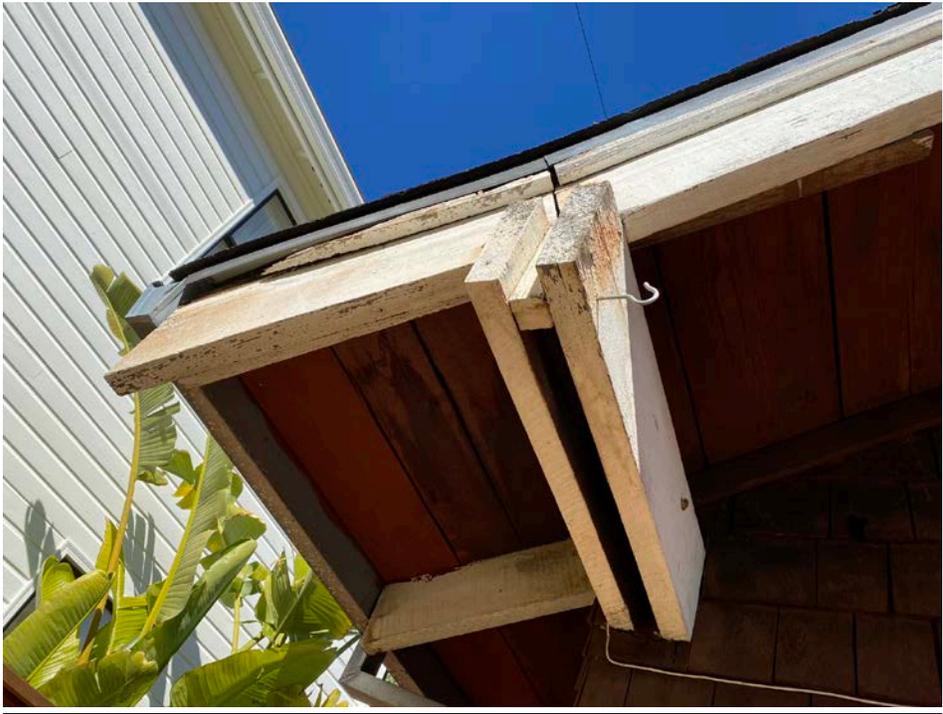


Photo 6



Photo 7