Midpeninsula Regional Open Space District

R-20-35
Meeting 20-08
April 8, 2020

AGENDA ITEM 3

AGENDA ITEM

Select a design alternative for the La Honda Creek Redwood Cabin, La Honda Creek White Barn, and Sierra Azul Beatty House

GENERAL MANAGER'S RECOMMENDATIONS

1. Select a design alternative for the following structures:
    a. La Honda Creek Redwood Cabin;
    b. La Honda Creek White Barn; and
    c. Sierra Azul Beatty House.
2. Direct the General Manager to return to the Board of Directors with a recommended award of contract to develop construction documents for the Board-selected design alternatives.

SUMMARY

The original purpose of the Structure Stabilization at Multiple Preserves Project (Project) was to assess and stabilize three District owned structures: The La Honda Creek Redwood Cabin, La Honda Creek White Barn, and Sierra Azul Beatty House (referenced as the Beatty Home in the attached Basis of Design document). On May 15, 2019, the Board of Directors (Board) authorized the General Manager to enter into a contract with ZFA Structural Engineers (ZFA) to assess and analyze various treatment alternatives for these three structures (R-19-63) and return with the findings for Board selection of the treatment alternatives. ZFA's condition assessment results, design alternatives analysis, and associated costs are outlined in the Basis of Design (BOD) reports (Attachment 1). Once the Board reviews and selects a design alternative for each structure, staff will proceed with design development and permitting and will return to the Board with a recommended award of contract to develop construction documents.

DISCUSSION

The original purpose of the Structure Stabilization at Multiple Preserves project was to assess and stabilize three District-owned structures: La Honda Creek Redwood Cabin, La Honda Creek White Barn, and Sierra Azul Beatty House. On April 24, 2019 and May 15, 2019, the Board authorized a two-phase project delivery approach and approved the Phase I scope (R-19-63):

- Phase I: structure assessment, basis of design report, and design alternative analysis (recently completed); return with findings for Board selection of the alternatives.
- Phase II: design development and implementation of the Board selected alternatives.

The Board authorized entering into a contract with ZFA for Phase I work at the May 15, 2019 meeting and directed staff to return to the Board at the completion of Phase I to present the findings and for Board selection of a design alternative for each structure. ZFA has completed their assessment and developed the BOD report for each structure. At the April 8, 2020 Board meeting, the Board will receive the reports and provide direction for Phase II of this project.

Design Alternatives

To complete their task, ZFA reviewed existing information for each structure, conducted inspections, performed non-destructive tests, researched governing agency requirements to analyze four design alternatives, and estimated preliminary costs for each design alternative. Their analysis included a review of potential permitting requirements taking into account the status of each structure as eligible for historic listing and appropriate governing codes. The assessment findings are summarized in the BOD reports, which details recommended repairs, schematic layouts, and cost estimates for the design alternatives. The design alternatives are as follows. Each alternative can include interpretive signage if or once the site is accessible to the public:

Alternative 1: **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structures; structure remains visible from a distance.

Alternative 2: **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, visitors can walk around the perimeter and view the structure up close.

Alternative 3: **Repair and rehabilitate the structure for reuse**:

- Redwood Cabin: retreat space, meeting space, or hikers hut
- White Barn: storage facility for District use
- Beatty Home: limited use retreat space

Structure is visible and accessible from the exterior and interior.

Alternative 4: **Remove the structure** and restore the underlying natural resource values.

Alternative #1 is intended to retain the structure as a landscape feature while maintaining public safety through fencing and signage. This option does not include stabilization improvements. The structure is retained and preserved as-is, in its current condition.

Alternative #2 addresses structural deficiencies to retain and stabilize the structure over the longer term, with no interior occupancy allowed. Its goal is to freeze or reduce building deterioration over time while preserving as many of the character-defining features as possible. Often, this alternative is undertaken to afford additional time to implement longer-term preservation, rehabilitation, or historic restoration work for a building.

Alternative #3 rehabilitates the building, improves site access, and includes any necessary interior and exterior improvements for private or public reuse of the structure.

Alternative #4 removes the structure. The District's Waste Diversion Policy would apply to recycle and salvage materials to the greatest extent possible. Photo-documentation would also apply to record the interior and exterior of the building prior to removal.

Condition Assessment for the Structures

Below are condition assessment summaries for each structure:

La Honda Creek Redwood Cabin

The La Honda Creek Redwood Cabin was constructed in 1928 and used as a recreational retreat by its original owner and organizations such as the YMCA and Rotary Club. It is an example of early recreational destinations and the region's history of logging. The site is in the upper portion of the La Honda Creek Open Space Preserve. The cabin is in a sloping forested area, approximately ¼ mile from Skyline Boulevard along a narrow, shared, private unimproved dirt and gravel driveway. The driveway crosses a culvert that needs to be replaced and a bridge that needs assessment and repair depending on the intended disposition of the cabin. It is in a closed area where public access is not currently permitted. The cabin is remote, is not adjacent to a maintained trail, and does not have any vehicle parking facilities.

The structure is a one-story redwood log framed building, that is currently unoccupied. Its interior contains a large stone fireplace in the living room, two small bedrooms, a bathroom, and a kitchen. The exterior consists of redwood logs, timber roof framing, and a perimeter wood deck. The wood deck is supported on vertical poles that are partially embedded into the ground.

A final Historic Resource Evaluation Report is being prepared and will be available in early April 2020 for the La Honda Creek Redwood Cabin. At present, preliminary results indicate that the Redwood Cabin is eligible for individual listing in the California Register of Historical Resources. Its character-defining features include its simple rectangular massing, simple gable roof, exposed rafters on long façade, exterior wide porch and railing, solid wood primary entrance door with decorative iron hardware, large central stone hearth on the interior, interior redwood log hanging light fixtures, and simple redwood plank flooring running longitudinally throughout the building.

ZFA's 2019 condition assessment concluded that, overall, the Redwood Cabin is in fair to poor condition; it exhibits many signs of structural damage and decay. The exterior door is in good condition. However, the door frame is in fair condition and the bottom of the door is in poor condition; both show significant rot and insect damage. The windows are out of square due to settlement of the foundation. The exterior logs are second or third growth redwood; their exposed ends, framing, and posts are in poor condition, due to exposure to humidity, insects, and rot. The porch, railing, and stairs surrounding the cabin have many areas of significant deterioration, from rot and foundation settlement; some areas have collapsed. The roof framing and trusses are in good condition, with no sign of deterioration, excepting weather intrusion at utility penetrations. There is significant decay where the foundation poles extend directly into the ground, making the structure unstable; 40 poles are in contact with the ground. There is no asbestos in the structure, but there is lead based paint.

To access the Redwood Cabin, one must travel over a culvert and bridge that are in poor condition. Fully assessing these crossings and making any required repairs to the bridge and/or culvert may be required to implement the Board-selected design alternative. There is another old, unused hazardous bridge that has collapsed near the Redwood Cabin. The cost to evaluate, replace, and/or remove these features is not included in the construction cost estimate for this Project. Note as a comparison, the cost for the Harkins Bridge replacement at Purisima Creek Redwoods Open Space Preserve was approximately $515,000.

In June 2019, Swaim Biological conducted a wildlife survey for the structure. Although signs of bats were not observed in the structure, the area surrounding the cabin provides suitable bat roost habitat. Signs of woodrats were present throughout the structure; four dusky-footed woodrat nests were found inside the structure. The riparian habitat near the structure also provides suitable habitat for woodrats.

La Honda Creek White Barn

The La Honda Creek White Barn represents a long history of ranching and mid-19th century vernacular architecture. Although its original construction date is unknown, a records search revealed that it was an integral part of cattle rangelands between 1860 and 1973. The site is in the upper portion of the La Honda Creek Open Space Preserve, which is currently limited to 10 visitor permits per day. The White Barn is located along Allen Road, approximately 1.5 miles to the east of the intersection of Bear Gulch Road and Allen Road. Allen Road is a private road; its traffic is generally limited to the residents in the area. The area surrounding the barn is bounded by rich vegetation, rolling grassland, and wooded areas. The White Barn is rectangular with redwood framing, a metal roof, and a wood floor.

In 2018, a Historic Resources Evaluation report was prepared for the White Barn. The report concluded that the White Barn was eligible for individual listing in the National Register of Historic Places and the California Register of Historical Resources. Its character-defining features include its use of local construction materials, medium-pitched gable roof, simple rectangular form, vertical board and batten redwood siding, board and batten clad doors, variety of utilitarian fenestration, hand hewn redwood post and beam construction, and simple wide-plank wood floors.

ZFA's 2019 condition assessment concluded that overall the White Barn is in fair to poor condition. The doors are operable, but displaced, heavily weathered, and have rusted hinges. The windows do not have any glazing and the frames are weathered and deteriorated. Some of the exterior wall has missing wood pieces that have created large gaps between the framing. These gaps have prompted the intrusion of animals, insects, water and humidity, warping of the wood, and biological growth. The wood floor sits on a wood beam foundation, which sits on or is buried in the ground. The foundation is in very poor condition. It is spongy and brittle to the touch. Most of the hinges and latches on the structure are rusted but work properly. The roof has some surface corrosion, and areas where light and water are getting through, but it is generally in good condition. The interior floor has significant evidence of termites, insect attacks, and biological growth. Several floorboards are loose, split, and displaced, making walking on the interior unstable. The roof and post and beam framing are in good condition, showing only minor signs of discoloring and humidity. There is no asbestos in the structure, but there is lead based paint.

In June 2019, Swaim Biological conducted a wildlife survey for the structure. Three bats were observed roosting inside the structure and the area surrounding the structure has suitable bat habitat. The White Barn is presumed to serve as a maternity roost site. Signs of woodrats were not observed in the structure.

Sierra Azul Beatty House

The Sierra Azul Beatty House sits on a 55-acre homestead that is located at 17820 Alma Bridge Road, in unincorporated Santa Clara County. It is in a closed area where public access is not currently permitted. The homestead contains a house, a workshop/garage, and a shed. Although there is an assortment of structures on the Beatty Property, the house is the only structure that was assessed as part of this Project. The house was built in the 1860s and is part of the former community of Alma. The Beatty House has a single wall construction with no foundation; its wood posts and exterior walls rest directly on the ground. The interior contains two small bedrooms, a parlor, a kitchen, and one bathroom.

In 2010, a Historic Resources Evaluation report was prepared for the Beatty House. The report concluded that the Beatty House is eligible for individual listing in the California Register of Historical Resources. Its character defining features include its intersecting gable roofs, simple flat trim around the windows, T-shaped floor plan, divided-lite double-hung wood windows, board and batten frame construction, and horizontal siding over the plank-framing construction.

ZFA's 2019 condition assessment concluded that overall, the Beatty House is in poor to fair condition. The doors and windows are boarded, and their frames are in fair condition. The exterior wood cladding is in fair to poor condition, showing signs of water damage, weathering, and discoloring. The porch is partially collapsed. The roof is in good condition but shows signs of exposure to humidity and water infiltration. The foundation sits on wood posts directly on the ground; moisture damage was observed where the posts rest on the ground.

In June 2019, Swaim Biological conducted a wildlife survey for the structure. Six *Myotis sp*. bats were observed roosting inside the building and eleven *Myotis sp.* bats were observed emerging from the structure. The Beatty Home is presumed to serve as a maternity roost. Woodrat signs were observed throughout the structure and three natural nests were observed outside.

Design Alternatives for the Structures

La Honda Creek Redwood Cabin
Alternative 1: Retain structure in current state

a) Exterior: install a chain-link fence around the structure; prune trees to keep limbs off the roof; remove two dead trees and weeds near the structure.
b) Utilities: decommission the power and utility lines serving the structure.

Engineer's estimate: $55,000 - price can be reduced if District staff performs the work. 20-year maintenance cost: $144,000. This estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 2: Stabilize the structure

a) Mothball the structure per Secretary of the Interior standards: board up and secure the structure's windows, doors, skylights, and openings/gaps; restrict access to the interior of the structure; provide passive ventilation to the interior; develop and implement a maintenance and monitoring plan.
b) Exterior: remove collapsed and unsafe portions of the porch framing, decking, and handrail – replace only what is necessary for ongoing maintenance of the structure; repair the roof for waterproofing; repair the chinking between the exterior logs for waterproofing and treating for insects.
c) Site preparation: prepare the subfloor and surrounding area for foundation repairs, stabilize the underside of the structure with wood box cribbing, remove shrubs and weeds adjacent to the structure, remove five trees that are either dead, growing at a heavy lean towards the structure, or unhealthy.
d) Wildlife management: pest control, preconstruction surveys for bats and woodrats prior to stabilization activities, removal of wildlife in the structure.

e) Utilities: disconnect and remove power, electrical panel, and plumbing

Engineer’s Estimate: $195,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. 20-year maintenance cost: $288,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 3: Repair and rehabilitate the structure for reuse

a) Exterior: either fully remove or replace deteriorated porch and railing (about 60% of the structure – see below for two options); repair the roof for waterproofing; repair the chinking between the exterior logs for waterproofing and treat for insects.
b) Foundation: remove and replace the lower three courses of horizontal logs on the exterior; lift the foundation back to its original level and pin the underside for stability; pour concrete footings for each post that extends into the ground.
c) Wildlife management: pest control, preconstruction surveys for bats and woodrats prior to stabilization activities; remove wildlife in the structure.
d) Interior finishes: remodel bathroom and kitchen for reuse.
e) Site utilities: install a new septic system; provide a safe drinking water source by verifying viability of existing water source for reuse or drilling for a new water source; replace interior plumbing and electrical.
f) ADA: construct an accessible path of travel from the parking area to the structure.

Engineer’s Estimate: $737,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. 20-year maintenance cost: $288,000. This estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

This option allows for a maximum occupancy of nine persons. It would completely rehabilitate the structure and conform to the Secretary of the Interior’s Standards and California Historic Building Code. The porch, railing, and deck surrounding the Redwood Cabin are character-defining features. There are two options to address their state of failure. The first is to repair all damaged portions, which has an engineer’s estimate of $67,793 (this is included in the engineer’s estimate for this design alternative). The second is to completely remove these items and block off access to the entrance they lead to, which has an engineer’s estimate of $14,737 (this is not included in the engineer’s estimate for this design alternative). There is a rear entrance that can be used to access the interior of the structure, so losing the front entry does not necessitate the construction of a new entrance.

Alternative 4: Remove the structure

a) Prior to removal, implement wildlife exclusion measures and conduct hazardous materials abatement (e.g. lead-based paint).
b) Demolish structure and recycle/salvage materials to the greatest extent possible consistent with the Waste Diversion Policy.
c) Restore footprint back to the natural environment.

Engineer’s estimate: $246,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. No 20-year maintenance cost.

The La Honda Creek Redwood Cabin Stabilization and Assessment project (MAA05-009) is part of Measure AA (MAA) Portfolio #05 - *La Honda Creek: Upper Area Recreation, Habitat Restoration and Conservation Grazing*.

La Honda Creek White Barn

Alternative 1: Retain structure in current state

a) Exterior: install a chain-link fence around the structure; remove weeds near the structure.

Engineer's estimate of $39,000 - price can be reduced if District staff performs the work.
20-year maintenance cost: $144,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 2: Stabilize the structure

a) Mothball the structure per Secretary of the Interior standards: board up and secure the windows, doors, and openings/gaps; restrict access to the interior; provide ventilation; develop and implement a maintenance and monitoring plan.
b) Exterior: repair deteriorated portions of the siding, doors, and windows; stabilize loose and peeling paint and repaint the exterior to help protect it from the elements and further reduce deterioration from weathering and ultraviolet radiation.
c) Foundation and floor: raise up deteriorated sections of floor and install pressure treated blocking to prevent further deterioration.
d) Wildlife management: conduct pest control; preconstruction surveys for bats and woodrats prior to stabilization activities; bat deterrence and exclusion as necessary; develop a bat habitat replacement plan; remove wildlife in the structure.
e) Site preparation: remove weeds adjacent to the structure.

Engineer's Estimate: $117,000; includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. 20-year maintenance cost: $288,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Access to the interior of the structure would be limited to District staff for maintenance activities. These maintenance activities are only for the maintenance of the structure. Utilizing the building for storage of items/materials is considered an occupancy per the Building Code; continuing to use the building in this manner would necessitate the requirements in Alternative #3.

Alternative 3: Repair and rehabilitate the structure for reuse

a) Exterior: repair all deteriorated elements of the siding (40% of the structure), doors, windows; replace elements that have deteriorated beyond repair; stabilize loose and peeling paint and repaint the exterior.
b) Foundation: new concrete foundation.
c) Floor and roof: new floor; new roof diaphragm.
d) Wildlife management: pest control; preconstruction surveys for bats and woodrats prior to stabilization activities; bat deterrence and exclusion; develop a bat habitat replacement plan; remove wildlife in the structure.
e) ADA: construct an accessible path of travel from the parking area to the residence.

Engineer's Estimate: $397,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. 20-year maintenance cost: $288,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 4: Remove the structure

a. Prior to removal, implement wildlife exclusion measures and conduct hazardous materials abatement (e.g. lead-based paint).
b. Demolish structure and recycle/salvage materials to the greatest extent possible consistent with the Waste Diversion Policy.
c. Restore footprint back to the natural environment.

Engineer's estimate: $172,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. No 20-year maintenance cost.

The La Honda Creek White Barn Structural Rehabilitation project is part of Measure AA Portfolio #05 (MAA05-008). The White Barn is currently used to house old equipment that was left over from the previous owner. The General Manager does not recommend Alternative #3 for the La Honda Creek White Barn because its improvements are excessive compared to the use of the structure. Monies would be more efficiently expensed under Alternative #2.

Sierra Azul Beatty Home

Alternative 1: Retain structure in current state

a. Exterior: install a chain-link fence around the structure; remove weeds near the structure.

Engineer's estimate: $64,000 - price can be reduced if District staff performs the work. 20-year maintenance cost: $144,000 estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 2: Stabilize the structure

a) Mothball the structure per Secretary of the Interior standards: board up and secure the structure's windows, doors, and openings/gaps; restrict interior access; provide ventilation; develop and implement a maintenance and monitoring plan.
b) Exterior: repair deteriorated portions of the siding, doors, and windows; remove dilapidated shed attached to the building; repair failed portions of the roof; replace in-kind character defining elements: siding, wood windows, and wood doors; stabilize loose and peeling paint and repaint the exterior.
c) Foundation and floor: raise up the deteriorated sections of floor and install pressure treated blocking to prevent further deterioration.
d) Wildlife management: pest control, preconstruction surveys for bats and woodrats prior to stabilization activities; bat deterrence and exclusion; develop bat habitat replacement plan; remove wildlife in the structure.
e) Site preparation: remove weeds adjacent to the structure.

Engineer's Estimate: $209,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. 20-year maintenance cost: $288,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

Alternative 3: Repair and rehabilitate structure for reuse - Not Recommended

a) Exterior: repair all deteriorated elements of the siding (40% of the structure), doors, windows; replace elements that have deteriorated beyond repair; stabilize loose and peeling paint and repaint the exterior; remove asbestos.
b) Foundation: new concrete foundation and footings; replace interior posts in the crawlspace framing; replace roof framing and install new stud wall framing on the perimeter wall.
c) Floor and roof: new floor; replace missing or damaged floor planking and framing hardware; new roof diaphragm.
d) Interior: kitchen and bathroom remodel.
e) Wildlife management: pest control; preconstruction surveys for bats and woodrats prior to stabilization activities; bat deterrence and exclusion; develop bat habitat replacement plan; remove wildlife in the structure.
f) Utilities: upgrade and reconnect plumbing and electrical services; new septic system; identify a viable potable water system.
g) ADA: construct an accessible path of travel from the parking area to the residence.

Engineer’s Estimate: $675,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup; ***does not*** include cost of providing a viable potable water system. 20-year maintenance cost: $288,000. Estimate assumes monthly/quarterly visits by two staff members to clear overgrown vegetation and check the exterior and interior of the structure for visual hazards.

This option allows for a maximum occupancy of five persons. It would completely rehabilitate the structure and conform to the Secretary of the Interior’s Standards and the California Historic Building Code. *However, this option may be infeasible due to lack of water supply for fire suppression and drinking water.* In 2011, the District investigated the two existing water wells at the Beatty property. The investigation concluded that the wells were not viable for potable water use. Well #1 was not constructed properly, does not meet American Waterworks Standards for wells, and the California Department of Public Health stated that it cannot be used for potable water. Well #2 did not meet water quality standards; its arsenic, aluminum, lead, and fluoride levels exceeded the maximum allowable limit. Well #2 also has a low potential to provide sufficient water quantity.

Municipal water does not serve the site; the nearest municipal water point of connection is near the intersection of Highway 17 and Alma Bridge Road (2.5 miles away from the site). There is a transmission water main along Alma Bridge Road, however water services cannot tap into the transmission main. A thorough water study would be required to determine if Alternative #3 is feasible for this site.

Municipal sanitary sewer service, through the West Valley Sanitation District, is not available at this site. In order to use municipal sanitary sewer service, the site would need to be annexed into the sewer district and a costly sanitary sewer main extension would be required. The installation of a septic tank is the recommended sanitary sewer treatment for this site.

Alternative 4: Remove the structure

a. Prior to removal, implement wildlife exclusion measures and conduct hazardous materials abatement (e.g. lead-based paint, asbestos abatement).
b. Demolish structure and recycle/salvage materials to the greatest extent possible consistent with the Waste Diversion Policy.

c. Restore footprint back to the natural environment.

Engineer’s estimate: $234,000 - includes construction labor and materials, testing and inspection, construction contingencies, and contractor markup. No 20-year maintenance cost.

The Beatty House is not specifically called out in Measure AA. Board selection of a design alterative for the Beatty House will be incorporated into the Beatty Parking Area and Trail Connections Project (MAA22-004), which is a separate project that is currently in early design and will be brought to the full Board at a later date. The Beatty Parking Area and Trail Connections Project will add approximately 1.3 miles of new multi-use trail and a new parking area to the Cathedral Oaks area of Sierra Azul Open Space Preserve.

FISCAL IMPACT

The adopted budget for fiscal year ending June 30, 2020 (FY20) includes $246,233 for the La Honda Creek Redwood Cabin Stabilization & Assessment project (MAA05-009), $216,214 for the La Honda Creek White Barn Structural Rehabilitation project (MAA05-0080), and $404,544 for the Beatty Parking Area & Trail Connections project (includes Beatty House). The recommended action has no direct fiscal impact at this time, however, future implementation activities will have a fiscal impact that are reflected in the cost estimates provided for each alternative. The FY20 budget includes sufficient funds to cover project costs through the end of the fiscal year. Funding for future years budgets will be proposed as part of the annual Budget and Action Plan process.

The Phase I budget covers the condition assessment and basis of design work; it does not include budget for the Phase II design development and construction support. To proceed with Phase II, additional funds will be needed to implement the Board-design alternatives for each structure:

- Develop construction drawings, specifications, revised cost estimates
- Procure permits
- Provide bid support and construction administration support
- Construction

The District will evaluate the best construction approach for each structure based on Board selection of the alternatives: design-build or design-bid-build.

A summary of the costs for each alternative is as follows:

Location	Costs	Alternative #1	Alternative #2	Alternative #3	Alternative #4
		Retain in Current State	Stabilize	Rehabilitation and Reuse	Removal
LHC Redwood Cabin (MAA05-009)	Design	-	$111,000	$254,000	-
	Construction	$55,000	$195,000***	$737,000***	$246,000***
	20-year Maintenance	$144,000	$288,000	$288,000	-
LHC White Barn (MAA05-008)	Design	-	$84,000	$129,000*	-
	Construction	$39,000	$117,000	$397,000	$172,000
	20-year Maintenance	$144,000	$288,000	$288,000	-
	Design	-	$98,000	$214,000	-

SA Beatty Home (MAA22-004)	Construction	$64,000	$209,000	$675,000**	$234,000
	20-year Maintenance	$144,000	$288,000	$288,000	-

**Option not recommended by General Manager*
*** Cost for a viable potable water system not included*
**** Cost of bridge evaluation, potential repair, and old bridge demolition not included*

The design for Alternatives #1 and #4 would be performed in-house. Design costs for all alternatives do not include permit costs, which are unknown at this time.

Design fees for existing and historic structures are typically higher than design fees for new construction. This is due to the challenges associated with operating within the constraints of existing structures, unknown field conditions, and additional regulatory requirements.

The District has received funding and assistance from granting agencies and public/private partnerships to complete prior historic preservation projects. If Alternative #3 is selected for any of these structures, at the Board's direction, staff can seek partnerships with local public agencies, private organizations, or non-profit groups to aid the completion of the Project. To date, however, there have been no known interested parties willing to donate funds for these structures. If partnerships are explored, District staff would anticipate this work to take approximately one year to solicit interest, identify any potential donors, and return to the Board with a funding agreement.

The following table outlines the Measure AA Portfolio #5 La Honda Creek: Upper Area Recreation, Habitat Restoration and Conservation Grazing allocation, costs-to-date, and encumbrances. The fiscal impact related to the La Honda Creek Redwood Cabin Stabilization and Assessment (MAA05-009) and the La Honda Creek White Barn Structural Rehabilitation (MAA05-008) projects will be presented after alternatives are selected.

MAA05 La Honda Creek: Upper Area Recreation, Habitat Restoration and Conservation Grazing:	**$11,733,000**
Life-to-Date Spent (as of 2/19/2020):	($2,545,299)
Encumbrances:	($32,287)
Portfolio Balance Remaining (Proposed):	**$9,155,414**

The following table outlines the Measure AA Portfolio #22 Sierra Azul: Cathedral Oaks Public Access and Conservation Projects allocation, costs-to-date, and encumbrances. The fiscal impact related to Beatty Parking Area and Trail Connections (MAA22-004) project will be presented after alternatives are selected.

MAA22 Sierra Azul: Cathedral Oaks Public Access and Conservation Projects:	**$6,717,000**
Life-to-Date Spent (as of 2/19/2020):	($1,191,045)
Encumbrances:	($223,892)
Portfolio Balance Remaining (Proposed):	**$5,302,063**

BOARD COMMITTEE REVIEW

The Board approved the assessment of the three structures and exploration of different preservation and stabilization alternative at the May 15, 2019 regular meeting and authorized the General Manager to enter into a contract with ZFA to prepare a Basis of Design (R-19-63).

PUBLIC NOTICE

Public notice of this Agenda Item was provided as required by the Brown Act.

CEQA COMPLIANCE

Review of design alternatives is not subject to the California Environmental Quality Act. Refer to Board report R-19-51 from the April 24, 2019 Board meeting for further information on CEQA compliance. Appropriate CEQA review will be conducted for any project selected by the Board.

NEXT STEPS

Based on the design alternative selected for each structure, the General Manager will return to the Board with a recommended contract amendment with ZFA to provide design development, permit procurement, bidding support, contractor selection, and construction support services.

Attachments:

1. La Honda Creek Redwood Cabin Basis of Design, Condition Assessment, and Estimate – ZFA December 2019
2. La Honda Creek White Barn Basis of Design, Condition Assessment, and Estimate – ZFA December 2019
3. Beatty Home Basis of Design, Condition Assessment, and Estimate – ZFA December 2019
4. Renderings of La Honda Creek Redwood Cabin design alternatives
5. Renderings of La Honda Creek White Barn design alternatives
6. Renderings of Beatty Home design alternatives

Responsible Department Head:
Jason Lin, Engineering & Construction Department Manager

Prepared by:
Tanisha Werner, Senior Capital Project Manager, Engineering & Construction Department

Attachment 1

ZFA STRUCTURAL ENGINEERS

REDWOOD CABIN

Structure Stabilization Basis of Design

Midpeninsula Regional Open Space District
La Honda Creek Open Space Preserve, San Mateo County, California
District Project Number: MAA05-009

March 13, 2020

Prepared For:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Prepared By:

Steven Patton, SE, Senior Associate
Matt Frantz, SE, Associate Principal
Mark Moore, SE, Principal-in-Charge

TABLE OF CONTENTS

EXHIBITS

Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
Exhibit C: *Geotechnical Investigation* by Romig Engineers
Exhibit D: *Asbestos and Lead Survey* by Terracon Consultants, Inc.
Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
Exhibit F: *Topographic Site Plan* by Sigma Prime Geosciences, Inc.
Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
Exhibit H: *Arborist Report* by Kielty Arborist Services LLC
Exhibit I: *Conceptual Cost Estimate* by OCMI

BASIS OF DESIGN SUMMARY

Introduction

The Redwood Cabin (also referred to as the Pauline Cabin) is located in a remote and forested area approximately 1/4 mile from Skyline Boulevard in the La Honda Creek Open Space Preserve and is owned by Midpeninsula Regional Open Space District (District). The Redwood Cabin is a one-story, rectangular, redwood log-framed structure that was previously used as a recreational retreat. The building was originally constructed in 1928. Multiple phases of strengthening or repair renovations to the building appear to have occurred since the time of original construction.

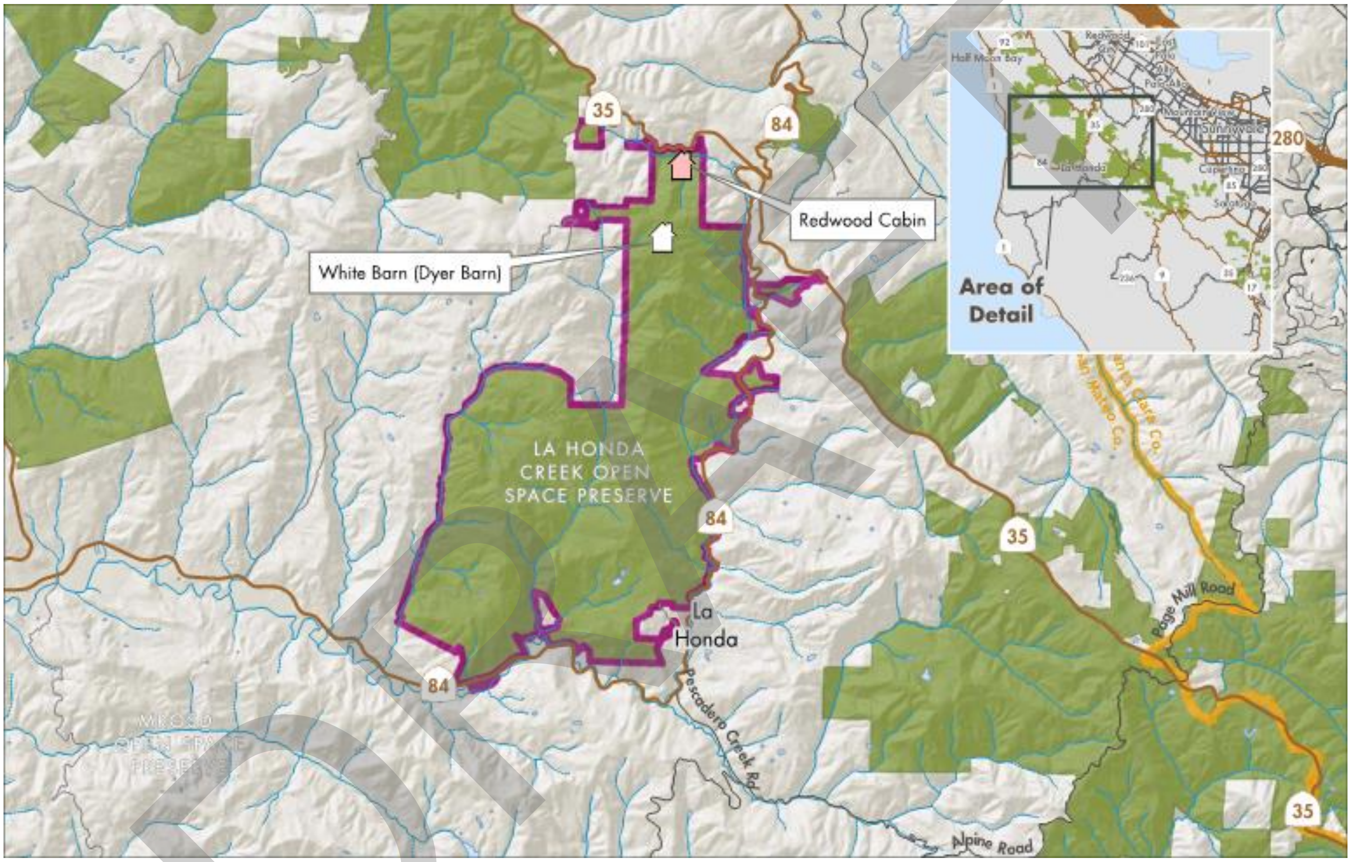


Figure 1. Project Area Map

The interior of the Redwood Cabin contains a large stone fireplace in its living room, two small bedrooms, a bathroom, and a kitchen. The exterior of the cabin consists of redwood logs, timber roof framing, a continuous deck around the perimeter, and hinged windows, skylights, and doors. The building has not previously been evaluated for historic status, but is assumed to be an historic resource and is eligible for individual inclusion in the National Register and California Register of Historic Places.

The District has initiated a project to assess the Redwood Cabin, along with the La Honda Creek White Barn and Beatty Property Home. The project is being performed in two phases:

- Phase 1: Site reconnaissance and structure assessment
- Phase 2: Improvement selection and construction documents

This report summarizes the findings and recommendations from the Phase 1 tasks including an assessment of the existing conditions, Basis of Design, conceptual design options and cost estimates. The proposed options include:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a retreat space, meeting space, or hikers hut.
4. **Remove the structure** and restore the underlying natural resource values.

Each alternative can include interpretive signage if or once the site is accessible to the public.

Consultants and Exhibits

The findings and recommendations contained in this summary are based on the following reports, which are provided as Exhibits:

- Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
- Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
- Exhibit C: *Geotechnical Investigation* by Romig Engineers
- Exhibit D: *Asbestos and Lead Survey* by Terracon Consultants, Inc.
- Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
- Exhibit F: *Topographic Site Plan* by Sigma Prime Geosciences, Inc.
- Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
- Exhibit H: *Arborist Report* by Kielty Arborist Services LLC
- Exhibit I: *Conceptual Cost Estimate* by OCMI

Permitting Agency

The permitting agency for this building is the County of San Mateo Planning and Building Department (County). A preliminary coordination meeting was performed with the County to discuss the project. The County requested that a follow-up meeting be held once an alternative is selected by the District. In addition, the County of San Mateo Historic Resource Planner stated that the proposed alternative must be reviewed and approved by the County's Historic Resources Advisory Board (HRAB). The County did not provide definitive guidance on the permitting schedule as this is dependent on the selected option, but the permitting and review schedule is expected to increase along with the scope of rehabilitation. For instance, the County stated that installation of a fence could likely be approved with an over-the-counter review, whereas rehabilitation for occupancy of the interior of the building would require a formal submittal review process. Demolition of the building or any significant alterations to the historic fabric would require greater review time by the HRAB.

Regulatory Requirements

The following regulatory contexts, summarized here from Exhibit A, were investigated and considered for this building:

- National Register of Historic Places
    - The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. An evaluation of historic status has not been performed, but, based on the era of construction, the Redwood Cabin is assumed to be eligible for the National Register.

- California Register of Historic Resources
    - The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. An evaluation of historic status has not been performed, but, based on the era of construction, the Redwood Cabin is assumed to be eligible for the California Register.
- Secretary Of The Interior's *Standards*
    - *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Standards*) establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The *Standards* and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources.

Governing Building Code

Since the building is presumed to be eligible for the National and California Registers, the *California Historical Building Code* (CHBC - Part 8 of the California Code of Regulations, Title 24) is presumed to be the governing building code. As discussed in Exhibit A, the CHBC provides performance-oriented, rather than prescriptive provisions, for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources. The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all.

If the California Existing Building Code (CEBC) were to be utilized in lieu of the California Historic Building Code, the required modifications to the structural stabilization design, as described in Alternative 3 below, could include the following: steel rod bracing instead of wood bracing, the addition of vertical steel dowels drilled through the stacked log-framed walls, additional clips and fasteners from the roof to wall framing and from the wall to floor framing, the addition of diagonal bracing at the top of interior partial height log-framed walls, and the addition of plywood overlay at the roof and floor. These modifications would likely affect the character-defining features of the building. An Historic Resource Evaluation is required to be performed to confirm the historical status of the building. If the building is confirmed to not be an historic resource, the structural stabilization design will be based on the CEBC. If the building is confirmed to be an historic resource, the structural stabilization design will be based on the CHBC.

Architectural Condition Assessment

The results of the architectural conditions assessment, detailed in Exhibit A, are summarized below.

Windows

The windows are generally in good condition. On the northern façade, the differential settlement of the cabin has caused the window frames to be out of square and out of plane with the window sash. All windows are covered up from the exterior with metal screens to mitigate foreign intrusions, with the exception of the kitchen window facing west, which is boarded up on the outside. There are five (5) skylight windows along the eastern side of the roof. One of the skylights has been broken, likely due to a falling object, and the location has been covered from the exterior with plywood.

Exterior Doors

The primary entry door is in generally good condition. The door is solid wood approximately two-inches thick and doesn't have signs of major weathering or insect related deterioration. The door frame is in overall fair condition, however the bottoms of the jambs are in poor condition, having lost material to rot and insect activity. The operation of the door is fair, as its in-swing collides with the floor preventing it from opening more than 60 degrees, which may be caused by building settlement or hinge deformation. The secondary entry doors exhibit a variety of conditions from good to poor.

Wood Posts

The entire cabin is supported by a system of wood posts, some of which are set into or bear directly on the ground, while others are set on concrete bases. All of the posts display varying degrees of moisture and humidity saturation, as well as signs of rot and insect attacks. The posts set into the ground are in poor condition while the ones set on concrete bases are in fair condition.

Roofing

The wood shingle roof is partially covered by branches, leaves and other debris rendering impossible an effective visual assessment of its current state. Nonetheless, the roof appears to be in good to fair condition, however a slight slope toward the north where the building is settling was observed, and there is slight sagging along the ridgeline of the roof between the king post trusses. The shingles, where visible, appear to be in fair condition. At the eaves, the shingles are splitting, and the resulting inadequate water shedding likely contributes to the deterioration of the exposed rafter tails.

Log Walls/Framing

The walls of the structure are framed with second or third-growth Redwood logs. The log walls are in good to fair condition overall, while the exposed ends of the logs are in fair to poor condition, with more deterioration generally observed closer to the base of the wall. Several logs show some discoloration from humidity and rot, as well as holes from insect activity. The settlement at the northwest side of the building has caused displacement of the logs forming the northern wall, particularly within the gable.

Porches

Where it is still standing, the deck of the porches is in fair condition in general, however rot and unstable foundations have caused the porch to collapse in a few locations. A substantial portion of the northwest corner of the porch has collapsed, apparently due to a combination of factors including tree growth, ground movement, and deterioration of the wood members of the porch itself. An area of decking on the southern side of the porch has also collapsed, most likely due to rot.

Several sections of the perimeter railing in the Eastern section of the porch are missing or have pieces that have collapsed. Portions of the railing have also failed in the South and North section where the decking and structure have collapsed. There's evidence of insect attacks in several places. The railings in general are in fair to poor conditions. Based on our preliminary evaluation, the railing does not comply with current California Building Code requirements.

Stairs

The stairs are in fair to poor condition; while currently sufficiently stable to be walked on, it is evident that the effects of humidity, biological growth, and insects will shortly render the stairs unsafe if maintenance and repairs are not undertaken.

Chimney

The massive stone chimney begins at the ground below the cabin, rises through the center of the cabin, and terminates above the roof. The exterior sections of the chimney appears to be in generally good condition, with some minor exfoliation of the sandstone base and some minor cracking.

Above the roof, the flashing installed between the chimney and the roofing appears to be displaced, with many open joints that may be allowing water to penetrate the roof around the chimney. The flashing and roof around the chimney should be inspected and repaired as part of mothballing, stabilization or rehabilitation efforts.

Ventilation pipes and utilities connections

Most of the utility connections are in fair to poor condition. Utility penetrations do not appear to have waterproofing, allowing rainwater to filter through these openings into the various wood elements; as the wood surrounding the penetration deteriorates, it provides an opening for rodents and insects to enter the building. The condition of ventilation pipe penetrations through the roof could not be visually assessed due to the accumulation of organic debris on the roof.

Formal assessment of the electrical service to the Redwood Cabin was outside the scope of this survey and analysis, however some general observations were made of the existing system. Electrical outlets were observed adjacent to the floor, with conduit penetrating directly through the floor. Surface-mounted knob-and-tube electrical wiring was observed running along the top of the log walls and along the bottom cords of the trusses to provide power to hanging light fixtures. A general connection box was observed on the south façade, and appears to be disconnected from power supply, however there does appear to be power supply to the site that could likely be reconnected if the building were rehabilitated for occupation.

Interior Floors

The general floor of the interior is in good condition, being stable and without signs of deterioration, although it has a general slight slope towards the north side of the building. The linoleum floors in the kitchen and bathroom are in poor condition and exhibit significant wear and age-related deterioration.

Interior Doors

The interior doors are of similar construction that appear to have been designed with the cabin and are in good condition. In some locations on the northwest side of the building, settlement has caused racking of the door frames (i.e. the frames are out of plumb), and they would need to be squared as part of a rehabilitation effort to allow occupancy.

Roof Trusses

The roof-supporting king post wood trusses and the roof framing appear to be in good condition, free from signs of rot, insect attack, or displacement.

Roof Framing

The roof framing between the trusses appears to be in good condition as viewed from the underside, displaying no signs of weathering or deterioration except for some signs of moisture in areas around roof penetrations like pipes and chimneys.

Log Framing

The perimeter walls of the cabin are exposed second or third-growth Redwood log framing. The interior of the cabin is divided into four primary sections through the intersection of three log walls: a north and a south transverse wall, and a longitudinal wall running between them behind the chimney on the western side of the cabin. The longitudinal wall behind the chimney shows signs of settlement where the mortar between the logs and the stone has gaps of up to one inch. Based on the way the mortar has broken and displaced, it appears that the logs are what have settled, rather than the chimney.

The interior face of the perimeter log wall shows signs of insect infestation activity, particularly along the south wall in the area of the dining room and kitchen, and the gable logs have displaced, similarly to the north side.

Hearth, Fireplace and Chimney

The chimney is formed by coarse, rounded stones set with mortar. The chimney is in generally fair condition, however several significant cracks were observed, especially one that runs vertically up the center of the chimney through several stones. There's a metal lintel of the firebox which aids in transmitting the loads to the sides of the opening, and which is also presumably responsible for the crack not widening further. Water staining at the back of the firebox was observed below the flue, indicating insufficient protection from moisture at the top of the chimney. Several bricks at the back of the firebox were also cracked and spalled, which could be due to a combination of compression, moisture, and heat. The hearth is formed of cast-in-place concrete that is flush with the adjacent floor.

Structural Condition Assessment

The results of the structural condition assessment are detailed in the report in Exhibit B. The structural assessment includes a review of the existing materials conditions as well as the expected performance of the structure under seismic and gravity loading.

Overview

The structure appeared to be in generally poor to fair structural condition with obvious structural damage or deterioration apparent.

Roof Framing

The roof is composed of shake shingles supported directly on 1x horizontal lumber decking oriented up-down slope that forms the roof diaphragm. The 1x decking is supported by 1x framing at approximately 24" on center which spans between the roof rafters. The roof rafters are 3x6 nominal spaced approximately 30" on center and clear span from the ridge to the exterior walls (see photo 12). There are 4 timber trusses spaced between 12 to 14 feet on center on the interior of the building. The building's exterior log-framed walls are serving as bearing walls directly supporting the truss and roof rafters which are notched to bear directly on the walls. The roof framing was observed to be in generally good condition.

Walls

Walls above the ground floor are typically framed with horizontally stacked redwood logs varying in diameter from 6"-12". A wood dowel was observed in one location interconnecting the stacked logs, it is assumed these dowels occur at each end of any individual log, though the spacing and quantity of dowels used could not be determined without localized destructive testing. There are interior non-bearing partition walls at multiple locations which are typically framed with 1x lumber planks spanning vertically from floor to top of wall. The interior of the log walls appeared to be in good condition except for evidence of settlement and shrinkage. The exterior walls appear to have significant amounts of rot and decay, particularly at the building's corners at the ends of the logs.

Floor Framing

At the ground floor level, the flooring is composed of horizontal wood flooring directly over 1x8 diagonal lumber sheathing which serves as the buildings floor diaphragm. The sheathing is supported by 4x6 floor joists spaced at 24" on center. No blocking or hardware was observed between the joists and girders. The floor framing was observed to be in fair condition throughout.

Porch Framing

A wrap-around porch exists around the full perimeter of the building. Portions of the north, west and south edges of the existing deck have fully or partially collapsed areas. The Eastern portion of the deck is framed with modern pressure treated sawn lumber materials indicating it is of more recent construction and appears to be in near serviceable condition. Many of the deck's railings have failed, are rotted or are missing, and all are non-compliant with current code regulations.

Foundations

Foundations are generally vertical log poles embedded an unknown distance into existing grade. At select locations at the building's perimeter, shallow concrete spread footings can be observed and are likely a result of previous repairs made to the building. Reinforcing in existing concrete footings is unknown though no large cracks or substantial settlement was observed indicating they are likely in serviceable condition. Ground was observed to be in contact with approximately 40 existing log pole elements, which has caused deterioration in the logs. The most severe rot was observed in the perimeter poles that were not modified to have a concrete footing.

Seismic Force-Resisting System

The lateral system of the building is not a "codified" system identified under the current building code. The horizontal lumber roof diaphragm transmits roof horizontal loads to the log walls below, which serve as de-facto shear walls. Perimeter walls and two interior transverse walls are present as lateral force-resisting elements. The diagonal lumber floor diaphragm transmits loads to the diagonal bracing at the cripple wall level below. The lateral framing below the ground floor (crawl space) is composed of irregularly spaced 2x wood bracing that does not appear to be of original construction. The bases of all posts set into grade and show signs of decay and rot in the lower 12" of the poles.

A Tier 1 assessment of the structure using ASCE 41-17 *Seismic Evaluation and Retrofit of Existing Buildings* identified sixteen (16) potential deficiencies including the lack of a complete and well-defined seismic force-resisting system and the presence of a weak or soft story condition because of the unbraced foundation poles in the crawl space.

Geotechnical Investigation

A geotechnical investigation report has been prepared by Romig Engineers (Exhibit C). Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- Varying depth to competent bearing material ranging from 2 feet to 4 feet is anticipated across the structure (page 3).
- The unknown depth of embedment and construction materials used to embed the redwood posts/foundations (page 8).
- The remote location and limited access within the crawlspace for construction of uplift resisting elements (page 8).
- The history of land sliding observed and mapped upslope of the site. However, the immediate slopes and building area of the cabin appear to be relatively stable (page 8).
- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 6).

The bottom of all footing excavations should be cleaned of loose and soft soil and debris. A member of our staff should observe the excavations to confirm that they have at least the minimum recommended dimensions, are founded in competent residual soil or bedrock, and have been properly cleaned prior to placing concrete forms and reinforcing steel. If existing fill soil, colluvial soil, or disturbed bedrock is encountered at the foundation bearing depth, our field representative will require these materials to be removed and a deeper embedment depth before reinforcing steel is placed.

Hazardous Materials Survey

An Asbestos and Lead Survey was performed by Terracon, which is documented in the report in Exhibit D. In summary, no asbestos containing materials were detected in the tested materials. Lead-containing paint was confirmed in the building and is the only hazardous material identified. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.

Archaeological Survey

An archaeological survey is not required for all Alternatives and was therefore not included in this Assessment. An archaeological survey would only be performed for Alternatives 3 and 4. Should these options be selected, the survey would be performed concurrent with the documentation for that phase.

Arborist Report

Based on the investigation performed by Kielty Arborist Services, which is in Exhibit H, the primary arborist concerns at the site are falling hazards and removal or maintenance of select existing trees. Three Tan Oak trees and two Madrone trees are in poor condition and removal of all five trees is recommended. Cabling of codominant redwood trees is also recommended as well as the removal of girdles restricting the trunk of two redwood trees. Recommendations for protection of trees during access and construction on the site are included in the report.

Wildlife Survey

A wildlife survey was performed by Swaim Biological, Incorporated, on June 17 and June 26, 2019, which is in Exhibit E, to identify special status mammal species in and around the building. The cabin provides suitable bat roost habitat outside and within the cabin with multiple entry points. Moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. While no bats or signs were observed within or outside the cabin, there is still potential of bat roosting given the available habitat outside and within the cabin. Signs of woodrats were present throughout the structure; however no natural nests were observed outside of the structure. The riparian habitat near the structure provides moderately to highly suitable habitat and may become occupied by woodrats prior to project work.

Recommendations to address the presence of wildlife include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1 of SBI's report. The bat wintering period is generally from November 16 through February 15, no building or tree work should be conducted during this time if bats are present.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2 of SBI's report.
- Nesting bird surveys are required if work takes place between February 15 and August 30.

Site Access Constraints

The following items were considered when developing cost estimates for BOD alternatives and should be considered for future planning of repairs and maintenance for the Redwood Cabin:

- Shared Driveway – Access to the site requires a district permit, travel through two locked gates and over two bridges with unknown load carrying capacities. The final portion of the site access road is rough and unpaved and requires a four-wheel drive vehicle or access by foot. Additional limitations on vehicular access is anticipated during wet seasons and times of year when sensitive species may be present. Access should be assumed to be limited to vehicles no heavier than a half-ton pickup without a detailed assessment of the bridges condition and load carrying capacity. For significant construction projects, such as BOD Alternative 3, further assessment or proof load testing of the bridges to support fire trucks may be required. Observations of the one of the timber bridges identified dated tags on the pressure-treated framing dating to 1998, which indicates that the bridge may have been replaced or repaired less than 20 years ago and is likely in serviceable condition.
- Quarantine area for Slender False Brome –Personnel and visitors to the site are required to adhere to District guidelines, including biological training to limit the spread of the invasive species.
- Wildlife Habitat – The presence of protected species in the area requires that personnel and visitors to the site follow District guidelines and advisory documents for access. District access permits are required for this site. Bird nesting season is February 15 to August 30. Bat maternity season is from April 15 to August 31. Torpor season is from November 15 to February 15. Construction restrictions will be in effect for these times. A biological monitor is required to be present during the first phases of construction or demolition to ensure bats are not harmed. Exclusion may also be warranted depending on the type of work taking place.

Design Alternatives

Based on the current observable condition of the structure, as described above, the building's structural integrity is compromised, and multiple safety hazards are present. Access to the building and its proximity should be limited to District staff and consultants only until one of the following alternatives is implemented.

Four alternatives are explored to address the existing condition of the structure, which range from minimal work with restricted public access to a complete rehabilitation to allow for re-occupancy. Demolition is also explored as an option. Cost estimates have been developed for each option to assist the District with decision making.

Alternative 1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

Recommendations:

- Install a secure chain-link fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.
- Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).
- Additional factors may need to be considered regarding the recommended lifespan of this option.

The estimated cost for Alternative 1 is **$54,250**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

The recommended stabilization methods specifically target only the gravity related structural deficiencies and would not allow for re-occupancy of the building. The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.

Recommendations:

- Install pressure treated wood cribbing for shoring at all locations indicated on foundation plan for Alternative 2.
- All failed or failing portions of the existing porch framing and railings (assume north, west and south ends) should be repaired or demolished and replaced in-kind.
- If it's not desirable for the perimeter access to the site to be fenced in per Atlernative 1, it is recommended that all 25 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.
- Follow the *Mothballing Guidelines* outlined in Exhibit G, including:
    a. Secure the building and its component features to reduce vandalism or break-ins.
    b. Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
    c. Provide adequate ventilation to the interior.
    d. Secure or modify utilities and mechanical systems.

e. Develop and implement a maintenance and monitoring plan for protection.

- Secretary of the Interior's *Standards* are the most appropriate basis for this proposed project alternative.
- Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.
- The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.
- The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.
- Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Atlernative 2 is **$194,501**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 3: Repair and rehabilitate the structure for reuse as a retreat space, meeting space, or hikers hut.

Recommendations:

- While the Redwood Cabin is currently unoccupied, the Basis of Design assumed that the current occupancy is classified as Residential with a maximum occupancy of nine (9) people.
- Secretary of the Interior's *Standards* are the most appropriate basis for this proposed project alternative.
- Replace deteriorated portions of the existing porch and railing framing (assume 60%) in conformance with strength and attachment requirements of 2016 CBC Section 1607.8.
- Complete replacement of select rotted timbers. Assume the lower three courses of horizontal logs in all exterior walls as well as 48" from the ends of all corner logs. Assume shoring and underpinning is required for this option.
- The settled portion of the structure should be underpinned and lifted as close as possible back to its original (level) position. The cribbed shoring recommended for Atlernative 2 may be used as lifting points for jacking operations. New 36" square by 42" deep concrete spread footings should be installed below all existing timber posts that are currently resting directly on grade. The existing rotted ends of all existing posts should be trimmed to remove deteriorated material (up to 12" maximum) above existing grade and treated or sealed to limit further decay prior to installation of new pad footings. Positive anchorages shall be cast into the footings to connect to the log poles with galvanized steel base plates with knife plates and anchor bolts. A combination of compact light excavation equipment and hand digging should be assumed necessary for installation of new foundation elements.
- Install new 6x posts at interior face of log walls spaced at 8 feet on center.
- Provide continuous foundation tie beams in line with 4x10 pressure treated timber brace elements in the crawls space between existing support posts ((8) locations).
- Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.
- The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

- The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.
- Improve accessibility to allow vehicular access to the southwest corner of the building or develop a switch-backed ramp in the landscape on the southeastern side of the building.
- Modify the door at the southwest corner of the building to provide the necessary width and door hardware.
- In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Alternative 2, the following work should be anticipated for cost estimation purposes:
    a. Upgrade and reconnect plumbing and electrical service.
    b. Verify safety of consumption of the existing source of water at the site. Assume construction of new septic system and potable water system. It is assumed the existing water source can be utilized. Per County records, the existing septic tank has been demolished.
    c. Provide new flooring toilet, lavatory, and shower/bath in bathroom.
    d. Provide new cabinetry, sink, fixtures, oven and stove in kitchen.
    e. Restore the existing antique stove including replacement of flu and roof penetration repairs.
    f. The floors are assumed to require repair in areas where there has been rodent habitation or water intrusion, and gentle refinishing is assumed to be required throughout.
- Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.
- Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.
- Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Alternative 3 is **$736,793**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 4: Remove the structure and restore the underlying natural resource values.

Recommendations:

- Demolishing the structure may require additional processes to obtain demolition permits.
- Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.
- The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.
- Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

The estimated cost for Alternative 4 is **$245,869**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I.

EXHIBIT A

Architectural Basis of Design and Alternative Evaluations

By Page & Turnbull, Inc.

TABLE OF CONTENTS

INTRODUCTION

The purpose of this section of the Basis of Design report is to evaluate the existing architectural conditions and the potential impacts and implications of the Redwood Cabin in the La Honda Creek Open Space Preserve. The four proposed project alternatives/treatments are generally stated as follows:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a retreat space, meeting space, or hikers hut.
4. **Remove the structure** and restore the underlying natural resource values.

METHODOLOGY

To evaluate the existing conditions of the three subject buildings, Page & Turnbull conducted visual conditions assessments and documented the existing conditions with digital photography. The conditions were evaluated based on the following rating system of good, fair, and poor conditions:

Good (G)
The building element / feature is intact, structurally sound, and performing its intended purpose. The element / feature needs no repair or rehabilitation, but only routine or preventative maintenance.

Fair (F)
The building element / feature shows signs of aging and one or more of the following conditions is present:

a) There are early signs of wear, failure, or deterioration though the element / feature and its components are generally structurally sound and performing their intended purpose; or

b) There is failure of one individual component.

Poor (P)
The building element / feature shows signs of deterioration and one or more the following conditions is present:

a) The element / feature is no longer performing its intended purpose; or
b) Feature is missing; or
c) Deterioration or damage affects more than 30% of the element / feature; or
d) The element / feature shows signs of imminent failure or breakdown.

Unknown (U)
The element / feature was not accessible for assessment or not enough information is available to make an evaluation.

Evaluation of the proposed project alternatives took into account the presumed historic significance of the Redwood Cabin, and the applicable preservation principles and context, including the Secretary of the Interior's Standards for the Treatment of Historic Properties, the 2016 California Building Code, the 2016 California Existing Building Code, and the 2016 California Historical Building Code.

Evaluation of the structural conditions and recommendations for the remediation of structural deficiencies was performed by ZFA. Refer to the assessment report and treatment recommendations produced by ZFA for all structural considerations and impacts.

GUIDING PRESERVATION PRINCIPLES AND CONTEXT

The following section describes the preservation principles and context that are applicable to the La Honda Creek Redwood Cabin. For analysis and considerations related to the California Environmental Quality Act (CEQA) as it may apply to the proposed project alternatives, additional studies may need to be performed.

THE NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Typically, resources over fifty years of age are eligible for listing in the National Register if they meet any one of the four criteria of significance and if they sufficiently retain historic integrity. However, resources under fifty years of age can be determined eligible if it can be demonstrated that they are of "exceptional importance," or if they are contributors to a potential historic district. National Register criteria are defined in depth in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*. There are four basic criteria under which a structure, site, building, district, or object can be considered eligible for listing in the National Register.

Criteria

Criterion A (Event): Properties associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B (Person): Properties associated with the lives of persons significant in our past;

Criterion C (Design/Construction): Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components lack individual distinction; and

Criterion D (Information Potential): Properties that have yielded, or may be likely to yield, information important in prehistory or history.

Integrity

Once a resource has been identified as being potentially eligible for listing in the National Register, its historic integrity must be evaluated. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity. These aspects are location, design, setting, materials, workmanship, feeling and association.

Location is the place where the historic property was constructed or the place where the historic event occurred;

Setting addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s);

Design is the combination of elements that create the form, plan, space, structure, and style of the property;

Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form the historic property;

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;

Feeling is the property's expression of the aesthetic or historic sense of a particular period of time; and

Association is the direct link between an important historic event or person and the historic property.

In order to be determined eligible for listing, these aspects must closely relate to the resource's significance and must be intact.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places.

In order for a property to be eligible for listing in the California Register, it must be found significant under one or more of the following criteria.

Criteria

Criterion 1 (Events): Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2 (Persons): Resources that are associated with the lives of persons important to local, California, or national history.

Criterion 3 (Architecture): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

Criterion 4 (Information Potential): Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

Resources eligible for the National Register are automatically listed in the California Register of Historical Resources.

Integrity

The process of determining integrity is similar for both the California Register and the National Register. The same seven variables or aspects that define integrity—location, design, setting, materials, workmanship, feeling and association—are used to evaluate a resource's eligibility for listing in the California Register and the National Register. There is a critical distinction between the two registers, however, and that is the degree of integrity that a property can retain and still be considered eligible for listing. According to the California Office of Historic Preservation:

It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the National Register, but they may still be eligible for listing in the California Register. A resource that has lost its

historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant or historical information or specific data.[1]

SECRETARY OF THE INTERIOR'S STANDARDS

The Secretary of the Interior's Standards for the Treatment of Historic Properties (hereafter "*Standards*") establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The Standards and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources. The *Standards* define four approaches to the treatment of historic properties, adapted below. A variety of factors contribute to the selection of an appropriate treatment, including the historic significance, physical condition, proposed use, and intended interpretation of the subject properties.

Preservation:

Focuses on the maintenance and repair of existing historic materials. Requires retention of the greatest amount of historic fabric, along with the building's historic form, features, and detailing as they have evolved over time. When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment.

Rehabilitation:

Acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character. When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment.

Restoration:

Allow for the depiction of a building at a particular time in its history by preserving materials from the period of significance and removing materials from other periods. When the property's design, architectural, or historical significance during a particular period of time outweighs the potential loss of extant materials, features, spaces, and finishes that characterize other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned, Restoration may be considered as a treatment.

Reconstruction:

Establish a limited framework for re-creating a vanished or non-surviving building with new materials, primarily for interpretive purposes. When a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction, Reconstruction may be considered as a treatment.

Once a treatment option has been established, an associated set of standards are applied. In addition to the *Standards*, the Secretary of the Interior publishes guidelines with specific examples to aid in interpreting how the standards are applied. For the purposes of this Basis of Design, the treatment approaches most appropriate to the four proposed project alternatives are Preservation and Rehabilitation.

[1] California Office of Historic Preservation, *Technical Assistance Series No. 6, California Register and National Register: A Comparison* (Sacramento, CA: California Office of State Publishing, November 2004)

Standards for Preservation:

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standards for Rehabilitation*

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

*For the *Historic Preservation Tax Incentives Program*, there is a similar but distinct set of standards.

Further discussion of the appropriate treatment options for the La Honda Creek Redwood Cabin can be found in the following sections of this Basis of Design Report.

CALIFORNIA HISTORICAL BUILDING CODE

The California Historical Building Code is Part 8 of the California Building Standards Code (California Code of Regulations, Title 24). The code provides performance-oriented rather than prescriptive provisions for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources.[2] The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all. From Section 8-101.2, Purpose:

> *The purpose of the CHBC is to provide regulations for the preservation, restoration, rehabilitation, relocation, or reconstruction of buildings or properties designated as qualified historical buildings or properties (Chapter 8-2). The CHBC is intended to provide solutions for the preservation of qualified historical buildings or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to preservation, and to provide for the reasonable safety of the occupants or users. The CHBC requires enforcing agencies to accept solutions that are reasonably equivalent to the regular code (as defined in Chapter 8-2) when dealing with qualified historical buildings or properties.*

Generally, qualified historical buildings may continue to be used as they were historically unless the continued use or occupancy constitutes a distinct hazard to life safety as defined in the CHBC.[3] For a change in occupancy, e.g. in the case of a rehabilitation or adaptive use, the property may need to be adapted to conform with the applicable requirements of its new use as defined in the CHBC.[4] The Redwood Cabin is age-eligible for evaluation as an historic resource, but at the time of writing this report, a formal Historic Resource Evaluation has not been completed for the building. If in the future the Redwood Cabin is determined to be an historic resource, the CHBC may be applied.

CALIFORNIA EXISTING BUILDING CODE

For existing buildings not designated as historic resources, the provisions of the California Existing Building Code (CEBC) apply to their repair, alteration, change of occupancy, addition, and relocation.[5] Per the 2016 CEBC, Section 101.3, the intent of the code is to "provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition, and relocation of existing buildings." As the Redwood Cabin is an existing building that has not yet been evaluated for historical significance, the CEBC may be used where applicable.

[2] California Historical Building Code, 2016, vii.
[3] 2016 California Historical Building Code, Section 8-102.1.4.
[4] 2016 California Historical Building Code, Section 8-302.2.
[5] 2016 California Existing Building Code, Section 101.2

LA HONDA CREEK REDWOOD CABIN

CURRENT HISTORIC STATUS

The La Honda Creek Redwood Cabin has not been previously evaluated for historic status, however according to the District records it was constructed in 1928, and would therefore be age-eligible to be evaluated for status as an historic resource. The preparation of an Historic Resource Evaluation (HRE) for the Redwood Cabin is outside the scope of this Basis of Design report. As the cabin was constructed greater than 50 years ago, it is considered an age eligible resource under the California Environmental Quality Act, Page & Turnbull has considered the building as an historic resource for the purposes of evaluating the proposed project alternatives. We consider it very likely that the building would be considered as California Register eligible when and if an HRE is prepared for the property.

CHARACTER-DEFINING FEATURES

Character defining features of the Redwood Cabin include the following:

Exterior:

- The siting of the cabin on the side of a steep hill in a grove of redwood trees.
- Overall rustic style and materials – barked log construction with saddle notched log corners and chinking.
- The elevation of the cabin on numerous wood columns
- The simple, rectangular massing
- The low, simple gable roof
- Skylights in the roof of the primary façade.
- Massive central stone chimney
- Exposed rafter tails on long facades
- Wide porch with log railing on three and a half sides of the cabin
- Generally symmetrical door and window placement on the primary façade
- Paired wood casement windows, with two-over-two divided light sashes.
- Wide, simple, unfenestrated, solid wood primary entrance door with decorative iron hardware.
- Absence of decorative trim around door and window penetrations.
- Two-panel redwood stile and rail wood doors at secondary entrances with undivided glazed top panel.

Interior:

- Large central stone hearth and fireplace with exposed chimney to roof
- Exposed redwood roof framing, including king post trusses spanning the full width of the building, rafters, purlins, and straight sheathing.
- Open character of the common spaces, with large central common room, and walls terminating at the base of the roof trusses.
- "H" plan organization relative to the primary (eastern) façade. Two transverse log walls run between the east and west exterior walls, and a long log wall runs perpendicularly between them behind and engaged with the chimney.
- Secondary partition walls framed and finished with milled redwood.
- Matching interior two-panel stile and rail solid redwood doors with matching rustic hardware.
- Redwood log hanging light fixtures.
- Simple redwood plank flooring running longitudinally throughout the building (covered by linoleum in the kitchen and bathroom).

PERMITTING AGENCY – AGENCY HAVING JURISDICTION

The Redwood Cabin is located in San Mateo County within a Resource Management zone Timber Production Zone/TP-Z.. The authority having jurisdiction for environmental approvals including the issuance of planning approvals and building permits is the County of San Mateo Department of Planning and Building Department. Permitted uses within the Resource Management Zone include the following:

- Agricultural uses and accessory structures, on-site sales of agricultural products.
- Nurseries and greenhouses
- Temporary trailer parks and other housing for farm laborers
- Livestock raising and grazing
- Dairies
- Kennels or Catteries
- Timber Harvesting (see zoning code for specifications)
- Quarries and waste disposal
- Single-family residences
- Public and private clubs
- Public recreation
- Commercial recreation

EXISTING CONDITIONS ASSESSMENT

On July 10th, 2019 Page & Turnbull performed a visual conditions assessment of the exterior and interior of the Redwood Log Cabin, located within a forested area of the La Honda Creek Preserve, which is operated by the Midpeninsula Regional Open Space District. Conditions were examined and documented using digital photography at ground level and from the elevated porches for the exterior, and from the floor for the building interiors. For the assessment of structural conditions, please see the report produced by ZFA.

The conditions assessment investigated the following exterior building elements:

- Wood
  - Windows
  - Access doors
  - Wood pilings
  - Roofing (Shingles)
  - Log Walls/Framing
  - Porches
  - Stairs
- Stone masonry/concrete
  - Chimneys
  - Foundation
- Metals
  - Antique stove chimney
  - Ventilation pipes and utilities connections

The interior building elements investigated were the following:

- Wood
  - Floors
  - Stud partitions
  - Interior doors
  - Roof trusses
  - Roof framing
  - Log Framing
  - Log interior walls
- Stone masonry
  - Chimney

Interiors were evaluated for the presence of protected animal species residing in the building, current conditions of the different elements, and modifications required to bring the building up to the current version of the California Building Code (CBC) and California Existing Building Code (CEBC) standards.

An analysis of specific code deficiencies for occupancy was not conducted, however general code considerations related to the four proposed project alternatives will be discussed as applicable. Prior to conducting the survey, Page & Turnbull was provided with a Preliminary Findings report by BCA Structural Engineers dated May 18, 2014.

While the scope of this report does not include the preparation of restoration documents or specific recommendations for repairs any costing of such work should consider that the work is to be performed in accordance with the Secretary of Interiors Standards for Rehabilitation which indicate the following hierarchy: protect and retention, repair, replace in-kind.

Exterior:

Windows:

The windows are generally in good condition. Locks, hinges and other metal pieces appear to be original and in working order, though rehabilitation and maintenance may be required in the future if the cabin is to be occupied. On the northern façade, the differential settlement of the cabin has caused the window frames to be out of square and out of plane with the window sash.

All windows are covered up from the exterior with metal screens to mitigate foreign intrusions, with the exception of the kitchen window facing west, which is boarded up on the outside. There are five (5) skylight windows along the eastern side of the roof, barely visible from the exterior due to the steep grade of the terrain. The skylights appear to be anodized aluminum frame replacement for original skylights based on their harmony with the roof framing. One of the skylights has been broken, likely due to a falling object, and the location has been covered from the exterior with plywood.

Doors

The primary entry door is in generally good condition. The door is solid wood approximately two-inches thick and doesn't have signs of major weathering or insect related deterioration. There is some biological growth on the exterior side of the door due to the damp, and there is some water staining and deterioration at the bottom of the door where it meets the wood sill. The door frame is in overall fair condition, however the bottoms of the jambs are in poor condition, having lost material to rot and insect activity. Dutchman repairs of the lower 12-15 inches of the door jamb may be necessary, as the deterioration appears too extensive for a successful repair with wood patching compound. The operation of the door is fair, as its in-swing collides with the floor preventing it from opening more than 60 degrees. It is not clear whether the impediment to the door operation is a result of the overall building settlement, or the heavy door shifting on its hinges over time; it is possible that multiple factors contribute to the problems with opening the door.

The secondary entry doors exhibit a variety of conditions from good to poor. The glazed French doors connecting the dining room to the eastern side of the porch are in good condition and protected at the exterior with half-inch metal wire screens. The glazed wood door from the kitchen to the west side of the cabin is in fair condition; the glazing and overall structure of the door appear sound, however the wood panel under the middle rail is largely missing and boarded from the interior with plywood, and would need to be repaired for the building to be stabilized or occupied. The exterior door to the pantry, consisting of a screen door and glazed stile and rail door (similar to the one found in the kitchen) is in good condition, stored inside the pantry with the opening boarded up with plywood. A second screen door stored in the pantry is in good condition, and likely was hung at the kitchen door prior to mothballing the building. A third door on the west side of the building (moving from south to north) is either a non-original replacement door, or a modified original door; the opening has been boarded up from the exterior. The fourth door on the west side is in fair to poor condition; the bottom rail is badly deteriorated and displaced, as are the bottoms of the stiles; those components would need to be replaced to stabilize or rehabilitate the building. The door on the north side of the building onto the porch is also in fair-to-poor condition; the wood panel below the middle rail is largely missing; the rail is damaged; the condition of the glazing is unknown since that area is boarded at both the interior and the exterior; and the frame of the door is no longer properly set into the logs surrounding it due to how the logs on the north side of the building have settled and displaced.

<u>Wood Posts</u>

The entire cabin is supported by a system of wood posts, some of which are set into or bear directly on the ground, while others are set on concrete bases. All of the posts display varying degrees of moisture and humidity saturation, as well as signs of rot and insect attacks. The posts set into the ground are in poor condition while the ones set on concrete bases are in fair condition.

Figure 1

Central chimney supported by stone masonry foundation. Wood posts on the Eastern half of the building mostly standing directly on concrete foundations while those corresponding to the western half are embedded directly into the ground.

Figure 2

Different foundation systems for the wood posts appear to contribute to differential settlement of the structure, leading to the collapse of some sections of the porch and observed displacement of various architectural elements.

There is also visual evidence of humidity saturation and rot of the beams and girders supporting this section of the building. The area shown in Figure 2 is under the collapsed section of the porch at the northwest corner of the cabin.

Figure 3

Deterioration of base of wall logs in the façades, including natural growth of moss and lichens, rot, loss of wood mass due to insect attacks (including termites). Separation from other elements such as door frames causes openings that facilitate the entry of humidity and organic attacks.

Roofing (Shingles)

The wood shingle roof is partially covered by branches, leaves and other debris rendering impossible an effective visual assessment of its current state. Nonetheless, the roof appears to be in good to fair condition. The roof appears to be generally sound, however a slight slope toward the north where the building is settling was observed, and there is slight sagging along the ridgeline of the roof between the king post trusses. The shingles, where visible, appear to be in fair condition; they exhibit weathering and biological growth toward the edges of the roof. At the eaves, the shingles are splitting, and the resulting inadequate water shedding likely contributes to the deterioration of the exposed rafter tails. No significant displacement or cupping of the shingles was observed.

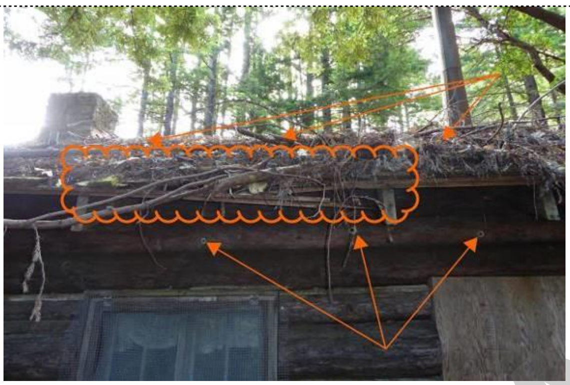


Figure 4

Ending edge of roof slope with deteriorated framing and supporting elements. Accumulated leaves, branches and debris increasing roof bearing load, and increasing water retention

Figure 5

Joining of chimney and shingling. Differential movements of the wood structure elements with the stone masonry of the chimney have displaced the original position of the joining elements, creating openings that allow water intrusion around the chimney penetration.

Log Walls/Framing

The log walls of the building are in good to fair condition overall, while the exposed ends of the logs are in fair to poor condition, with more deterioration generally observed closer to the base of the wall. The logs appear to be second or third-growth redwood due to the exceptionally wide growth rings, which makes them more susceptible to absorbing moisture and attack by insects. The ends of the logs appear to be saddle notched, however it appears that they may have been assembled with the notches facing up rather than down, allowing for water to absorb into the ends rather than shed from them. The heads of all the logs are cut in a cuneiform shape displaying the ring structure of the wood. Several logs show some discoloration from humidity and rot, as well as holes from insect activity.

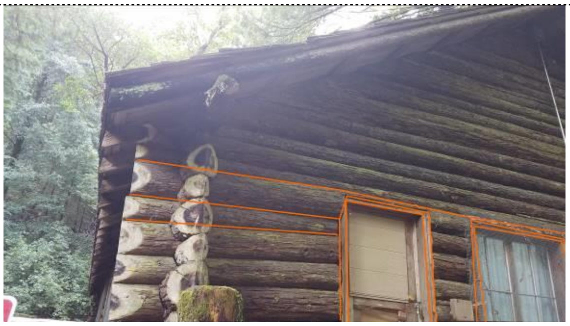


Figure 6

Effects of differential settling of supporting piles on North façade, displaying logs with loss of horizontality, and several logs displaced from the vertical plane of the wall. Evident signs of natural growth and other deterioration

Figure 7

North side and North-West corner of porch partially collapsed due to differential settlement of supports.
Several elements of the railing are missing or have collapsed

The settlement at the northwest side of the building has caused displacement of the logs forming the northern wall, particularly within the gable.

<u>Porches</u>

Where it is still standing, the deck of the porches is in fair conditions in general, however rot and unstable foundations have caused the porch to collapse in a few locations. A substantial portion of the northwest corner of the porch has collapsed, apparently due to a combination of factors including tree growth, ground movement, and deterioration of the wood members of the porch itself. An area of decking on the southern side of the porch has also collapsed, most likely due to rot.

Several sections of the perimeter railing in the Eastern section of the porch are missing or have pieces that have collapsed. Portions of the railing have also failed in the South and North section where the decking and structure have collapsed. The log posts and railings display biological growth of moss and lichens, and typically exhibit deterioration at the ends and joints. Improper use of nails that has split the railing ends, providing a path to the interior of the wood for water and insects. There's evidence of insect attacks in several places. The railings in general are in fair to poor conditions. Based on our preliminary evaluation, the railing does not comply with current CBC requirements.

Figure 8

Partial collapse of floor boards at East porch. Several elements of railing are missing or have collapsed. Top half of log façade has several logs out of the vertical plane as they don't have the half log joint at either end to provide them with necessary stability. Warping and combing of roof structure clearly visible at the edge line.

Figure 9

Deterioration of railing elements. Inefficient nailing originating cracks that facilitate termite and other insects' entry. Loss of mass of wood elements. Natural growth of moss and lichens

<u>Stairs</u>

There's a set of stairs leading down out from the North-East corner of the porch, reaching a landing after six (6) steps and then opening to the North front of the building with two more steps, and to the East front of the building with a complete set of stairs in "L" shape. The wood stair terminates at several steps carved from the natural slope of the terrain and framed at the edge with embedded, square-cut timbers. The stairs are in fair to poor condition; while currently sufficiently stable to be walked on, it is evident that the effects of humidity, biological growth, and insects will shortly render the stairs unsafe if maintenance and repairs are not undertaken.

Figure 10

Railing of access stairs severely deteriorated in some sections. Natural growth of moss and lichens, evident display of termite and other insects' attacks and loss of mass of wood elements. Flooring covered with leaves and debris retaining humidity and increasing rot, growth and insect damage possibilities

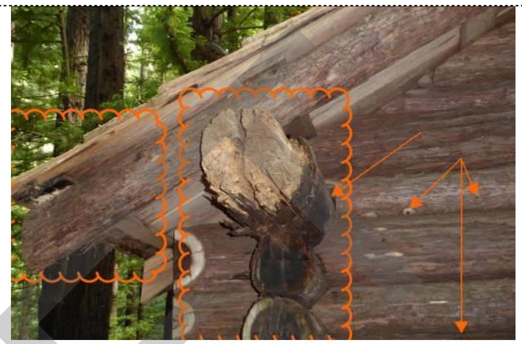


Figure 11

End of façade logs displaying evidence of mass loss, rot and high degree of humidity. Ring structure allows to consider logs from 2nd or 3rd growth woods. Higher deterioration of roof edge elements for lack of protection. Visible holes of insect attacks and damages. Opening at log joints allowing rodent entry.

<u>Chimney</u>

The massive stone chimney begins at the ground below the cabin, rises through the center of the cabin, and terminates above the roof. The stone used for the portion of the chimney below the cabin appears to be a different type than the stone used inside the cabin and above the roof. The exterior sections of the chimney appears to be in generally good condition, with some minor exfoliation of the sandstone base and some minor cracking.

Above the roof, the flashing installed between the chimney and the roofing appears to be displaced, with many open joints that may be allowing water to penetrate the roof around the chimney. The upper portion of the chimney also exhibits biological growth, particularly on the north and east sides where the moss appears to be well established. The flashing and roof around the chimney should be inspected and repaired as part of mothballing, stabilization or rehabilitation efforts.

<u>Sheet Metal Stove Chimney</u>

Due to the presence of a significant accumulation of organic debris on the roof surrounding the stove chimney, it was not possible to visually assess the condition where the chimney penetrates the roof. This penetration should be inspected and repaired as required as part of mothballing, stabilization, or rehabilitation efforts.

<u>Ventilation pipes and utilities connections</u>

Most of the utility connections are in fair to poor condition. Utility penetrations are found on the north and south walls, through the decking, or through the cabin floor next to the final service point of the line. None of the penetration appear to have waterproofing, allowing rainwater to filter through these openings into the various wood elements; as the wood surrounding the penetration deteriorates, it provides an opening for rodents and insects to enter the building. The condition of ventilation pipe penetrations through the roof could not be visually assessed due to the accumulation of organic debris on the roof.

Formal assessment of the electrical service to the Redwood Cabin was outside the scope of this survey and analysis, however some general observations were made of the existing system. Electrical outlets were observed adjacent to the floor, with conduit penetrating directly through the floor. Surface-mounted knob-and-tube electrical wiring was observed running along the top of the log walls and along the bottom cords of the trusses to provide power to hanging light fixtures. A general connection box was observed on the south façade, and appears to be disconnected from power supply, however there does appear to be power supply to the site that could likely be reconnected if the building were rehabilitated for occupation.

Interior:

<u>Floors</u>

The general floor of the interior is in good conditions, being stable and without signs of deterioration, although it has a general slight slope towards the north side of the building. The linoleum floors in the kitchen and bathroom are in poor condition and exhibit significant wear and age-related deterioration. Where the primary entrance door scrapes the floor there is an arc of superficial abrasive damage.

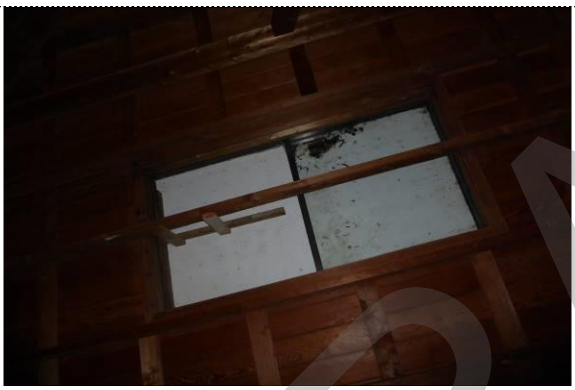


Figure 12

Skylight with broken glass possibly by fallen branch or excessive bearing load

Figure 13

Primary entrance door. Sill shows heavy wear. Door and frame show biological growth and humidity. Current maximum opening 45 degrees.

Figure 14

Kitchen area with estimated original mounted cabinets, modern oven and cooktops. Opposite is a wood fire stove with metal chimney. Some logs leave gaps and crevices due to shrinkage for humidity loss.

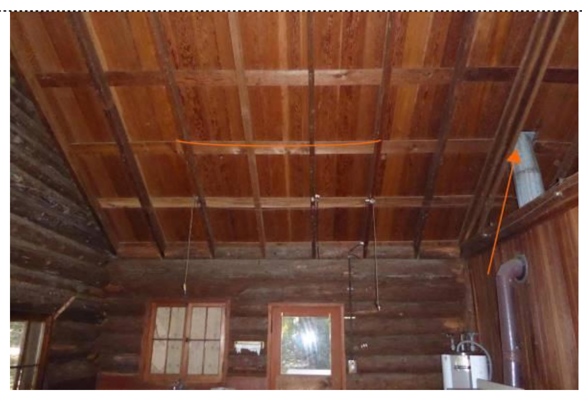


Figure 15

Roof framing appears to be in good condition. Some sagging in center sections between trusses. Exit through the roof of wood fire stove

Framed Partitions and Cabinetry

The west section of the cabin between the transverse log walls is divided by stud-framed, wood finished partition walls into a pantry, a hallway and bathroom, and a small bedroom. The northern portion of the cabin beyond the north transverse log wall is also divided into bedrooms with a similar stud-framed, wood finished partition wall with a door between them.

On either side of the frame wall separating the two northern bedrooms are middens of what are assumed to be San Francisco Dusky Footed Woodrats built around corner lavatories. A midden was also observed inside the kitchen cabinetry in the southwest corner of the cabin. The middens and their inhabitants should be relocated by experienced professionals following appropriate directions by biological monitors prior to any repairs in those particular areas.

Figure 16

Woodrat nest next to north façade

Figure 17

Woodrat nest next to north façade

Interior Doors

The interior doors are of similar construction that appears to have been designed with the cabin, and are in good condition. In some locations on the northwest side of the building, settlement has caused the door frames to rack, and they would need to be squared as part of a rehabilitation effort to allow occupancy.

Figure 18

Vertical wood plank walls system also used for hard top ceiling of bathroom. Linoleum floor in bathroom

Figure 19

Wood peg joint system used to create the central join of truss elements

Roof trusses

The roof-supporting king post wood trusses and the roof framing appear to be in good condition, free from signs of rot, insect attack, or displacement. There are four (4) roof trusses inside the gable ends of the building, dividing the roof into five (5) sections. The tie beams of the two (2) inner trusses span the large common room on either side of the central hearth and chimney. The tie beams of the two (2) outer trusses run along the tops of the two transverse log walls. The timbers of the king post trusses still bear the pencil marks of the carpenters who constructed them.

Figure 20

Separation between chimney and roof framing due to differential settling

Figure 21

Crack along the center of the chimney originated by tensional differences from structure movements.

Figure 22

Water pipe ventilation exits through hole in the roof

Figure 23

Decrease of log volume due to natural drying originates crevices and descent of total height of walls.

Roof framing

The roof framing between the trusses appears to be in good condition as viewed from the underside, displaying no signs of weathering or deterioration except for some signs of moisture in areas around roof penetrations like pipes and chimneys. There is a slight sag in the ridge board between the trusses; the structural analysis will address whether the sag is cause for structural concern.

Log Framing

The perimeter walls of the cabin are exposed log framing. The interior of the cabin is divided into four primary sections through the intersection of three log walls: a north and a south transverse wall, and a longitudinal wall running between them behind the chimney on the western side of the cabin. The longitudinal wall behind the chimney shows signs of settlement where the mortar between the logs and the stone has gaps of up to one inch. Based on the way the mortar has broken and displaced, it appears that the logs are what have settled, rather than the chimney; this could be due to the logs shrinking as they dried out, or there may be softening of the logs over time that has compressed them under their own weight.

The interior face of the perimeter log wall shows signs of insect infestation activity, particularly along the south wall in the area of the dining room and kitchen, and the gable logs have displaced, similarly to the north side.

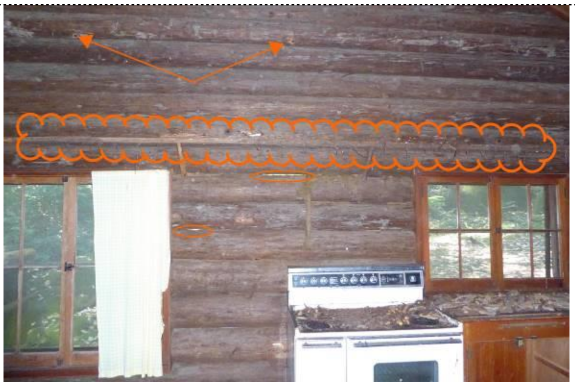


Figure 24

Kitchen area with estimated original mounted cabinets, modern oven and cooktops. Some logs leave gaps and crevices due to shrinkage for humidity loss. Logs out of plane for insufficient joining. Damages from termites and insect attacks

Figure 25

Shrinkage of wood originates differential movement from the chimney and trusses, creating separations and crevices between these elements. Electric wiring over top of log wall and side of truss beam.

Hearth, Fireplace, and Chimney

The chimney is formed by coarse, rounded stones set with mortar. The chimney is in generally fair condition, however several significant cracks were observed, especially one that runs vertically up the center of the chimney through several stones. There's a metal lintel of the firebox which aids in transmitting the loads to the sides of the opening, and which is also presumably responsible for the crack not widening further. Water staining at the back of the firebox was observed below the flue, indicating insufficient protection from moisture at the top of the chimney. Several bricks at the back of the firebox were also cracked and spalled, which could be due to a combination of compression, moisture, and heat. The hearth is formed of cast-in-place concrete that is flush with the adjacent floor.

PROPOSED PROJECT ALTERNATIVES EVALUATION

The following evaluation concerns the work required to address architectural deterioration and deficiencies, and plan for the necessary building maintenance associated with the proposed project alternatives. For recommended structural stabilization and rehabilitation work, please see the report produced by ZFA.

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

   This option proposes to install a fence around the perimeter of the property to restrict access to the home in order to mitigate potential public safety concerns associated with unauthorized access to the building. Portions of the deck surrounding the cabin are in a state of active collapse, and should be removed or stabilized to protect District staff needing to access the site for inspection or maintenance. Since this option does not seek to stabilize the resource for any future use or prevent further deterioration, it would not be consistent with the Secretary of the Interior's Standards. While it is difficult to estimate how long the building could deteriorate before it has deteriorated beyond repair, the substantial settlement of the northwest corner of the cabin and the associated displacement of log walls, doors, windows, floors, and roof framing are cause for concern.

2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

   Of the treatments defined by the *Secretary of the Interior's Standards,* the standards for Preservation are most appropriate to this proposed project alternative. Mothballing efforts should comply with the National Park Service's Preservation Brief #31, *Mothballing Historic Buildings.* The purpose of mothballing as defined in the Brief is to control the long-term deterioration of the building while it is unoccupied and to find methods to protect it from sudden loss by fire or vandalism. The specific mothballing program should be developed by a team including a preservation architect, an architectural historian, a structural engineer, and a qualified contractor. General recommendations for this approach are described below.

Immediate fall-hazards from the collapsing porch should be removed, and the existing barricades and signage preventing access to the porch should be maintained with at least semi-annual inspections. The area of structural posts underneath the cabin should be fenced off to prevent unauthorized access and mitigate the associated risk of fire from unauthorized shelter underneath the cabin. The windows, doors, and skylights should be securely covered with plywood to prevent further damage to glazing. Adequate ventilation shall be installed that is sufficiently protected from the intrusion of additional insects and wildlife. The settlement of the building at the northwest corner should be addressed and stabilized. Plumbing and electrical service to the house should be properly disconnected. The wildlife currently resident in the building should be relocated according to District standards.

The roof should be inspected at least semi-annually before and after the rainy season and cleared of debris to allow for proper drainage. The interior of the cabin should be inspected at least three times annually, coinciding with before, during, and after the rainy season to check for leaks; localized repairs may be undertaken if appropriate, but the roof should be replaced as required at the end of its designed service life. It was not possible to determine during the conditions assessment whether the roof was composed of wood shingles or wood shakes, but the life expectancy may be between 20 and 40 years if properly installed and maintained. The District should determine when the roof was last replaced and replace it in-kind if it has not been replaced in the last 30 years.

Trees around the cabin should be maintained and trimmed as necessary for their health and stability to reduce the risks to the cabin of falling limbs or trees. Security measures should be undertaken and installed at potential points of access in order to protect the building and the public.

3. **Repair and rehabilitate the structure for reuse** as a retreat space, meeting space, or hikers hut.

While the Redwood Cabin is currently unoccupied, for the purposes of this Basis of Design analysis we have assumed that the current occupancy is classified as Residential based on its architecture, fixtures, and reported past uses. With a gross building area of approximately 1,800 sf and an occupant load factor of 200, the maximum occupancy of the Redwood Cabin under the current occupancy classification is nine (9) people. In considering use of the building as a meeting space, the large common room at approximately 595 square feet is the most likely room to be utilized in that capacity. Per the 2016 CBC, Section 303.1.2, a room or space used for assembly purposes that is less than 750 square feet in area and accessory to another occupancy shall be classified as Group B occupancy or part of that occupancy, therefore use of the common room as a meeting space would likely not require a change of use from the existing Residential Occupancy.

Of the treatments defined by the *Secretary of the Interior's Standards*, the standards for Rehabilitation are most appropriate to this proposed project alternative. Rehabilitating the structure to allow for the uses being considered would likely require upgrades and alterations of several site and building elements.

For the purposes of this Basis of Design analysis, it is assumed that the building would be made accessible for the uses being considered, though further code analysis may determine that without a change of occupancy, accessibility upgrades may not be required. A formal accessibility review was not part of the scope of this investigation, however based on observations of the site there does not currently appear to be an accessible path to the cabin. Possible solutions could include providing vehicular access to the top of the hill around the south end of the cabin, or developing a switch-backed ramp in the landscape on the southeastern side of the building to visually balance the stair access on the northeastern side. If site access were provided to the southwest corner of the porch, accessible access to the building interior could be provided by modifying the door at the southwest corner of the building to provide the necessary width and door hardware.

General repairs would be required to address the deterioration of various building components noted in the Conditions Assessment. In addition to the work described in the second proposed project alternative (stabilization) the following work should be anticipated. All doors, windows, and skylights should be rehabilitated; if a feature is deteriorated beyond repair, it should be replaced in-kind, including construction techniques. The logs that form the walls should be treated for insect infestations and repaired where portions have deteriorated as a result of rot and insect attacks. Cracks in the masonry chimney and hearth should be repaired with appropriate materials. The chinking of the logs should be tested to determine the existing composition, and the chinking should be repaired to create a weather-tight enclosure. Plumbing and electrical service would need to be upgraded and reconnected. In the bathroom, new flooring and toilet, lavatory, and shower/bath would be installed. If a functional kitchen is desired for the new uses, new cabinetry, a new sink and fixtures, and a new oven and stove would be required. The existing antique stove may be original to the cabin and may be able to be salvaged and restored if desired. The floors may require repair in certain areas where there has been rodent habitation or water intrusion, and gentle refinishing may be undertaken. A finish study should be conducted to determine what the original finish is on the floor, and compatible finishes should be chosen.

Ongoing maintenance considerations include annual inspection of the chinking between the logs and localized repairs as required; semi-annual inspection of the roof before and after the rainy season to clear debris and maintain drainage; and replacement of the wood-shingle roof every 20-40 years.

4. **Remove the structure** and restore the underlying natural resource values.

   Since the Redwood Cabin is over 50 years old, an Historic Resource Evaluation would need to be prepared to officially determine whether the structure is an historic resource. If the Redwood Cabin is determined *not* to be an historic resource, demolition would likely follow a typical process for permitting and contracting the demolition work through San Mateo County. If the Redwood Cabin is determined to be an historic resource, additional processes may be required to obtain demolition permits. Debris from the demolished building, including all hazardous materials, would need to be disposed of in accordance with Local, State, and Federal Regulations, and the site would need to be cleaned up and remediated to allow for public access.

EXHIBIT B

Structural Condition Assessment and Basis of Design

by ZFA Structural Engineers

Attachment 1

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

REDWOOD CABIN
STRUCTURAL CONDITION ASSESSMENT REPORT AND BASIS OF DESIGN (BOD)

Midpeninsula Regional Open Space District

La Honda Creek Open Space Preserve, San Mateo County, California

District Project Number: MAA05-009

March 2020

Prepared For

Midpeninsula Regional Open Space District

330 Distel Circle

Los Altos, CA 94022

Prepared By

Steven Patton, SE, Senior Associate

Mark Moore, SE, Principal-in-Charge

San Carlos, California

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

The following structural Basis of Design report provides an evaluation of the condition and anticipated performance of the existing Redwood Cabin structure to support seismic and gravity loading as well as a conceptual design of the structural scope required to achieve four proposed project options. The findings and recommendations contained herein, in conjunction with those from the other team members, are intended to assist the District with cost evaluations and decision-making. The four options being considered are:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a retreat space, meeting space, or hikers hut.
4. **Remove the structure** and restore the underlying natural resource values.

Structural Condition Assessment

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. During one site visit with the hazardous material specialist, the District staff were on site to provide access to interior portions of the building. The interior review included a walkthrough of the ground floor and crawl space areas. No access was provided to the building's roof. The structure appeared to be in generally poor to fair structural condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review. As-built drawings contained herein were created by ZFA based on visual observations and measurements made during site visits.

The following structural deficiencies were also observed in the existing building; all photos referenced can be found in the *Structural Systems and Condition Assessment* section.

- Significant settlement of the framing was observed at the northwest corner of the building resulting in instability of the north gable end wall (see Photos 2 and 9).
- There are (3) widely spaced isolated piers along Line 1 which show evidence of settlement and rotation indicating they are founded on inadequate bearing material or undersized footings. This may be contributing to the instability of the north gable end wall above (see Photo 9).
- It appears the building was originally founded on 12" to 18" diameter log poles placed directly into the native soil. As discussed in the geotechnical report, the embedment depth of the log poles into the soil is uncertain and all show indication of rot or decay in the lower 12" of the poles (see Photo 5).
- The log poles at the building's interior, which have remained relatively dry are still mostly intact, though at all locations at the building's perimeter, rot and decay is observable in the post bases that are set directly on grade. The above-grade portions of the poles were typically found to be in a reasonably good condition (see Photo 10).
- Portions of the existing deck on the north, west and southern edges have fully or partially collapsed. The eastern portion of the deck is framed with modern, pressure-treated sawn lumber materials indicating it is of more recent construction and appears to be in fair condition (see Photos 2 through 5).
- Large portions of the deck railings have failed or are missing, and all are non-compliant with code regulations (see Photos 1 through 4).

- Locations where the log walls penetrate through the floors, gaps appear to have opened, allowing rodents to enter the building. These gaps should be filled.
- Positive connection of the floor framing to the log walls and vertical pole substructure is generally lacking (see Photos 5, 9 and 10).
- In general, the log walls appear to be in good condition. However localized insect damage was observed primarily at the base of the log walls in the lower 3 courses (see Photo 6 and 7). An extensive inspection and treatment plan should be completed by a licensed pest control specialist.
- Gaps have developed between logs due to settlement, shrinkage and loss of the chinking and fill material. These gaps should be refilled as part of wildlife exclusion measures. See Photos 11, 14 and 15 for representative examples.
- At the corners of the building, the interlocking horizontal logs extend beyond the face of wall. The ends of these logs have less protection from the roof overhangs, and many of the lower logs have experienced significant damage and deterioration (see Photo 6). The short pieces of shaped logs at the ends of the sawn beams have in some cases experienced significant deterioration and have become detached.
- The horizontal logs at the gable end walls are only attached to the roof above the eave elevation. Due to lack of positive connection, these logs may become unstable if continued settlement occurs or during an earthquake event and could be a significant falling hazard (see Photos 2 and 4).

Seismic Assessment

The Redwood Cabin has been reviewed for the Collapse Prevention performance level using the ASCE 41-17 Standard for Seismic Evaluation and Retrofit of Existing Buildings, Tier 1 Evaluation. The building was reviewed based on the visual assessments performed by ZFA staff, geological investigation performed by Romig Engineers and ASCE 41-17 structural Tier 1 checklists. Nonstructural elements were not included in the scope of the Tier 1 analysis.

The building is framed using heavy timber logs stacked horizontally to form walls. The crawl space of the structure below the ground floor level is laterally supported by irregularly spaced and inadequate wood braced frames in both plan directions. The structure lacks a complete load path and is expected to perform poorly during a significant earthquake. Sixteen (16) Tier 1 deficiencies were identified as noncompliant, see Findings and Recommendations section of report for additional information on the items noted below:

- LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
    - Inadequate number of bays of braced frames are provided. Due to lack of redundancy, additional new braced bays and strengthening of existing braced bays in the crawl space are required to provide structural stability.
    - The existing brace connections are inadequate to develop the buckling/yield capacity of the braces. Of concern is the lack of anchorage at the brace to foundation connection which is necessary to resist the vertical reaction from the brace. Complete replacement of the braces and their connections is recommended and may be required if any of the planned renovations trigger mandatory retrofits.
    - The existing log frame columns and anchorage are inadequate to resist axial forces due to frame overturning.
- WEAK STORY, SOFT STORY, VERTICAL, GEOMETRY and TORSION IRREGULARITIES conditions exist primarily due to inadequacies of the crawl space framing.
- REDUNDANCY: There is a complete lack of any of lines of shear walls in each principal direction at the crawl space. The existing 2x bracing is inadequately sized and connected.
- SHEAR STRESS CHECK: No shear walls are present in the crawl space.
- WALLS are not positively CONNECTED THROUGH FLOORS: Shear walls do not have an interconnection between stories to transfer overturning and shear forces through the floor.

- HILLSIDE SITE:
    - Portions of the foundation along parts of the southwest ends of grid lines 1 & A are very short where the crawl space is less than 2 feet tall. These elements are likely contributing substantially to the building's seismic capacity. This hillside condition results in the presence of stiffer elements at the uphill corner of the building and results in a potentially damaging torsional response when subject to strong shaking.
- CRIPPLE WALLS, WOOD SILLS and WOOD SILL BOLTS are not present in the crawl space level below first-floor-level shear (log) walls.
- WOOD POSTS: There is no positive connection of wood posts to the foundation.
- GIRDER/COLUMN CONNECTION: There is no positive connection using plates, connection hardware, or straps between the girders and the column supports.
- SPANS: All wood roof diaphragms with spans greater than 24 ft consist of wood horizontal lumber planks instead of structural sheathing or diagonal lumber.

Geotechnical Investigation

A geotechnical investigation report has been provided by Romig Engineers. Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- Varying depth to competent bearing material ranging from 2 feet to 4 feet is anticipated across the structure (page 3).
- The unknown depth of embedment and construction materials used to embed the redwood posts/foundations (page 8).
- The remote location and limited access within the crawlspace for construction of uplift resisting elements (page 8).
- The history of land sliding observed and mapped upslope of the site. However, the immediate slopes and building area of the cabin appear to be relatively stable (page 8).
- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 6).

The following evaluation report details our structural findings and recommendations.

INTRODUCTION

The purpose of this evaluation is to review and evaluate the structure of the subject building using visual observations, engineering judgment and criteria provided by ASCE 41-17. The evaluation is focused on identifying deficiencies that are present in the structural system that may affect the performance of the building under gravity or seismic loads to identify structural scope that is required to stabilize the building for mothballing or rehabilitate it as an occupied structure.

The seismic evaluation is based on criteria that has been tailored for specific building types and desired levels of building performance based on observation of structural and nonstructural damage occurring in previous earthquakes and provides a means to identify general deficiencies based on anticipated behavior of specific building types. The Tier 1 evaluation procedure of ASCE 41-17 was used to assess primary components and connections in the seismic force-resisting system using standard checklists and simplified structural calculations. Checklist items are general in nature and are intended to highlight building components that do not exceed conservative construction guidelines. If the element is compliant, it is anticipated to perform adequately under seismic loading without additional review or strengthening. Items indicated as non-compliant in a Tier 1 checklist are considered potential deficiencies that require further analysis. The results of the Tier 1 evaluation provide a general understanding of the anticipated performance of the structure in its current state and inform the structural scope required to provide overall stability if the building is to be mothballed with no public access to the interior. If the building is to be rehabilitated for an occupied use, the Tier 1 results indicate that retrofit of the structure is required. The retrofit is designed to the governing building code, which is the 2016 or 2019 California Historical Building Code. The structural scope for these options, as well as restricted access and demolition options, are summarized in this report.

EVALUATION OVERVIEW

This structural evaluation report for the existing Redwood Log Cabin is based on the following:

- The American Society of Civil Engineers/ Structural Engineering Institute (ASCE/SEI 41-17) Standard for Seismic Evaluation and Retrofit of Existing Buildings - Tier 1, Collapse Prevention level structural evaluation criteria.
- Multiple site visits for general review of the structure were performed by Steven Patton of ZFA. No destructive testing or removal of finishes was performed or included in the scope.
- Review of the following drawings:
    - Record structural drawings sheets S1 through S6 by BCA Structural Engineers, dated 4/29/2015.
- Existing material properties as indicated in Appendix C.
- Review of the following geotechnical report and hazard maps:
    - Geotechnical Report prepared by Romig Engineers dated 10/2/2019

STRUCTURE OVERVIEW

<u>General Site Description</u>

The building is located on a sloping site located in the Midpeninsula Regional Open Space District (District) La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The building site is in a remote and forested area approximately 1/4 mile from Skyline Boulevard. Access to the site requires a District permit, travel through two locked gates and over two bridges (see Photos 17 & 18) with unknown load carrying capacity. The final 400 yards of the site access road is rough and unpaved, requiring a 4-wheel drive vehicle or access by foot. The site and one-story Redwood log framed building are currently unoccupied.

Structural Performance Objective

Per ASCE 41-17, a structural performance objective consists of a target performance level for structural elements in combination with a specific seismic hazard level. For seismic assessment of the subject building, the Basic Performance Objective for Existing Buildings (BPOE) was selected. While the BPOE seeks safety for occupants with reasonable confidence, it allows existing structures to be assessed for seismic forces that are less than those required for the design of new structures under the current building code (2016 or 2019 California Building Code). Buildings meeting the BPOE are expected to experience nominal damage from relatively frequent, moderate earthquakes, but have the potential for significant damage and economic loss from the most severe, though less frequent, seismic events. It should be noted that the cost savings from not retrofitting the subject building up to current code standards may result in greater repair costs in the event of an earthquake.

For the purposes of this Tier 1 review to the BPOE, the specified level of performance is **Collapse Prevention (S-5)** for this equivalent residential use building (Risk Category II as defined by ASCE 7). The Collapse Prevention Structural Performance Level as described by ASCE/SEI 41-17 is defined as: "…the post-earthquake damage state in which a structure has damaged components and continues to support gravity loads but retains no margin against collapse. A structure in compliance with the acceptance criteria specified in this standard for this Structural Performance Level is expected to achieve this state." Retrofit of the building to satisfy this performance objective would only be mandatory for *Option 3* which would allow for re-occupancy of the unpermitted building.

In other words, the S-5 Structural Performance Level can be defined as less than the S-3, Life Safety. For further context, the Life Safety Structural Performance Level (S-3), is described as: *'… the post-earthquake damage state in which significant damage to the structure has occurred but some margin against either partial or total structural collapse remains.'*

The letter designation in the BPOE indicates the nonstructural performance level, in this case, N-D. The Nonstructural Performance Level N-D, Hazards Reduced is defined as the post-earthquake damage state in which nonstructural components are damaged and could potentially create falling hazards but high-hazard nonstructural components are secured to prevent falling into areas of public assembly or those falling hazards from those components could pose a risk to life safety for many people. Preservation of egress, protection of fire suppression systems, and similar life-safety issues are not addressed in this Nonstructural Performance Level. A Tier 1 evaluation of nonstructural elements was not included within the scope of this review.

Site Seismicity (Earthquake Activity)

Per ASCE 41-17, 'seismicity', or the potential for ground motion, is classified into regions defined as Low, Moderate, or High. These regions are based upon mapped site accelerations S_s and S_1 which are then modified by site coefficients F_a and F_v to produce the Design Spectral Accelerations, S_{DS} (short period) and S_{D1} (1-second period). The successful performance of buildings in areas of high seismicity depends on a combination of strength, ductility of structural components, and the presence of a fully interconnected, balanced, and complete seismic force-resisting system. Where buildings occur in lower levels of seismicity, the strength and ductility required for better performance is significantly reduced and building components or connections with additional strength capacity can in some cases be adequate despite lacking ductility.

Based on the geotechnical investigation and report prepared for the subject site, the soil profile of this building has been determined by the geotechnical engineer to be classified as **Site Class C** as defined per ASCE 41-17 and is used in determination of site coefficients F_a and F_v.

Per the site values indicated by the geotechnical report, USGS data and evaluated using seismic acceleration equations and tables of ASCE 41-17, the site is located in a region of **High Seismicity** with a design short-period spectral response acceleration parameter (S_{DS}) of 1.499g and a design spectral response acceleration parameter at a one second period (S_{D1}) of 0.894g. Per the table shown below, both of these parameters exceed the lower boundaries for high seismicity classification, 0.5g for S_{DS} and 0.2g for S_{D1}.

*Level of Seismicity**	S_{DS}	S_{D1}
Low	< 0.167g	< 0.067g
Moderate	≥ 0.167g < 0.500g	≥ 0.067g < 0.200g
High	≥ 0.500g	≥ 0.200g

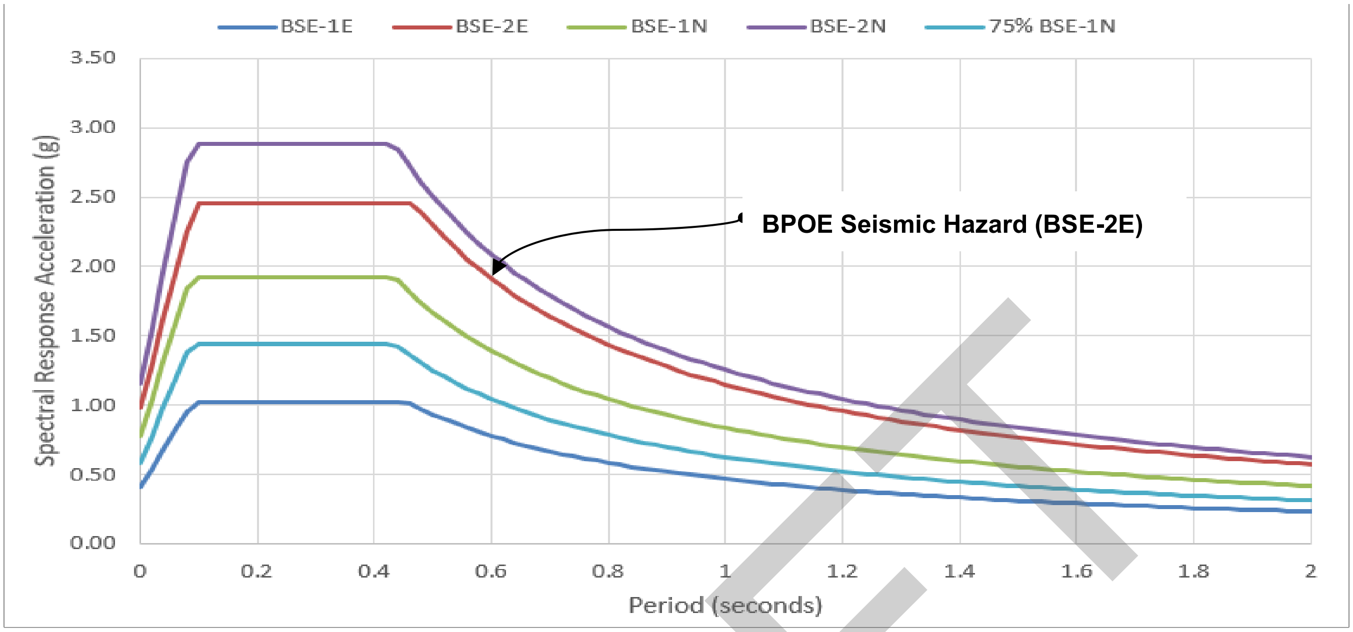
*Where S_{XS} and S_{X1} values fall in different levels of seismicity, the higher level shall be used.

The spectral response parameters S_S and S_1 were obtained for the BSE-1E seismic hazard level for existing structures (BPOE). The acceleration values were adjusted for the maximum direction and site class in accordance with ASCE 41-17 Section 2.4.1, and compared to BSE-1N (used by current building code for design of new buildings) to determine the design values for the Tier 1 analysis, since values obtained for the BSE-1E hazard level need not exceed the hazard levels for new construction.

The following charts depict the response spectra for the multiple seismic hazard levels defined by ASCE 41-17: two existing hazard levels and two hazard levels corresponding to code design of new structures (ASCE 7). Note that the seismic hazard level for design of existing structures is lower than that for new construction for this structure (period <1.0).

Seismic Hazard Level*	**Building Code Reference**	**Design Spectral Acceleration $S_{a(XS)}$(T)**
BSE-1E	ASCE 41-17 (20%/50yr)	1.026g
BSE-1N	ASCE 7-10 Design Basis Earthquake (DBE)	1.931g
BSE-2E	ASCE 41-17 (5%/50yr)	2.464g
BSE-2N	ASCE 7-10 Maximum Considered Earthquake (MCE)	2.896g

* Seismic hazard levels denoted with 'E' for existing buildings or 'N' for new building equivalency.



Structural Systems and Condition Assessment

General

Original 1920's Construction: The original building is a one-story Redwood log-framed structure. The building footprint is approximately 66 feet by 30 feet, with a floor area of approximately 1,980 square feet. Plans, sections and elevations are shown for reference in Figures 1 through 4. Refer to Appendix B for a complete set of annotated structural drawings. The building is rectangular in plan, with the long leg (longitudinal direction) oriented in the North-South direction. Multiple phases of strengthening or repair renovations to the building appear to have occurred since the time of original construction.

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. During one site visit with the hazardous material specialist, the District staff were on site to provide access to interior portions of the building. The interior review included a walkthrough of the ground floor and crawl space areas. No access was provided to the building's roof. The structure appeared to be in generally poor to fair structural condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review.

Roof Framing

The roof is composed of shake shingles supported directly on 1x horizontal lumber decking oriented up-down slope that forms the roof diaphragm. The 1x decking is supported by 1x framing at approximately 24" on center which spans between the roof rafters. The roof rafters are 3x6 nominal spaced approximately 30" on center and clear span from the ridge to the exterior walls (see Photo 12). There are 4 timber trusses spaced between 12 to 14 feet on center on the interior of the building. The end gable walls are bearing walls supporting only small tributary area from the overhang and between the nearest adjacent rafter. The ridge is framed with only a 1x member on edge and is unlikely to be resisting any loads by spanning as a beam between the trusses or end gable walls. It is assumed the ridge is serving as a connecting element between rafters on each side of the ridge to transmit thrust (axial) loads allowing the typical 3x rafters to span from ridge to supporting end walls through a combination of axial and bending loads. This load path exerts lateral loads in the out-of-plane direction on the top of the exterior longitudinal walls (along lines 1 & 3) that are likely resisted by a combination of the building's cross walls and the continuity of the 4 bottom truss chords. The building's exterior log-framed walls are serving as bearing walls directly supporting the truss and roof rafters which are notched to bear directly on the walls. The interior log walls do not extend to the underside of the roof and do not appear to have been intended as bearing walls in their original state.

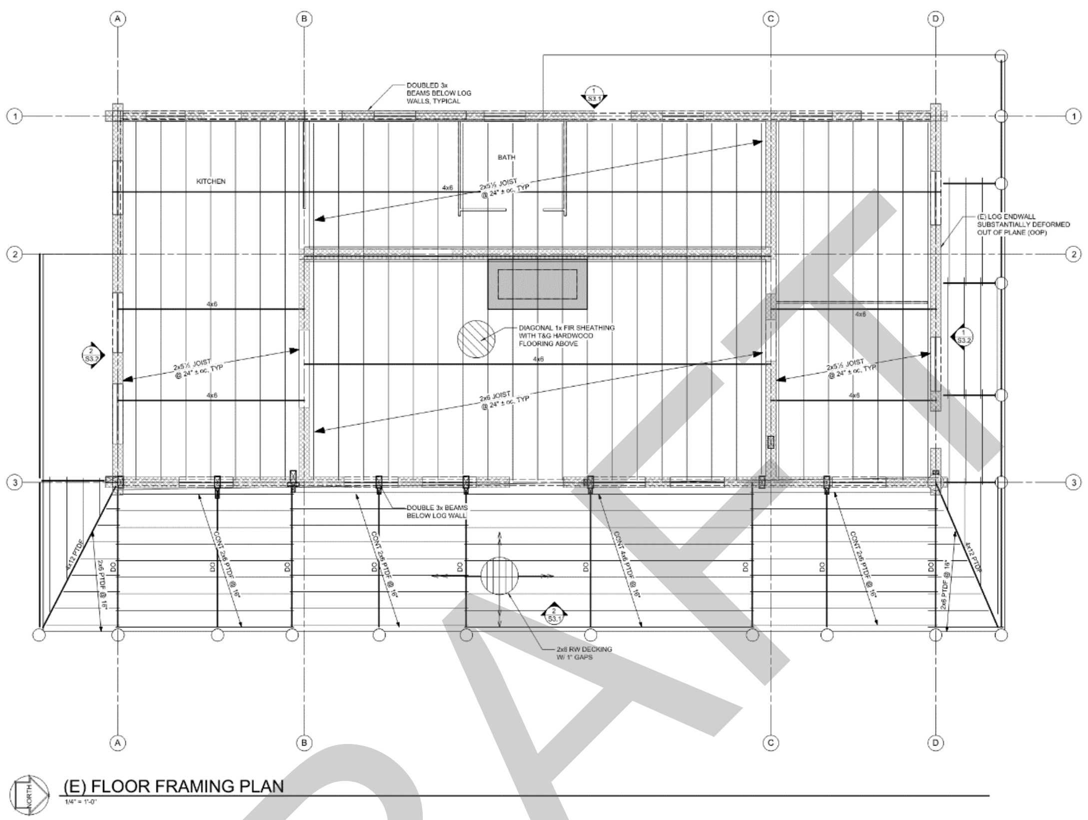


Figure 1: Ground Floor Framing Plan from ZFA-prepared Existing Condition Drawings

A full building elevation is shown in Figure 2 below of the building's front elevation. A transverse section through the building is shown in Figure 3.

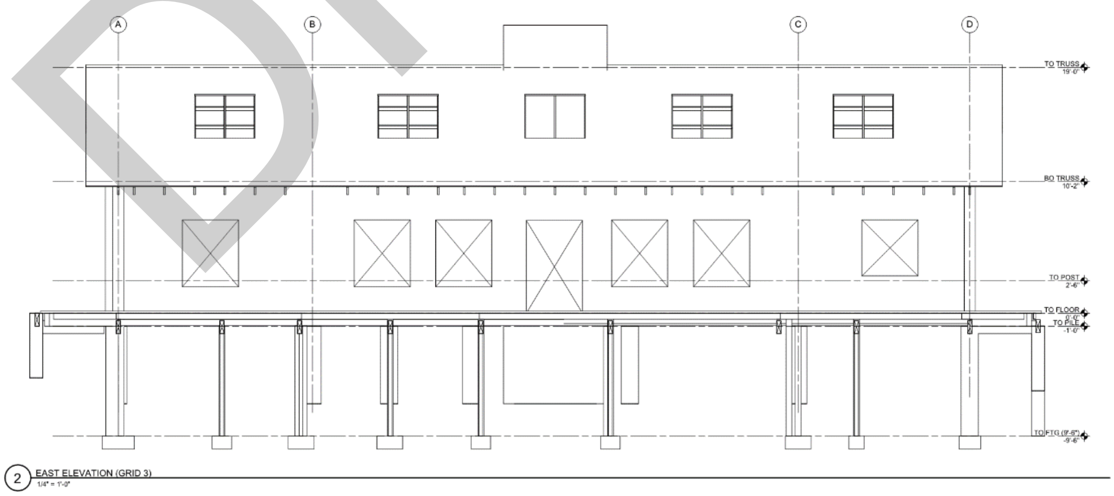


Figure 2: Full Building Longitudinal Section from ZFA-prepared Existing Condition Drawings

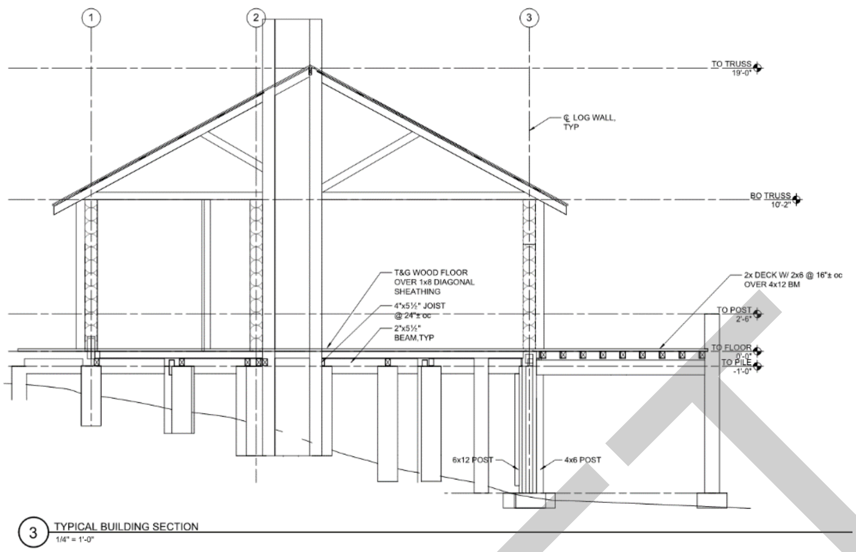


Figure 3: Full Building Transverse Section at fireplace from ZFA-prepared Existing Condition Drawings

Walls

Walls above the ground floor are typically framed with horizontally stacked redwood logs varying in diameter from 6"-12". A wood dowel was observed in one location interconnecting the stacked logs, it is assumed these dowels occur at each end of any individual log, though the spacing and quantity of dowels used could not be determined without localized destructive testing. There are interior non-bearing partition walls at multiple locations which are typically framed with 1x lumber planks spanning vertically from floor to top of wall. The interior of the log walls appeared to be in good condition except for evidence of settlement and shrinkage (see Photo 12). The exterior walls appear to have significant amounts of rot and decay, particularly at the building's corners as detailed in the Architectural Condition Assessment, see Appendix E.

Floor Framing

At the ground floor level, the flooring is composed of horizontal wood flooring directly over 1x8 diagonal lumber sheathing which serves as the buildings floor diaphragm. The sheathing is supported by 4x6 (nominal) floor joists spaced at 24" on center (see Photo 10). The floor joists span between girder lines below the building's exterior walls as well as interior girder lines, resulting in maximum joist spans between 7'-0" to 9'-6" on center. No blocking or hardware was observed between the joists and girders. The girders are typically 4" to 6" wide and were notched in many locations at the ends to bear directly on the log poles below. The floor framing was observed to be in fair condition throughout. The log walls bear directly on top of the supporting vertical log poles below, with additional sawn lumber girders set adjacent to them for support of the floor framing. No positive connections were observed between the floor framing and the log wall elements. The log poles are typically spaced closer together and generally align below the bearing log wall lines above.

Porch Framing

A wrap-around porch exists around the full perimeter of the building. Portions of the north, west and south edges of the existing deck have fully or partially collapsed areas (see Photos 2 through 5). The Eastern portion of the deck is framed with modern pressure treated sawn lumber materials indicating it is of more recent construction and appears to be in near serviceable condition. Many of the deck's railings have failed, are rotted or are missing (see Photo 1 & 2), and all are non-compliant with code regulations.

Seismic Force-Resisting System

The lateral system of the building is not a "codified" system identified under the current building code (2016 or 2019 California Building Code) but has been defined as light-framed (wood) walls rated for shear resistance for this assessment. The horizontal lumber roof diaphragm transmits roof horizontal loads to the log walls below.

Perimeter walls and two interior transverse walls are present as lateral force-resisting elements, as shown in Figure 1. The diagonal lumber floor diaphragm transmits loads to the diagonal bracing at the cripple wall level below. The lateral framing below the ground floor (crawl space) is composed of irregularly spaced 2x wood bracing that does not appear to be of original construction, that are connected to wood poles (see Photo 16).

Foundations

Foundations are generally vertical log poles embedded an unknown distance into existing grade. At select locations at the building's perimeter, shallow concrete spread footings can be observed and are likely a result of previous repairs made to the building. Reinforcing in existing concrete footings is unknown though no large cracks or substantial settlement was observed indicating they are likely in serviceable condition. Ground was observed to be in contact with approximately 40 existing log pole elements, which has caused deterioration in the lower 12" of the logs. The most severe rot was observed in the perimeter poles that were not modified to have a concrete footing (see Photo 5).

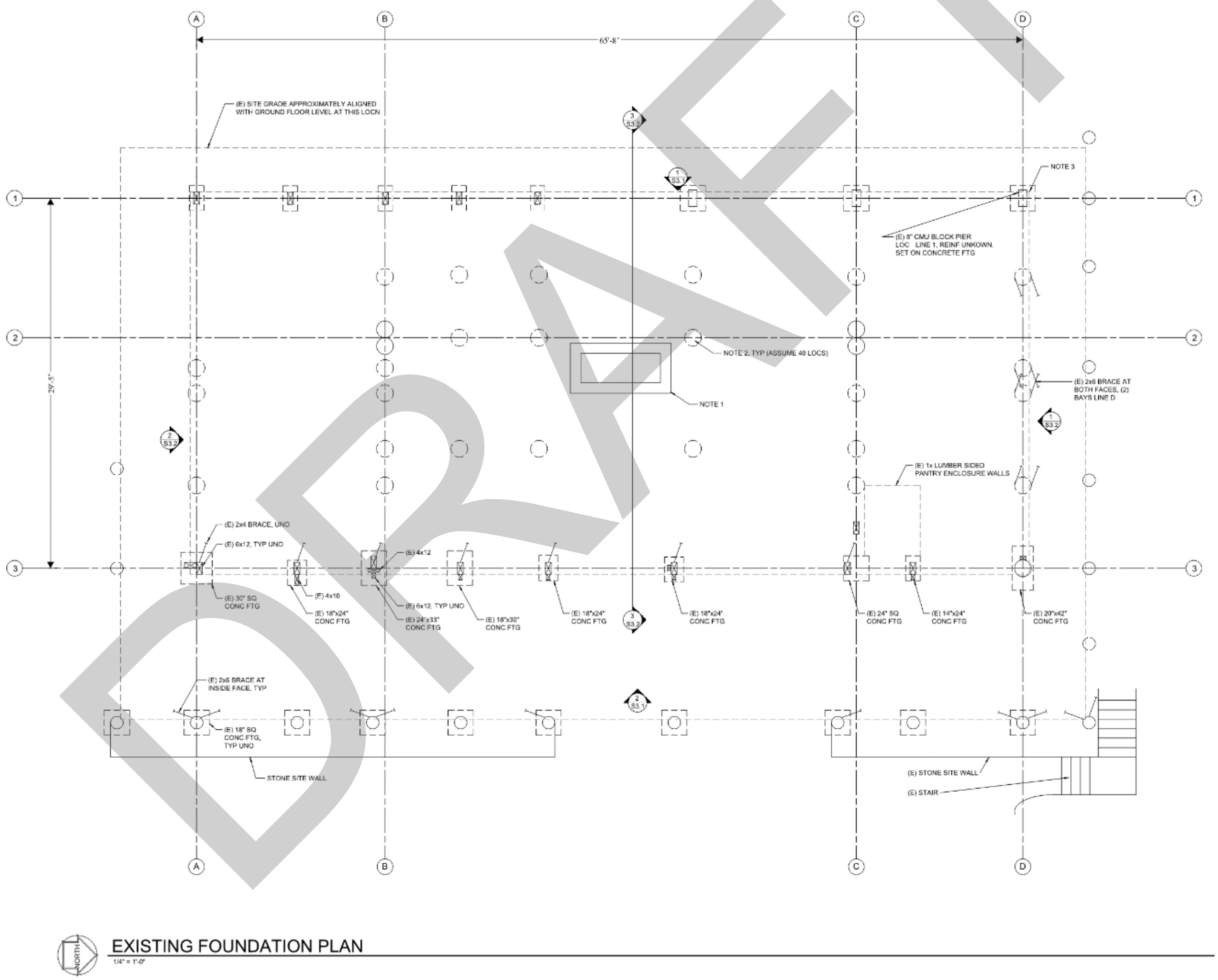


Figure 4: Foundation Plan

Material Properties

Basic properties for existing structural materials found on existing building documentation or in accordance with ASCE 41 code prescribed minimum structural values utilized in the analysis calculations can be found in Appendix C.

Photo 1.Front (east elevation) of structure, facing west (note missing guardrails)

Photo 2.North elevation of structure, facing southeast (note collapsed deck area, failed railings and log wall displaced out of plane, observable by bend in conduit)

Photo 3. Partial rear (west) elevation of Structure, facing east (note collapsed deck framing)

Photo 4.South wall elevation (note collapsed deck framing)

Photo 5. Log pole at south elevation (note severe rot and soil in contact)

Photo 6.Close up of one of the areas of log wall corners showing signs of significant rot/decay

Photo 7.Area of base of log wall showing rot/decay (note buildup of debris on porch)

Photo 8. Location where significant buildup of leaves and debris have accumulated on the roof

Photo 9. Area where dry rot/deterioration of base of log wall at corner of grid line D-1 was observed. This is likely a substantial contributor to the settlement observed in this area of the building.

Photo 10. Ground floor framing and Interior log poles set directly into grade. Interior conditions are in fair condition.

Photo 11. Interior view of main living room (note truss chords bearing on interiorlog walls and gaps evident between horizontal logs).

Photo 12. Interior view of roof framing, note gap at top chord showingevidence of load redistribution due to settlement of substructure.

Photo 13. Woodrat middens in fireplace and bedroom beyond.

Photo 14. Gap observable between chimney and fireplace.

Photo 15. Settlement evident at displaced gaps between log wall and chimney.

Photo 16. View of underside of deck and crawl space framing at east side of building(note concrete footings, fasteners and modern preservative treated lumber which shows that framing is not original).

Photo 17. Earthen bridge, first bridge to cross after 1st gate, note portions of foundation appear to be undermined or scoured away from creek flow.

Photo 18. Timber bridge, second bridge to cross after 2nd gate.

Building Type

Per ASCE/SEI 41-17, the closest type of structure this building can be classified as and was used for this evaluation is **Building Type W1: Wood-Light Frames:** As described by ASCE/SEI 41-17: *'These buildings are single- or multiple-family dwellings one or more stories high with plan areas less than or equal to 3,000 ft^2. Building loads are light, and the framing spans are short. Floor and roof framing consist of wood joists or rafters on wood studs spaced no more than 24in. apart. The first floor framing is supported directly on the foundation system or is raised up on cripple studs and post-and-beam supports. The foundation is permitted to consist of a variety of elements. Chimneys, where present, consist of solid brick masonry, masonry veneer, or wood frame with internal metal flues. Seismic forces are resisted by wood frame diaphragms and shear-walls. Floor and roof diaphragms consist of straight or diagonal lumber sheathing, tongue-and-groove planks, oriented strand board, plywood, or other materials. Shear walls are permitted to consist of straight or lumber sheathing, plank siding, oriented strand board, plywood, stucco, gypsum board, particleboard, fiberboard, or similarly performing materials. Interior partitions are sheathed from floor to floor with plaster or gypsum board. Older construction often has open-front garages at the lowest story and is permitted to be split-level.'*

Historical Performance

Plywood roof diaphragm and wood framed shear wall systems have traditionally performed relatively well in earthquake events provided adequate shear wall length is maintained without localized stresses in short wall piers and provided there are no significant plan or vertical discontinuities such as a difference in stiffness between floors in a multi-storied structure. This structure is significantly different than these typical structures, and relies on wood log walls to act as shear walls and lacks a stable foundation system. Therefore, the structure in its current state is expected to perform poorly during a significant earthquake.

Benchmark Buildings

In addition to classifying buildings by type of construction, ASCE 41 identifies 'Benchmark Buildings' for each type. The detailing of seismic force-resisting systems in Benchmark Buildings is generally considered to meet the performance requirements of ASCE 41. When a building is determined to meet Benchmark Building requirements through field verification of construction compliant with benchmark code requirements, only review of foundation and non-structural elements is required. The subject building was constructed in the 1920's, well before the benchmark date for this type of construction. Since it does not meet the criteria of a Benchmark Building, a complete Tier 1 analysis is performed.

FINDINGS AND RECOMMENDATIONS

Structural Seismic Deficiencies

The ASCE 41-17 Tier 1 Collapse Prevention and Building Type Specific Checklists indicate the primary building structure as non-compliant in sixteen (16) areas. These items would all need to be addressed prior to re-occupancy of the building (Option 3). General recommendations to address the deficiencies are summarized below; more specific structural scope items are provided in Option 3 of the *BOD Options and Recommended Repair Narrative* section and Appendix B.

a) LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
   i) Recommendations
      i. Due to lack of redundancy and capacity of existing crawl space bracing, strengthening of the braced bays in the crawl space is required to ensure structural adequacy. Additional braced bays should be provided to increase redundancy and limit brace and foundation demands on any individual elements. At least 1 bay of bracing with braces oriented to resist compression and tension loads should be provided below all exterior wall lines.
      ii. The existing brace connections are inadequate to develop the buckling/yield capacity of the braces. Of concern is the lack of anchorage at the brace to foundation connection which is necessary to resist the vertical reaction from the brace. Complete replacement of the existing deficient braces and their connections is recommended.
      iii. The existing log frame columns and anchorage are inadequate to resist axial forces due to frame overturning. The columns supporting new braced bays should be founded on new concrete footings designed to resist potential uplift and should have positive connections anchoring them to the log poles and bracing elements.
b) WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in the crawl space in each direction is less than 80% of the strength in the story above.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
c) SOFT STORY: The stiffness of the seismic-force-resisting system in crawl space level is less than 70% of the seismic-force-resisting system stiffness in an adjacent story above.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
d) VERTICAL IRREGULARITIES: Vertical elements in the seismic-force-resisting system are not continuous to the foundation.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
e) GEOMETRY: There are changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
f) TORSION: The estimated distance between the story center of mass and the story center of rigidity is more than 20% of the building width in either plan dimension.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
g) REDUNDANCY: The number of lines of shear walls in each principal direction is less than 2 at the crawl space.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.
h) SHEAR STRESS CHECK: There are no shear walls in the crawl space.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.

i) WALLS CONNECTED THROUGH FLOORS: Existing shear (log) walls do not have an interconnection between stories to transfer overturning and shear forces through the floor.
   i) Recommendation: At all new braced bays, steel fasteners and hardware should be used to positively connect the walls to the bracing at the crawl space below.

j) HILLSIDE SITE: The structure is taller on one side by more than one-half the story height because of a sloping site. There are no shear walls on the downhill slope that have an aspect ratio less than 1-to-1.
   i) Recommendation: Portions of the foundation along parts of S-W ends of grid lines 1 & A are very short where the crawl space is less than 2 feet tall. These elements are likely contributing substantially to the building's seismic capacity. This hillside condition results in the presence of stiffer elements at the uphill corner of the building and results in a torsional irregularity. The final design and layout of the bracing should account for this issue when proportioning the retrofit elements.

k) CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are not braced to the foundation with wood structural panels.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.

l) WOOD POSTS: There is no positive connection of wood posts to the foundation.
   i) Recommendation: The columns supporting all gravity and lateral resisting log and timber posts should be founded on new concrete footings and should have positive connections anchoring them to the new spread footings.

m) WOOD SILLS: No wood sills are bolted to the foundation.
   i) Recommendation: The base of the walls should be anchored to the new cripple wall braced frames.

n) WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with proper edge and end distance provided for wood and concrete are not present. Addressing deficiency noted in item (j) above would resolve this deficiency.
   i) Recommendation: The base of the walls should be anchored to the new cripple wall braced frames.

o) GIRDER/COLUMN CONNECTION: No positive connections are present at the girder/column connections.
   i) Positive connections using plates, connection hardware, or straps between the girder and the column supports should be provided.

p) SPANS: All wood diaphragms with spans greater than 24 ft do not consist of wood structural panels or diagonal sheathing.
   i) Recommendation: Implementation of Item (a) above would address this deficiency.

<u>Structural Gravity Deficiencies</u>

a. Significant settlement of the N-W corner of the building is evident at line 1-D, see Photos 2 and 9. Periodic structural repairs appear to have been made within the buildings crawl space as noted in previous sections. There are (3) widely spaced isolated timber piers along line 1 which show evidence of settlement and rotation indicating they are founded on inadequate bearing material or undersized footings. These settlements have likely contributed to the instability of the North gable end wall above. See BOD summaries below for specific stabilization recommendations for each option.
b. It appears the building was originally founded on 12" to 18" diameter log poles embedded directly into the native soil. As discussed in the geotechnical report the embedment depth of the log poles into the soil is uncertain. The log poles at the building's interior which have remained relatively dry are still mostly intact, though at many locations significant rot and decay is observable in the post bases that are set into grade (see Photo 5). Below locations where the bearing log walls occur above, supplemental posts appear to have been added, resulting in sections of tightly grouped log posts. Along grid line 3 nearly all the original log posts appear to have been replaced with heavy sawn lumber posts, typically built up with 2 to 3 - 4x or

6x members (see Photo 16) that do not appear to be positively anchored or well connected. These post bases are set on small concrete spread footings and many have had 2x brace elements added to them. See BOD summaries below for specific stabilization recommendations for each option.

c. The north, west and south edges of the deck have fully or partially collapsed areas, see Photos 2 thru 5. The Eastern portion of the deck is framed with modern pressure treated sawn lumber materials indicating it is of more recent construction and appears to be in near serviceable condition. See BOD summaries below for specific stabilization recommendations for each option.
d. Many of the deck railings are missing or failing, and all are non-compliant with code regulations, see Photos 1- thru 4. See BOD summaries below for specific stabilization recommendations for each option.
e. Evidence of termites, wood rats and other pests were observed. It can be seen from the exterior that there is some “sag” to the existing roof framing, particularly north of line C, likely as a result of the settlement noted in previous sections. We strongly suggest a structural pest / termite / dry rot inspection be performed by a licensed contractor specialized in this type of work and any identified deficiencies be remediated. The horizontal logs at the base of the walls, especially along grid line D show signs of significant rot, see Photo (9).
f. Locations where the log walls penetrate through the floors, gaps appear to have opened, allowing rodents to enter the building. These gaps should be filled.
g. The connection of the floor framing to the log walls and vertical pole substructure should be improved as part of option 3 which would trigger a seismic retrofit, see Photo 5, 9 & 10.
h. In general, the log walls appear to be in good condition. However localized insect damage was observed primarily localized at the base of the log walls in the lower 3 courses (see Photo 6 & 7). An extensive inspection and treatment plan should be completed by a licensed pest control specialist.
i. Gaps have developed between logs due to settlement, shrinkage and loss of the caulk/ fill material. These gaps should be re-filled as part of wildlife exclusion measures. See Photos 11, 14 & 15 for representative examples.
j. At the corners of the building, the interlocking horizontal logs extend beyond the face of wall. The ends of these logs have less protection from the roof overhangs, and many of the lower logs have experienced significant damage and deterioration, see Photo 6. The short pieces of shaped logs at the ends of the sawn beams have in some cases experienced significant deterioration and have become detached. For BOD option 3 any members that have significant rot or decay as identified by a structural pest inspection specialist should be replaced in kind.
k. The horizontal logs at the gable end walls are only attached to the roof above the eave elevation. Due to lack of positive connection, these logs may become unstable if continued settlement occurs or during an earthquake event and could be a significant falling hazard, see Photos 2 & 9. These logs require additional connections as part BOD option 3 which would trigger a mandatory gravity framing and seismic retrofit. Additional structural elements on the interior face of the wall would be required.
l. The interior log walls do not extend to the underside of the roof and do not appear to have been intended as bearing walls in their original state, however at one location between grids 2-3 a truss bottom chord is bearing directly onto the partial height log wall, likely as a result of the ongoing settlement of the building. This has resulted in a redistribution of loading where the top chord of the truss is no longer in compression and a gap has opened in the truss connection at the roof (see Photo 12).
m. The roofing finish is wood shake shingles with no gutter system at the edge of the roof eave. This condition allows runoff from the roof to wet the lower courses of horizontal log framing and to percolate thru the soils below the building, likely exacerbating the rot/decay observed int the log framing.

BOD Options and Recommended Repair Narrative

Recommendations for the following options are also shown in the conceptual structural drawings in Appendix A of this report.

BASIS OF DESIGN ALTERNATIVE #1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from distance. (See drawings 1-S2.1)

1) Install a secure chain-link fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.

BASIS OF DESIGN ALTERNATIVE #2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure. (See drawings 2-S2.1 through 2-S2.2)

The stabilization methods recommended specifically target only the gravity related structural deficiencies and would not allow for re-occupancy of the building. The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented. These stabilization elements are not limited to elements installed only within the interior of the building. (See drawings 2-S2.1 & S2.2)

1) Install pressure treated wood cribbing for shoring at all locations indicated on foundation plan for option 2. Stabilization shoring in a minimum 2x pattern in accordance with US Army Corp of Engineers (or equivalent) is recommended for the cribbing shores.
2) All failed or failing portions of the existing porch framing and railings (assume north, west and south ends) should be repaired or demolished and replaced in-kind.
3) If it's not desirable for the perimeter access to the site to be fenced in per Option 1, it is recommended that all 25 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with ¾" plywood rated for exterior exposure positively anchored with galvanized fasteners. This plywood should be assumed to be painted to match existing exterior wall color to minimize the visual impact of this option.
4) Follow the *Mothballing Guidelines* including:
    a. Secure the building and its component features to reduce vandalism or break-ins.
    b. Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
    c. Provide adequate ventilation to the interior.
    d. Secure or modify utilities and mechanical systems.
    e. Develop and implement a maintenance and monitoring plan for protection.

BASIS OF DESIGN ALTERNATIVE #3: Repair and rehabilitate the structure for reuse as a retreat space, meeting space, or hikers hut. (See Drawings 3-S2.1 through 3-S2.3)

The stabilization methods proposed for this option target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code (2016 or 2019 California Historical Building Code) to allow for re-occupancy of the existing building. It is assumed that the current occupancy category of the building is Group B - Residential Occupancy which allows for assembly spaces of less than 750 square feet; therefore, use of the common room as a meeting space would likely not require a change of occupancy. (See drawings 3-S2.1 through 3-S2.3)

1) Replace majority (assume 60%) of the existing porch and railing framing in conformance with strength and attachment requirements of 2016 CBC Section 1607.8 as outlined in the condition assessment report.
2) Replace select rotted timbers. Assume the lower three courses of horizontal logs in all exterior walls as well as 48" from the ends of all corner logs. Assume shoring and underpinning is required for this option.
3) The settled portion of the structure should be underpinned and lifted as close as possible back to its original (level) position. The cribbed shoring recommended for Option 2 may be used as lifting points for jacking operations. New 36" square by 42" deep concrete spread footings should be installed below all existing timber posts that are currently resting directly on grade. The existing rotted ends of all existing posts should be trimmed to remove deteriorated material (up to 12" maximum) above existing grade and treated or sealed to limit further decay prior to installation of new pad footings. Positive anchorages shall be cast into the footings to connect to the log poles with galvanized steel base plates with knife plates and anchor bolts. A combination of compact light excavation equipment and hand digging should be assumed necessary for installation of new foundation elements.
4) Wall out-of-plane strengthening using 6x posts at interior face of wall spaced at 8 feet on center. Fasten posts to logs with 0.22"x15" Simpson lag screws (2) per log every course. Assume posts are anchored at the base and top to the underside of the floor and roof diaphragms respectively.
5) Provide continuous foundation tie beams in line with 4x10 pressure treated timber brace elements in the crawls space between existing support posts ((8) locations).
6) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.
7) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.
8) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.
9) Optional: Install motion activated cameras and signage at the site as an additional security measure; additional maintenance costs for these measures should be considered.

BASIS OF DESIGN ALTERNATIVE #4: Remove the structure and restore the underlying natural resources. (See drawing 4-S2.1)

- Assume 60 tons of wood materials would need to be removed from the site.
- Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.
- The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.
- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

RELIABILITY OF SEISMIC EVALUATIONS

In general, structural engineers do not have the ability to predict the exact damage to a building as a result of an earthquake. There will be a wide variation of damage from building to building due to the variations in ground motion and varying types and quality of construction. In addition, engineers cannot predict the exact ground motions of the earthquake that may strike a given building. Design and evaluation of buildings are performed using general guidelines and information from past earthquakes. Engineers and the codes used for design and evaluation have been conservative when attempting to ensure that building design meets minimum standards of Collapse Prevention. This effort is based on science and technology as well as on observations made from actual seismic events. Building design and evaluation codes are constantly evolving to better meet performance targets based on this information. Continued research will improve predictive methods and facilitate performance-based engineering. It has been estimated that, given design ground motions, a small percent of new buildings and a slightly greater percent of retrofit buildings may fail to meet their expected performance.

CLOSING

The structural condition assessment, seismic review, analysis and BOD associated with this evaluation were based on the site review of framing and elements of the building which are plainly visible. No attempt was made to uncover hidden conditions or perform any destructive or non-destructive testing. The items discussed in this report are subject to revision should more information become available.

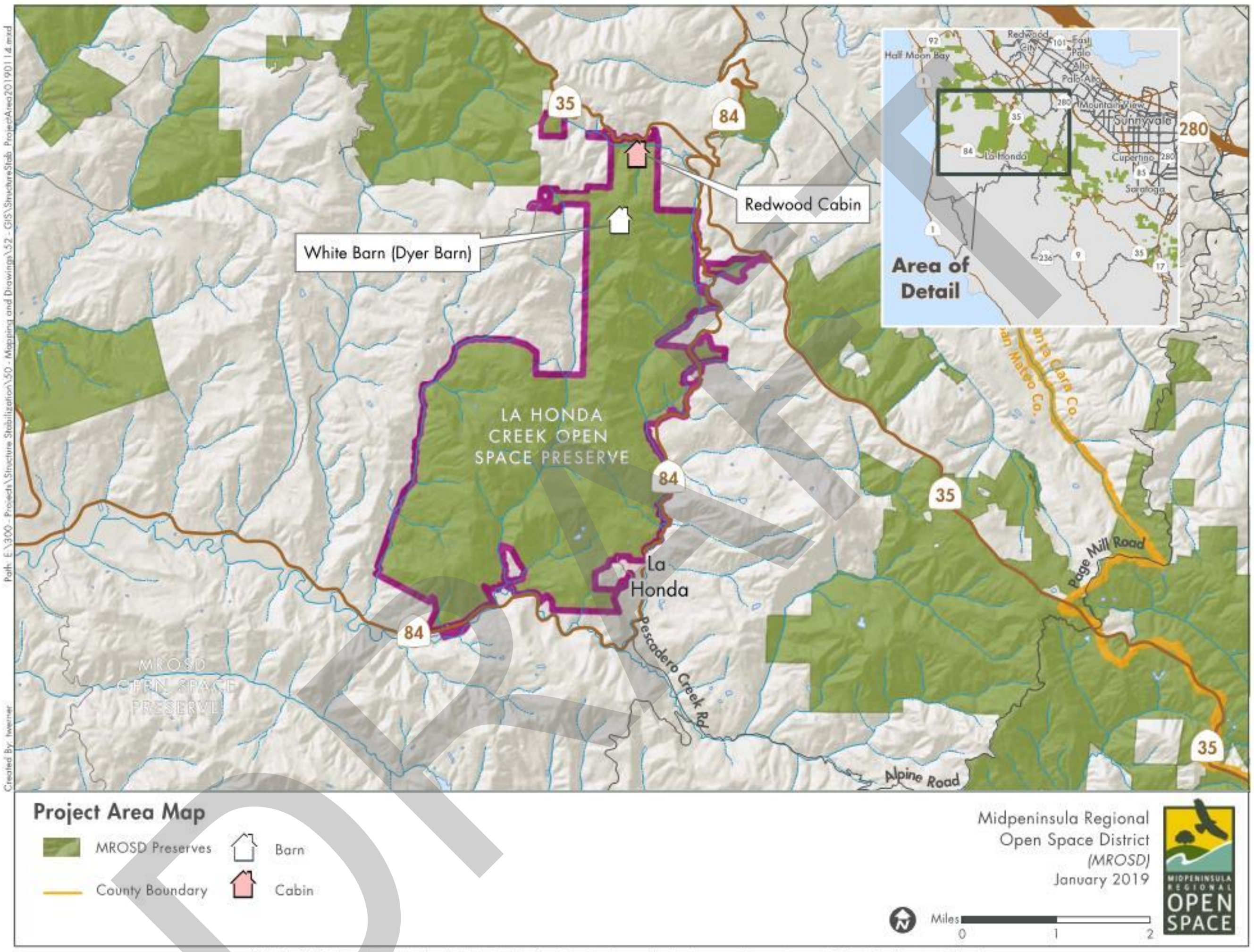
This report is general in nature and does not imply that the recommendations listed above are the only structural requirements that must be made to the existing structure to meet current code criteria.

We understand you may have questions regarding this evaluation and are available for comment and explanations. Please call with any questions you may have. Thank you for choosing ZFA Structural Engineers to assist you with this building seismic and structural stabilization review.

Steven Patton, SE
Senior Associate

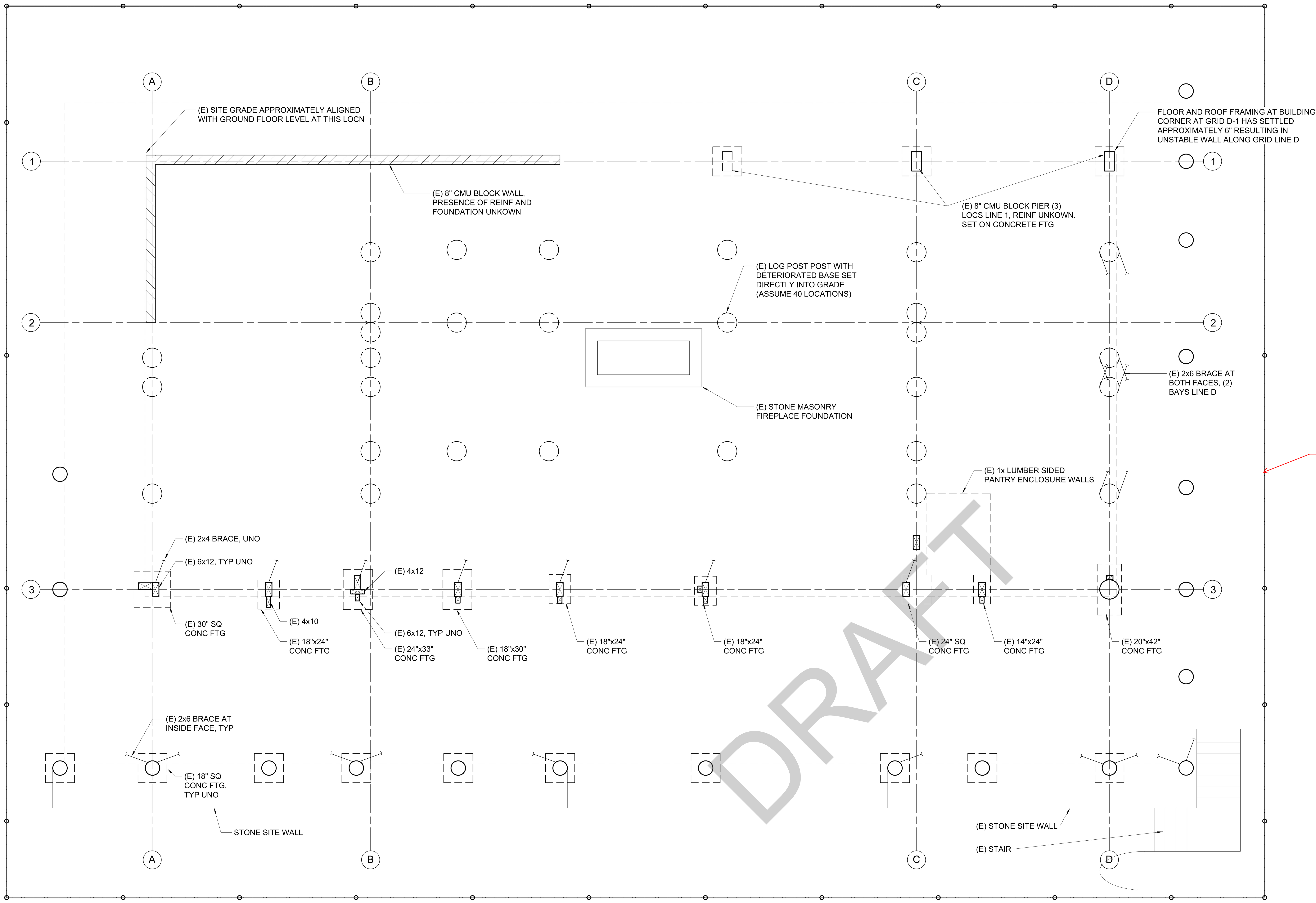
Mark Moore, SE
Executive Principal

APPENDIX A – SITE MAP



While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

APPENDIX B – STRUCTURAL STABILIZATION BASIS OF DESIGN ALTERNATIVES



NORTH

EXISTING FOUNDATION PLAN BOD OPTION 1

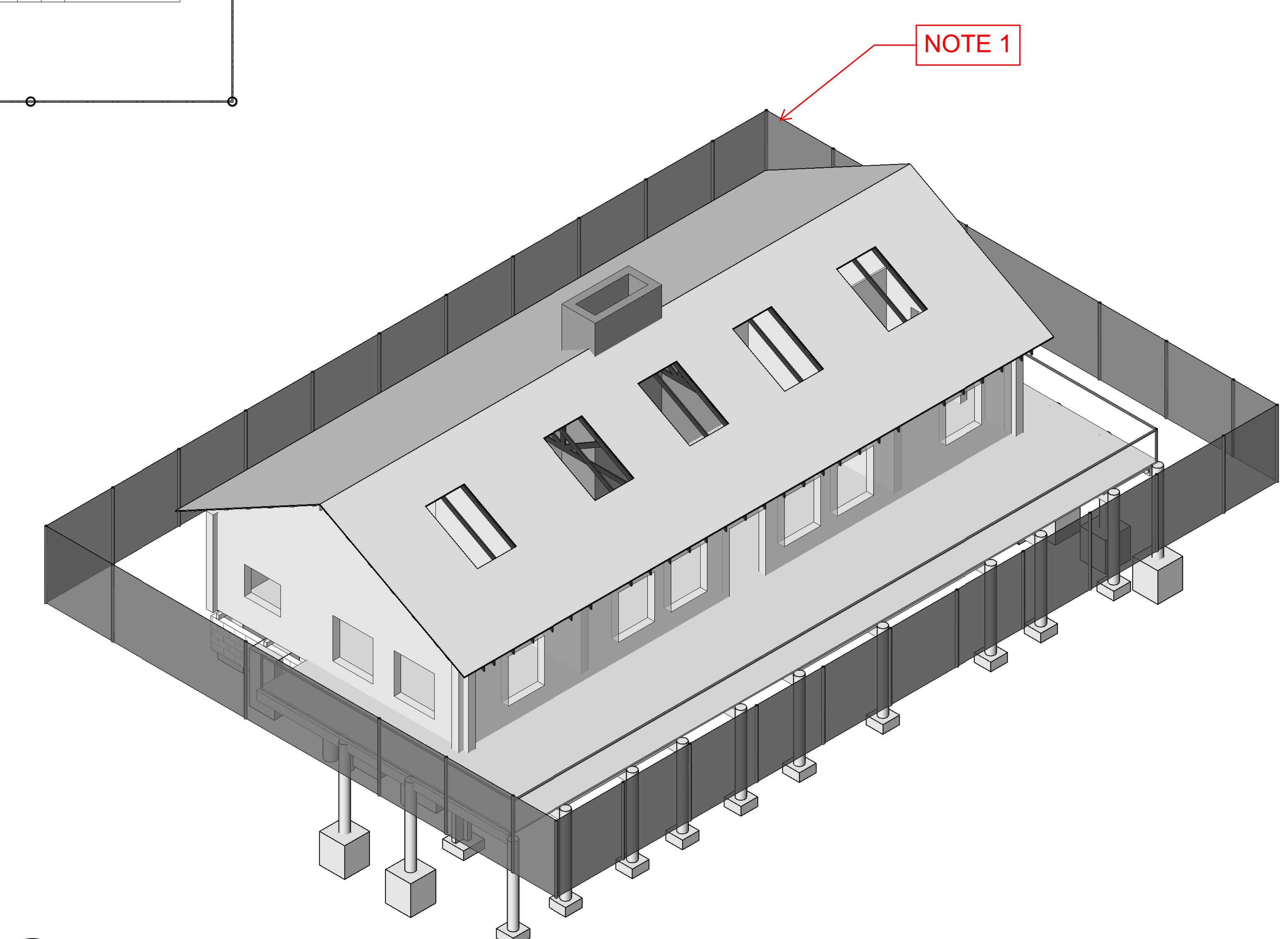
1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 1

1) Install a secure fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access.

2) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

3) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:38 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 1
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

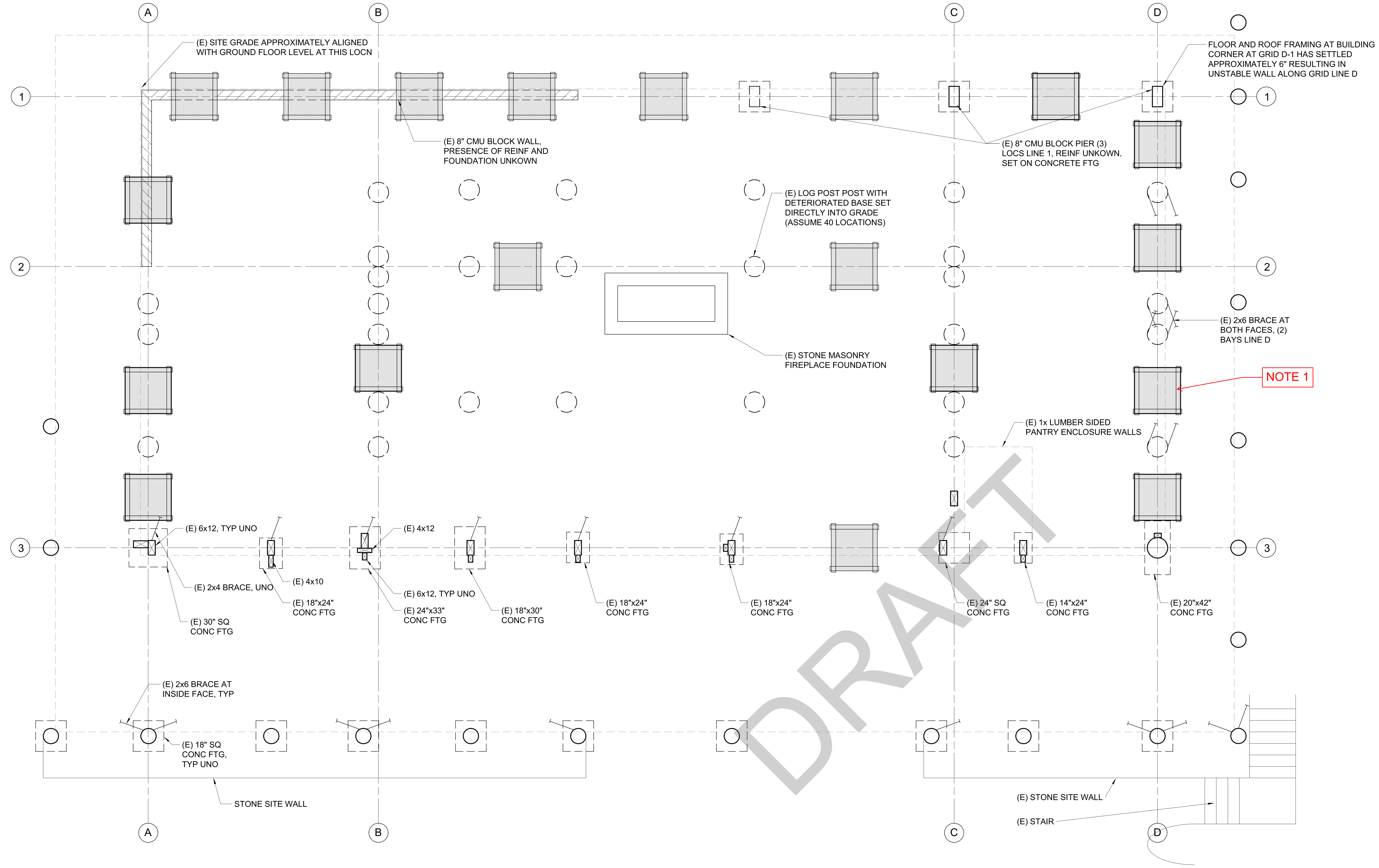
SHEET DESCRIPTION

FOUNDATION PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

1-S2.1



EXISTING FOUNDATION PLAN BOD OPTION 2
1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 2

1) Install pressure treated wood cribbing for shoring at all locations indicated on foundation plan for Option 2.

2) All failed or failing portions of the existing porch framing and railings (assume north, west and south ends) should be repaired or demolished and replaced in-kind.

3) If it's not desirable for the perimeter access to the site to be fenced in per Option 1, it is recommended that all 25 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.

4) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a) Secure the building and its component features to reduce vandalism or break-ins.
b) Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
c) Provide adequate ventilation to the interior.
d) Secure or modify utilities and mechanical systems.
e) Develop and implement a maintenance and monitoring plan for protection.

5) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

6) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.

7) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

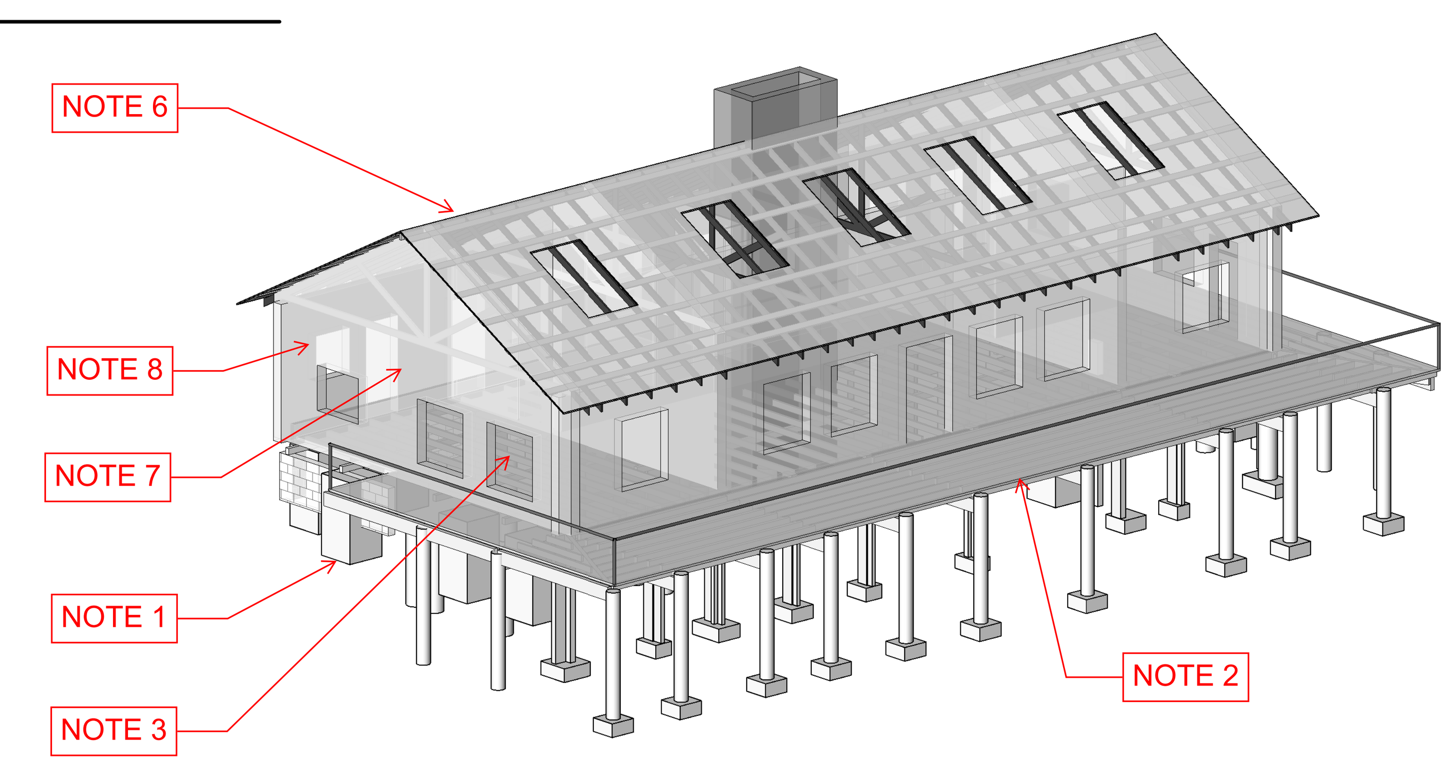
8) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.

9) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

10) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

11) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

12) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:44 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 1

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 2
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

SHEET DESCRIPTION

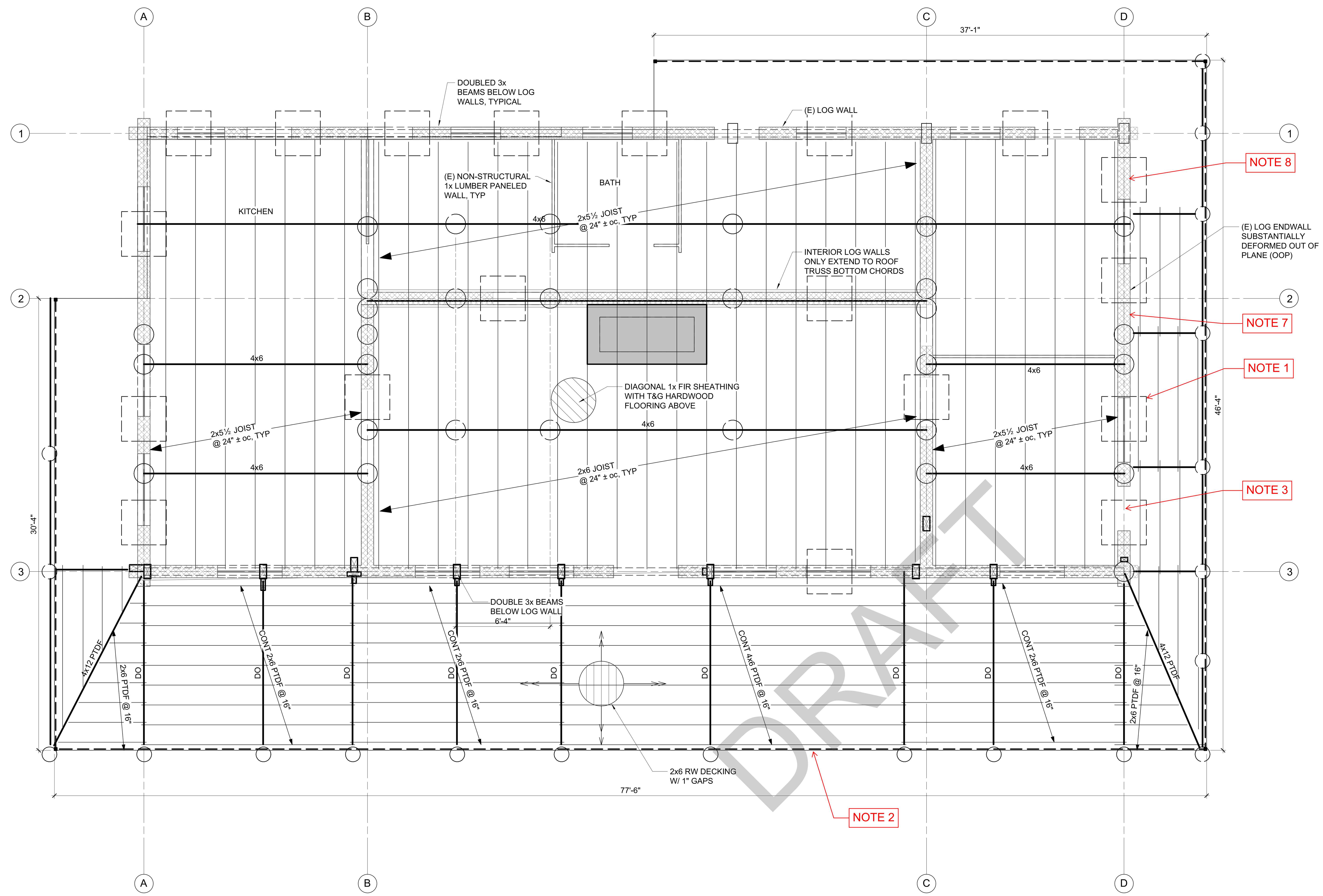
FOUNDATION PLAN

ENGR: SRP
DATE: NOV 22, 2019
PM: SRP

SHEET

2-S2.1

Attachment 1



(E) FLOOR FRAMING PLAN BOD OPTION 2

1/4" = 1'-0"

NORTH

BASIS OF DESIGN: ALTERNATIVE 2

1) Install pressure treated wood cribbing for shoring at all locations indicated on foundation plan for Option 2.

2) All failed or failing portions of the existing porch framing and railings (assume north, west and south ends) should be repaired or demolished and replaced in-kind.

3) If it's not desirable for the perimeter access to the site to be fenced in per Option 1, it is recommended that all 25 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.

4) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a) Secure the building and its component features to reduce vandalism or break-ins.
b) Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
c) Provide adequate ventilation to the interior.
d) Secure or modify utilities and mechanical systems.
e) Develop and implement a maintenance and monitoring plan for protection.

5) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

6) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.

7) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

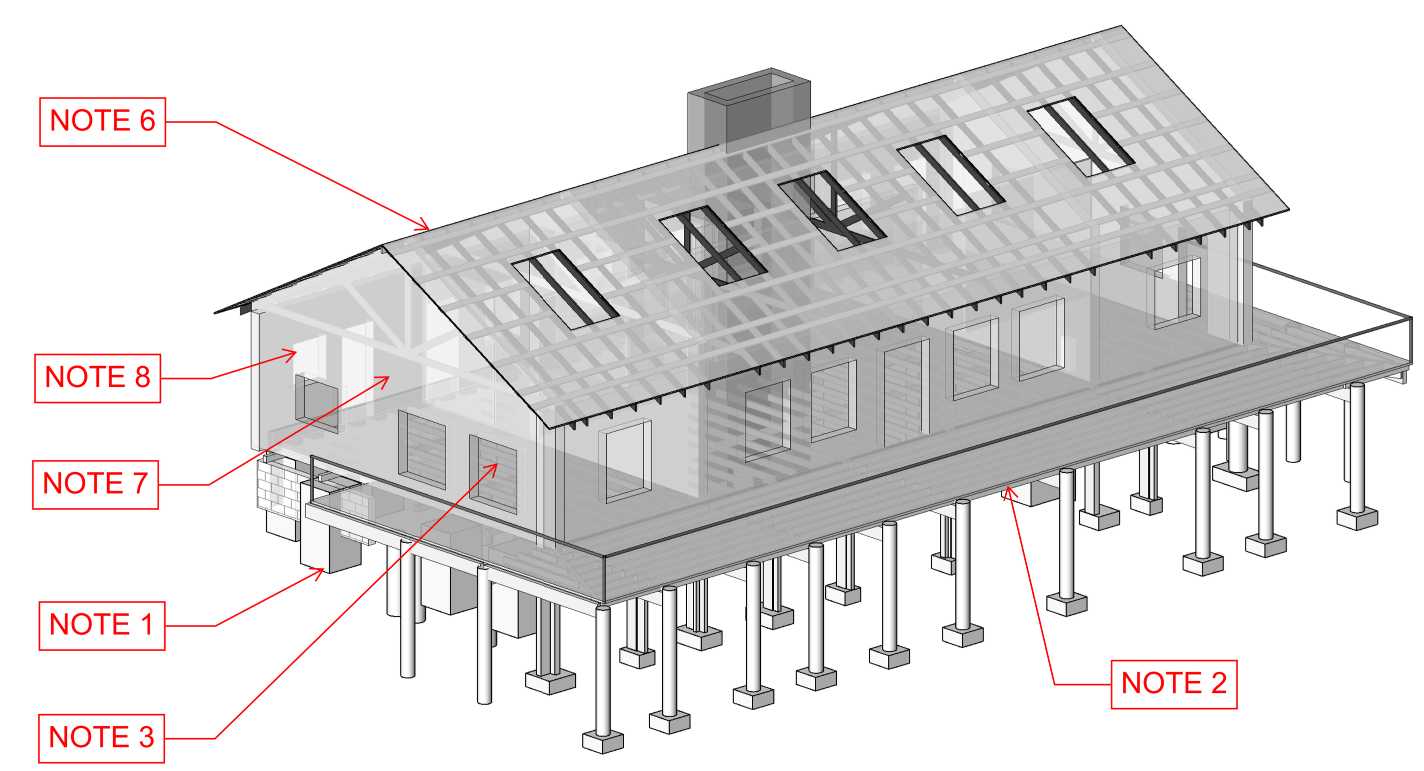
8) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.

9) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

10) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

11) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

12) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:47 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 2
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

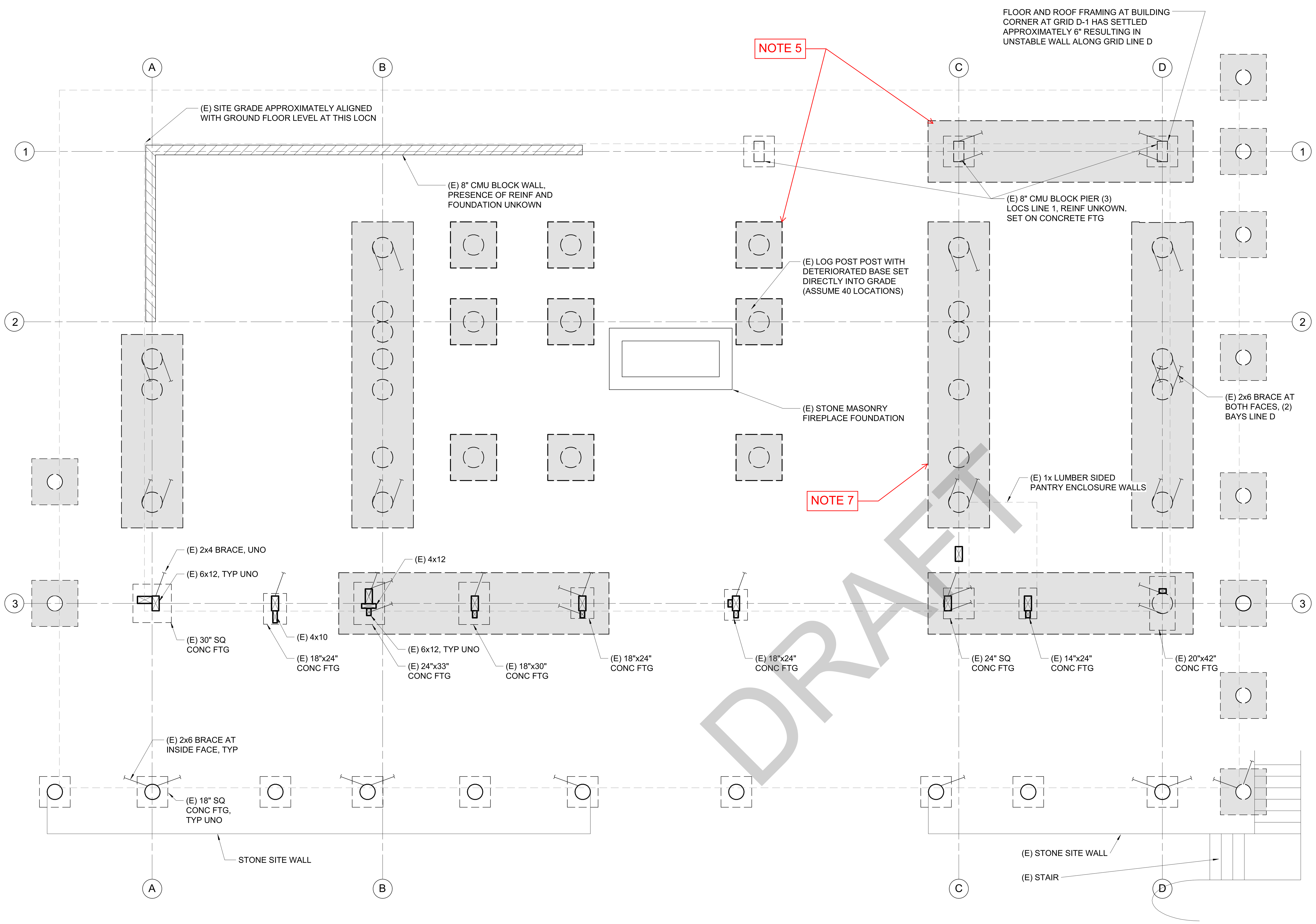
SHEET DESCRIPTION

FLOOR FRAMING PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

2-S2.2



EXISTING FOUNDATION PLAN BOD OPTION 3

1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 3

1) While the Redwood Cabin is currently unoccupied, the Basis of Design assumed that the current occupancy is classified as Residential with a maximum occupancy of nine (9) people.

2) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

3) Replace deteriorated portions of the existing porch and railing framing (assume 60%) in conformance with strength and attachment requirements of 2016 CBC Section 1607.8.

4) Complete replacement of select rotted timbers. Assume the lower three courses of horizontal logs in all exterior walls as well as 48" from the ends of all corner logs. Assume shoring and underpinning is required for this option.

5) The settled portion of the structure should be underpinned and lifted as close as possible back to its original (level) position. The cribbed shoring recommended for Option 2 may be used as lifting points for jacking operations. New 36" square by 42" deep concrete spread footings should be installed below all existing timber posts that are currently resting directly on grade. The existing rotted ends of all existing posts should be trimmed to remove deteriorated material (up to 12" maximum) above existing grade and treated or sealed to limit further decay prior to installation of new pad footings. Positive anchorages shall be cast into the footings to connect to the log poles with galvanized steel base plates with knife plates and anchor bolts. A combination of compact light excavation equipment and hand digging should be assumed necessary for installation of new foundation elements.

6) Install new 6x posts at interior face of log walls spaced at 8 feet on center.

7) Provide continuous foundation tie beams in line with 4x10 pressure treated timber brace elements in the crawls space between existing support posts ((8) locations).

8) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.

9) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

10) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.

11) Improve accessibility to allow vehicular access to the southwest corner of the building or develop a switch-backed ramp in the landscape on the southeastern side of the building.

12) Modify the door at the southwest corner of the building to provide the necessary width and door hardware.

13) In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Option 2, the following work should be anticipated for cost estimation purposes:
a) Upgrade and reconnect plumbing and electrical service.
b) Verify safety of consumption of the existing source of water at the site. Assume construction of new septic and potable water systems. Per county records, the existing septic tank has been demolished.
c) Provide new flooring toilet, lavatory, and shower/bath in bathroom.
d) Provide new cabinetry, sink, fixtures, oven and stove in kitchen.
e) Restore the existing antique stove including replacement of flu and roof penetration repairs.
f) The floors are assumed to require repair in areas where there has been rodent habitation or water intrusion, and gentle refinishing is assumed to be required throughout.

14) Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.

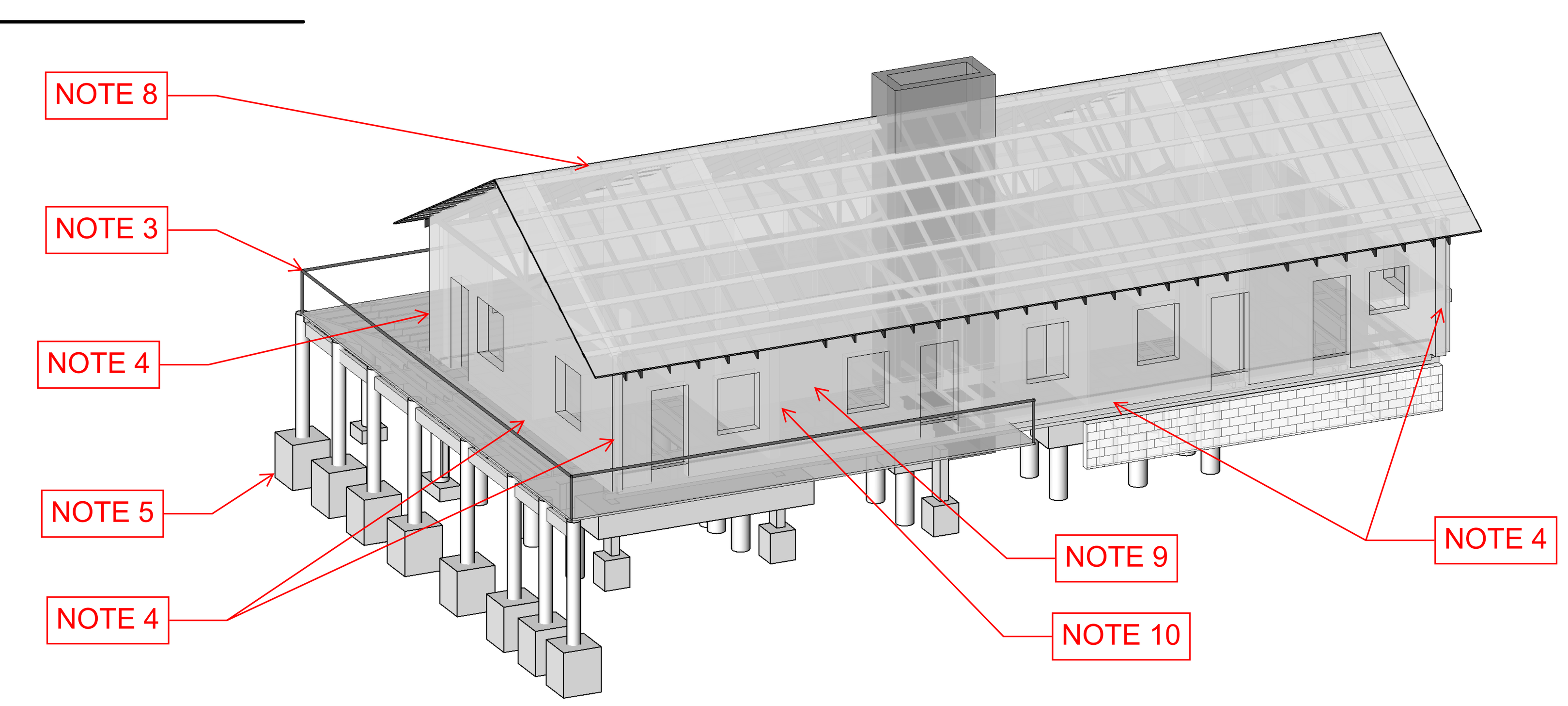
15) Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.

16) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

17) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

18) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

19) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_jleos@zfa.com.rvt

11/22/2019 1:46:48 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

SHEET DESCRIPTION

FOUNDATION PLAN

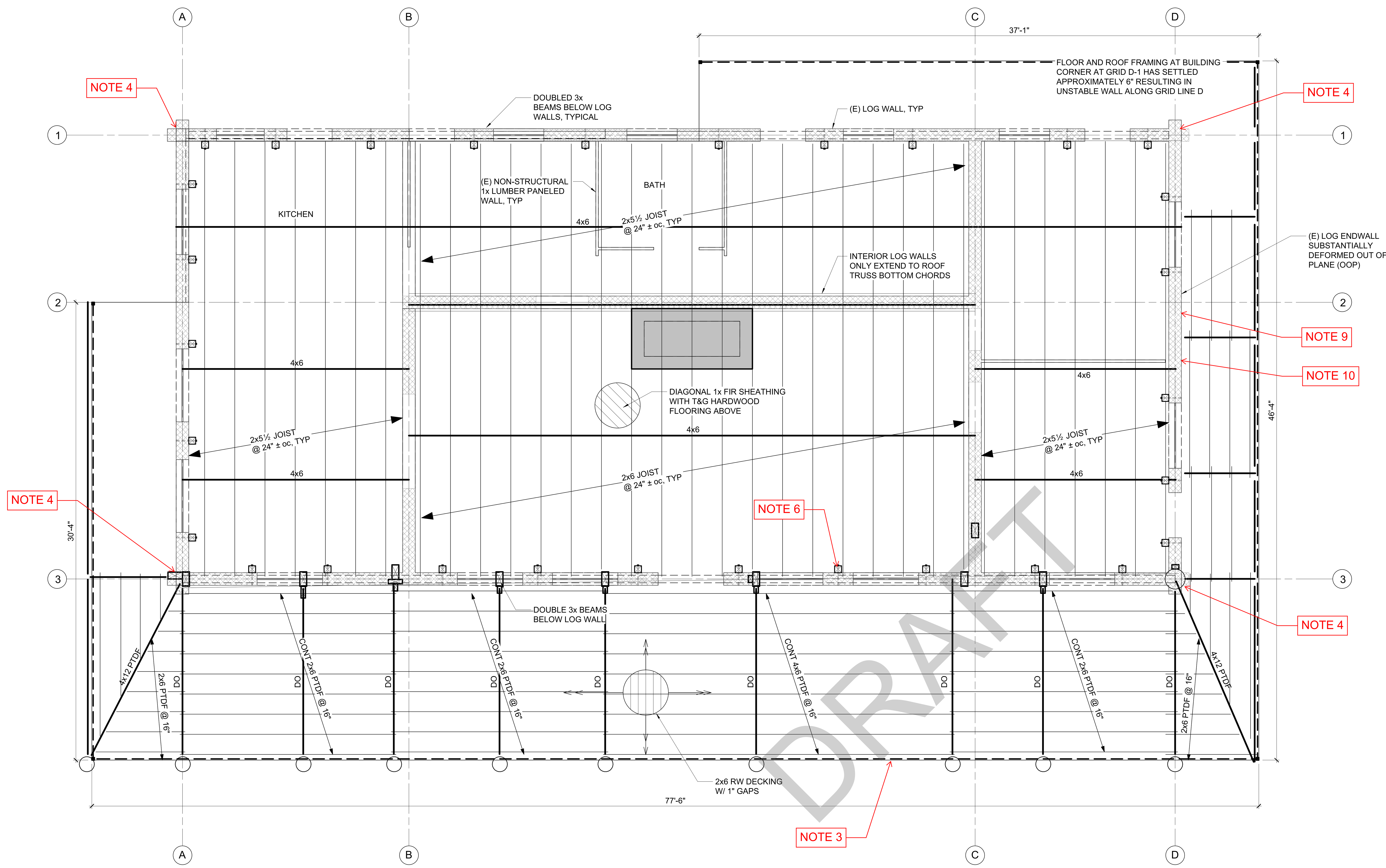
ENGR: SRP

DATE: NOV 22, 2019

PM: SRP

SHEET

3-S2.1



(E) FLOOR FRAMING PLAN BOD OPTION 3

1/4" = 1'-0"

NORTH

BASIS OF DESIGN: ALTERNATIVE 3

1) While the Redwood Cabin is currently unoccupied, the Basis of Design assumed that the current occupancy is classified as Residential with a maximum occupancy of nine (9) people.

2) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

3) Replace deteriorated portions of the existing porch and railing framing (assume 60%) in conformance with strength and attachment requirements of 2016 CBC Section 1607.8.

4) Complete replacement of select rotted timbers. Assume the lower three courses of horizontal logs in all exterior walls as well as 48" from the ends of all corner logs. Assume shoring and underpinning is required for this option.

5) The settled portion of the structure should be underpinned and lifted as close as possible back to its original (level) position. The cribbed shoring recommended for Option 2 may be used as lifting points for jacking operations. New 36" square by 42" deep concrete spread footings should be installed below all existing timber posts that are currently resting directly on grade. The existing rotted ends of all existing posts should be trimmed to remove deteriorated material (up to 12" maximum) above existing grade and treated or sealed to limit further decay prior to installation of new pad footings. Positive anchorages shall be cast into the footings to connect to the log poles with galvanized steel base plates with knife plates and anchor bolts. A combination of compact light excavation equipment and hand digging should be assumed necessary for installation of new foundation elements.

6) Install new 6x posts at interior face of log walls spaced at 8 feet on center.

7) Provide continuous foundation tie beams in line with 4x10 pressure treated timber brace elements in the crawls space between existing support posts ((8) locations).

8) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.

9) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

10) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.

11) Improve accessibility to allow vehicular access to the southwest corner of the building or develop a switch-backed ramp in the landscape on the southeastern side of the building.

12) Modify the door at the southwest corner of the building to provide the necessary width and door hardware.

13) In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Option 2, the following work should be anticipated for cost estimation purposes:
a) Upgrade and reconnect plumbing and electrical service.
b) Verify safety of consumption of the existing source of water at the site. Assume construction of new septic and potable water systems. Per county records, the existing septic tank has been demolished.
c) Provide new flooring toilet, lavatory, and shower/bath in bathroom.
d) Provide new cabinetry, sink, fixtures, oven and stove in kitchen.
e) Restore the existing antique stove including replacement of flu and roof penetration repairs.
f) The floors are assumed to require repair in areas where there has been rodent habitation or water intrusion, and gentle refinishing is assumed to be required throughout.

14) Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.

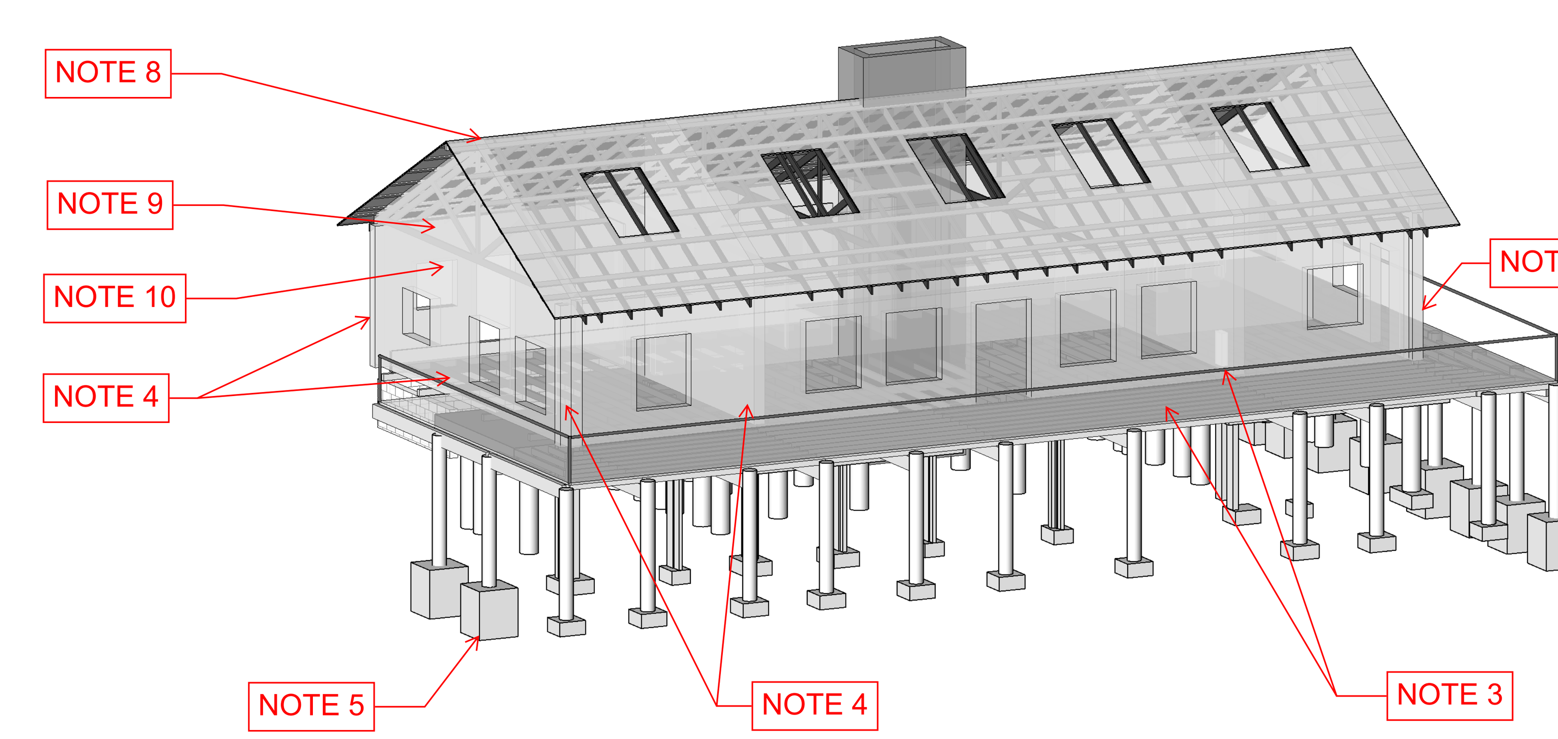
15) Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.

16) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

17) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

18) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

19) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISOMETRIC VIEW

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:50 PM

Attachment 1

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

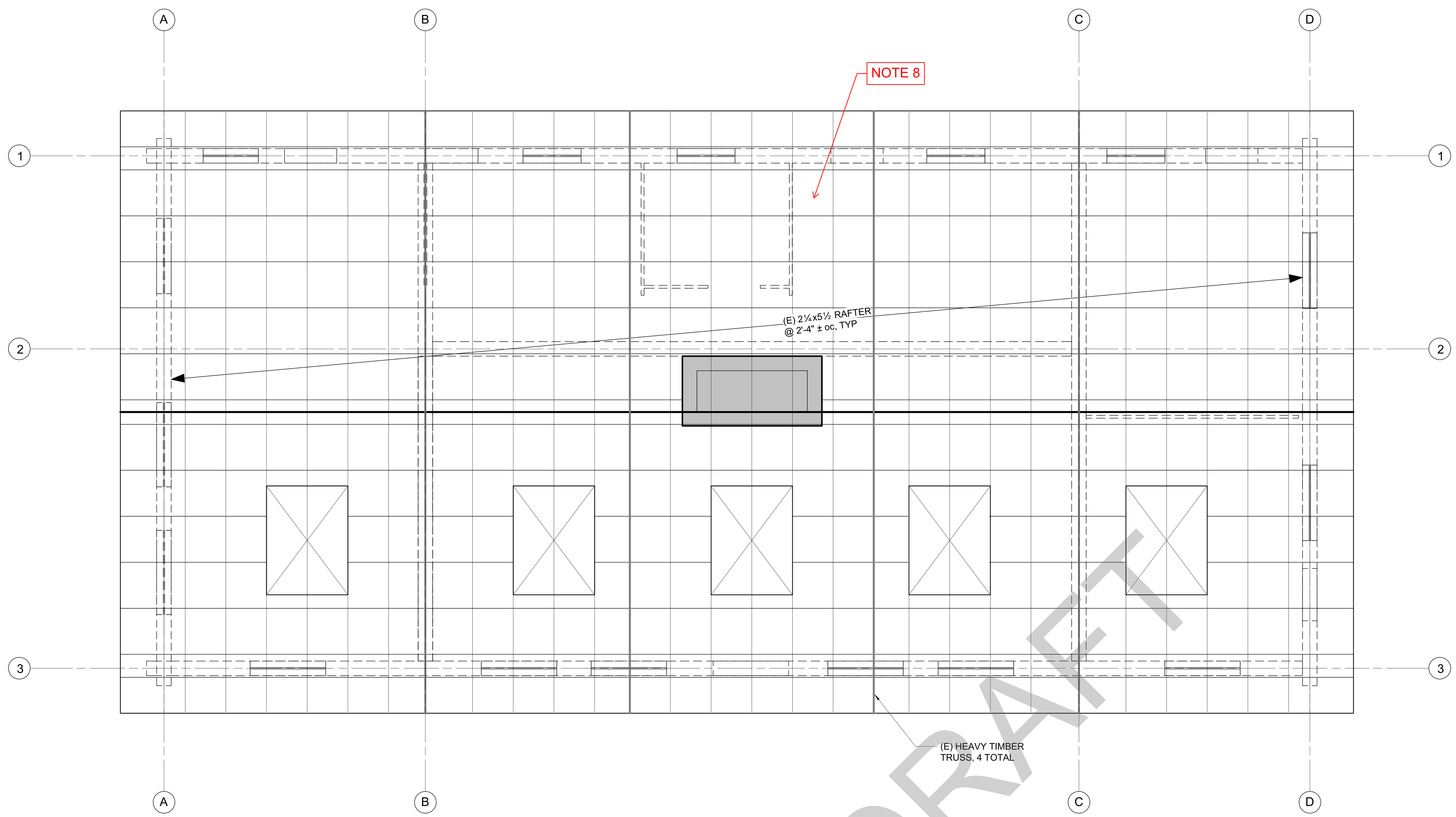
SHEET DESCRIPTION

FLOOR FRAMING PLAN

ENGR: SRP
DATE: NOV 22, 2019
PM: SRP

SHEET

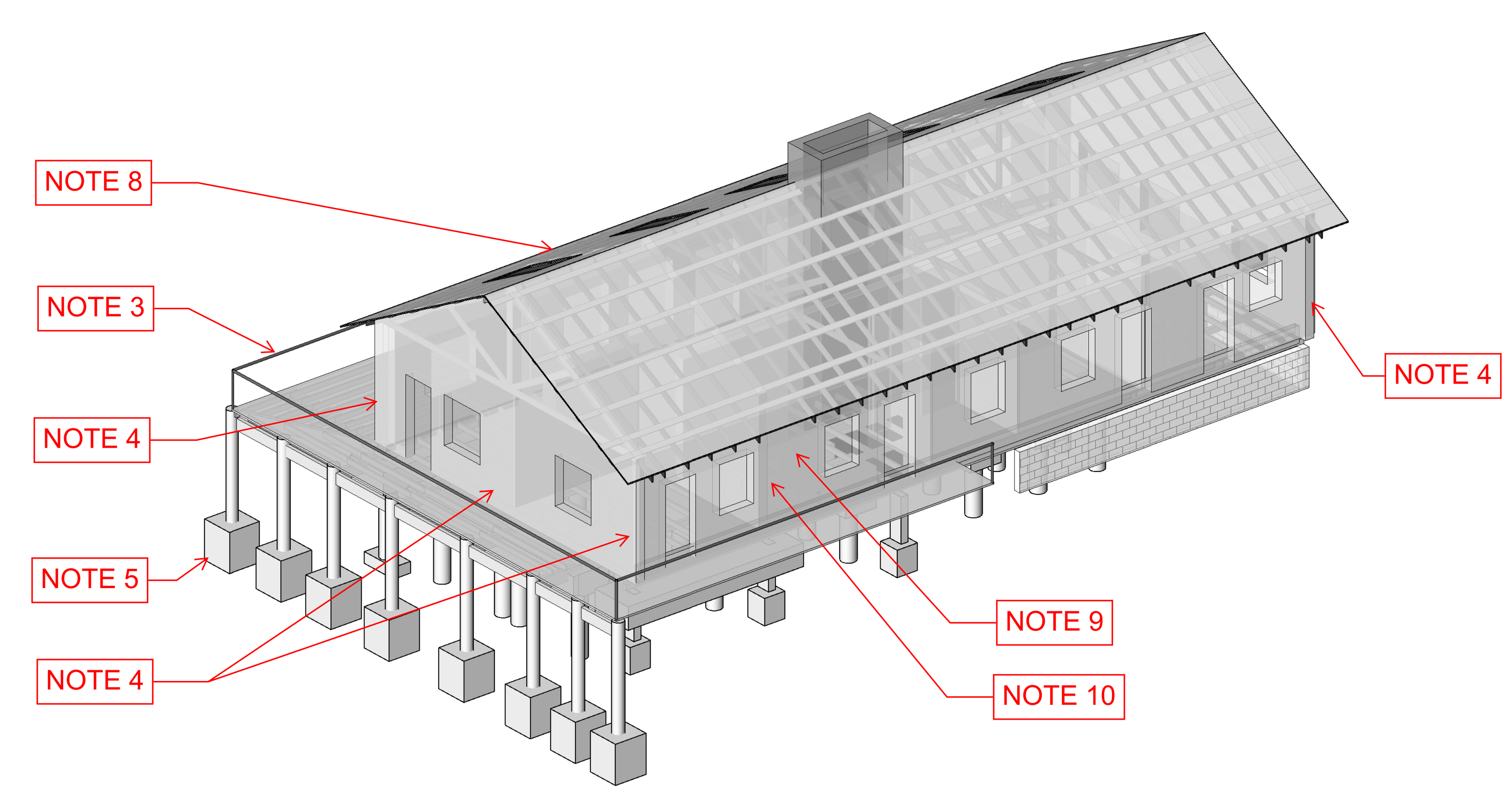
3-S2.2



NORTH

ROOF FRAMING PLAN BOD OPTION 3

1/4" = 1'-0"



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:56 PM

BASIS OF DESIGN: ALTERNATIVE 3

1) While the Redwood Cabin is currently unoccupied, the Basis of Design assumed that the current occupancy is classified as Residential with a maximum occupancy of nine (9) people.

2) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

3) Replace deteriorated portions of the existing porch and railing framing (assume 60%) in conformance with strength and attachment requirements of 2016 CBC Section 1607.8.

4) Complete replacement of select rotted timbers. Assume the lower three courses of horizontal logs in all exterior walls as well as 48" from the ends of all corner logs. Assume shoring and underpinning is required for this option.

5) The settled portion of the structure should be underpinned and lifted as close as possible back to its original (level) position. The cribbed shoring recommended for Option 2 may be used as lifting points for jacking operations. New 36" square by 42" deep concrete spread footings should be installed below all existing timber posts that are currently resting directly on grade. The existing rotted ends of all existing posts should be trimmed to remove deteriorated material (up to 12" maximum) above existing grade and treated or sealed to limit further decay prior to installation of new pad footings. Positive anchorages shall be cast into the footings to connect to the log poles with galvanized steel base plates with knife plates and anchor bolts. A combination of compact light excavation equipment and hand digging should be assumed necessary for installation of new foundation elements.

6) Install new 6x posts at interior face of log walls spaced at 8 feet on center.

7) Provide continuous foundation tie beams in line with 4x10 pressure treated timber brace elements in the crawls space between existing support posts ((8) locations).

8) Repair roof as required for waterproofing. The roof should be replaced at or before the end of its service life.

9) The chinking between the logs that form the exterior walls should be inspected and repaired as necessary with a compatible material to the existing to provide a waterproof exterior.

10) The logs of the cabin, which are currently highly susceptible to insects, may need to be treated to address the current insect infestation and prevent future ones; however, this may not be acceptable within the greater conservation practices of the District.

11) Improve accessibility to allow vehicular access to the southwest corner of the building or develop a switch-backed ramp in the landscape on the southeastern side of the building.

12) Modify the door at the southwest corner of the building to provide the necessary width and door hardware.

13) In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Option 2, the following work should be anticipated for cost estimation purposes:
a) Upgrade and reconnect plumbing and electrical service.
b) Verify safety of consumption of the existing source of water at the site. Assume construction of new septic and potable water systems. Per county records, the existing septic tank has been demolished.
c) Provide new flooring toilet, lavatory, and shower/bath in bathroom.
d) Provide new cabinetry, sink, fixtures, oven and stove in kitchen.
e) Restore the existing antique stove including replacement of flu and roof penetration repairs.
f) The floors are assumed to require repair in areas where there has been rodent habitation or water intrusion, and gentle refinishing is assumed to be required throughout.

14) Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.

15) Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.

16) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

17) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

18) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

19) Nesting bird surveys are required if work takes place between February 15 and August 30.

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 1

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

SHEET DESCRIPTION

ROOF FRAMING PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

3-S2.3

BASIS OF DESIGN: ALTERNATIVE 4

1) Demolishing the structure, if determined to be an historic resource, may require additional processes to obtain demolition permits.

2) Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.

3) The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.

4) Remove and provide maintenance to the trees identified in the arborist report by Kielty Arborist Services (see Exhibit H).

5) Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

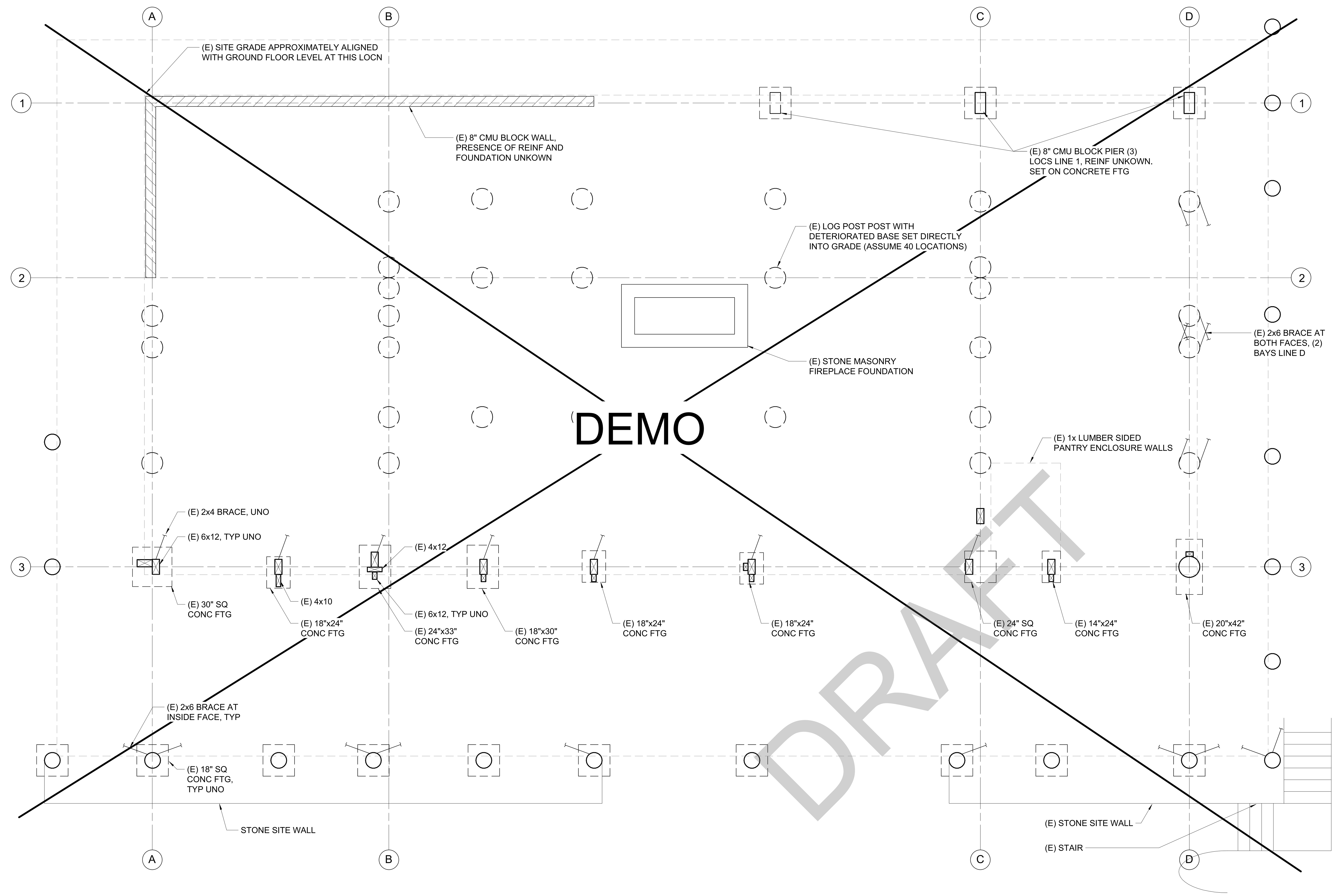
6) Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.

7) The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.

8) Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

9) Due to the relatively small size of the structure, the District may consider dismantling and relocating the structure as an alternative to demolition.

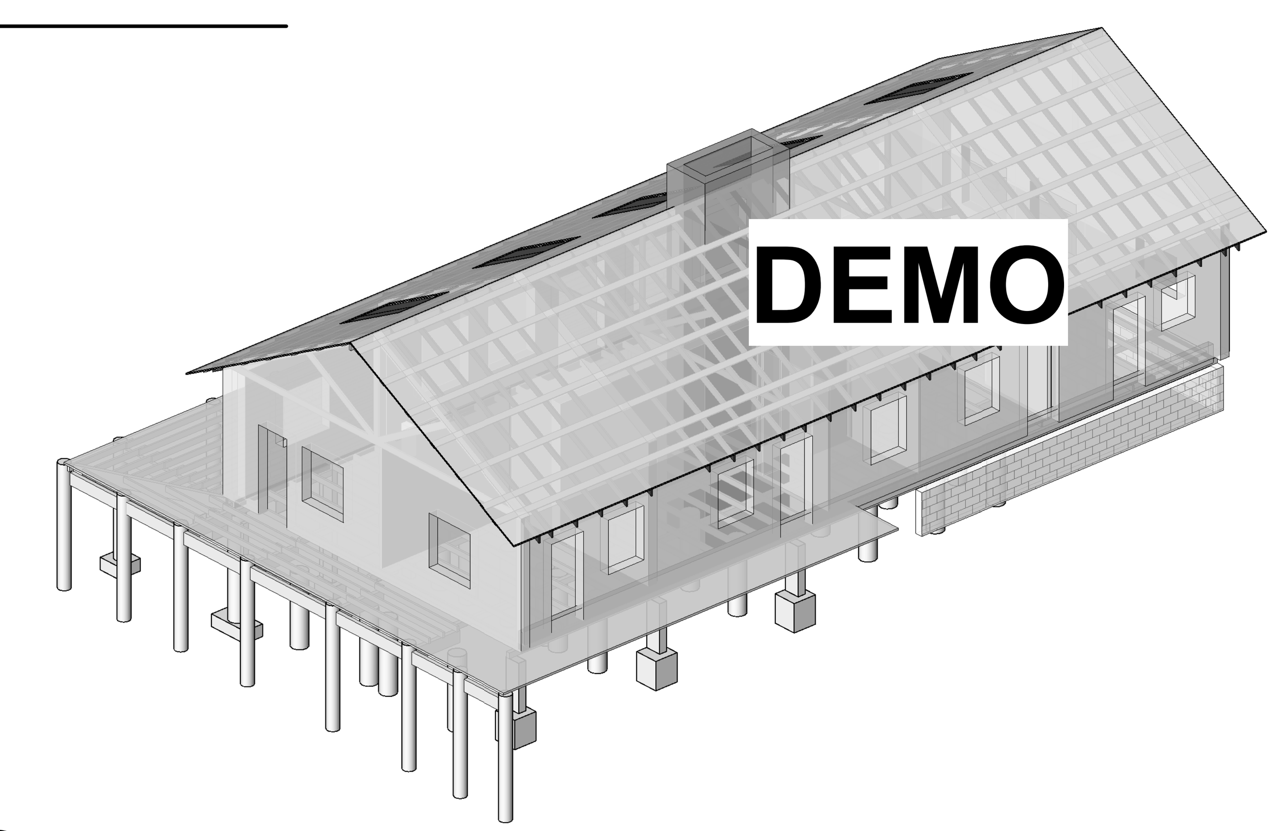
10) Nesting bird surveys are required if work takes place between February 15 and August 30.



NORTH

EXISTING FOUNDATION PLAN BOD OPTION 4

1/4" = 1'-0"



2 3D ISOMETRIC VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Redwood Log Cabin_S19C_leos@zfa.com.rvt

11/22/2019 1:46:57 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 1

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

REDWOOD LOG CABIN
BOD OPTION 4
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

SHEET DESCRIPTION

FOUNDATION PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

4-S2.1

APPENDIX C – SUMMARY DATA SHEET

Summary Data Sheet

BUILDING DATA

Building Name:	Redwood Log Cabin	Date:	10/3/19
Building Address:	La Honda Redwood Preserve Open Space		
Latitude:	37.38744	Longitude:	-122.27814
By:			

Year Built:	1920's	Year(s) Remodeled:	N/A	Original Design Code:	None
Area (sf):	1,940	Length (ft):	66	Width (ft):	30
No. of Stories:	1	Story Height (ft):	9	Total Height (ft):	25

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☑ Residential ☐ Educational ☐ Other:

CONSTRUCTION DATA

Gravity Load Structural System:	Wood sheathing, joists, girders. Steel columns		
Exterior Transverse Walls:	Log walls	Openings?	Yes
Exterior Longitudinal Walls:	Log walls	Openings?	Yes
Roof Materials/Framing:	See gravity load system.		
Intermediate Floors/Framing:	N/A		
Ground Floor:	Log Pole foundations set in grade, select columns replaced with sawn lumber and shallow spread footings		
Columns:	12-18" Logs or 4x and 6x sawn lumber	Foundation:	Shallow concrete
General Condition of Structure:	Poor		
Levels Below Grade?	none		
Special Features and Comments:			

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	Log walls + Timber braces at crawl space	Log walls + Timber braces at crawl space
Vertical Elements:	Log walls + Log Poles at crawl space	Log walls + Log Poles at crawl space
Diaphragms:	1x horizontal lumber sheathing	1x horizontal lumber sheathing
Connections:	Steel fasteners and hardware (few observed)	Steel fasteners and hardware (few observed)

EVALUATION DATA

BSE-1N Spectral Response Accelerations:	S_{DS}= 1.931		S_{D1}= 0.837	
Soil Factors:	Class= C		F_a= 1.0	F_v= 1.3
BSE-1E Spectral Response Accelerations:	S_{XS}= 1.026		S_{X1}= 0.468	
Level of Seismicity:	BSE-1E	Performance Level:	5-D	
Building Period:	T= 0.224			
Spectral Acceleration:	S_a= 1.026g			
Modification Factor:	$C_mC_1C_2$= 1.300	Building Weight: W=	118 kips	
Pseudo Lateral Force:	$V=C_mC_1C_2S_aW$= 157.4 kips			

BUILDING CLASSIFICATION:	**W2 – Wood Frames Commercial and Industrial**	
REQUIRED TIER 1 CHECKLISTS	Yes	No
Basic Configuration Checklist	☑	☐
Building Type W2 Structural Checklist	☑	☐
Nonstructural Component Checklist	☐	☑
FURTHER EVALUATION REQUIREMENT:	**Tier 2 analysis on (11) structural deficiencies**	

Material Properties

To account for uncertainty in the as-built data, a knowledge factor, κ, is determined according to ASCE 41 Table 6-1. Where material properties are not listed in existing construction documents, a knowledge factor of κ=0.75 shall be applied to the component capacities for deformation-controlled and force-controlled actions.

			Default Value per ASCE 41, 4.2.3?	*Alternate Value Source?*
Concrete			Table (4-2)	
Foundation Footings:	f'_c=	2,000 psi	☑	
Slabs:	f'_c=	2,000 psi	☑	
Reinforcing Steel			Table (4-3)	
#3 Bars:	f_y=	40,000 psi	☑	
#4 Bars and Larger:	f_y=	40,000 psi	☑	
Carpentry				
Wall studs and light Framing Members		Site Harvested second growth Redwood		
Sheathing – Horizontal 1x lumber				
Sawn Lumber Posts, Timbers, beams and Stringers	Construction Grade			

APPENDIX D – TIER 1 CHECKLISTS AND STRUCTURAL CALCULATIONS

TIER 1 CHECKLISTS

Table 17-1. Very Low Seismicity Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Structural Components

☐ C	☑ NC	☐ N/A	☐ U	*LOAD PATH: The structure contains a complete, well-defined load path,including structural elements and connections, that serves to transfer theinertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
☐ C	☐ NC	☑ N/A	☐ U	*WALL ANCHORAGE: Exterior concrete or masonry walls that are dependenton the diaphragm for lateral support are anchored for out-of-plane forcesat each diaphragm level with steel anchors, reinforcing dowels, or straps thatare developed into the diaphragm. Connections have adequate strength toresist the connection force calculated in the Quick Check procedure ofSection 4.4.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)*

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low Seismicity

Building System—General

☐ C ☑ NC ☐ N/A ☐ U	*LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
☐ C ☐ NC ☑ N/A ☐ U	*ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25%of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)*
☐ C ☐ NC ☑ N/A ☐ U	*MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of themain structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)*

Building System—Building Configuration

☐ C ☑ NC ☐ N/A ☐ U	*WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)*
	Inadequate number of bays of braced frames are provided. Due lack of redundancy, further evaluation of the braced frames is required to ensure structural adequacy.
☐ C ☑ NC ☐ N/A ☐ U	*SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)*
☐ C ☑ NC ☐ N/A ☐ U	*VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)*
☐ C ☑ NC ☐ N/A ☐ U	*GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)*
☑ C ☐ NC ☐ N/A ☐ U	*MASS:There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)*
☐ C ☑ NC ☐ N/A ☐ U	*TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)*

Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)

Geologic Site Hazards

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

☐ C ☐ NC ☑ N/A ☐ U	*LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)*
☐ C ☐ NC ☑ N/A ☐ U	*SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)*
☐ C ☐ NC ☑ N/A ☐ U	*SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)*

High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)

Foundation Configuration

☐ C ☐ NC ☑ N/A ☐ U	*OVERTURNING:The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)*
☐ C ☐ NC ☑ N/A ☐ U	*TIES BETWEEN FOUNDATION ELEMENTS:The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)*

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a
Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low and Moderate Seismicity
Seismic-Force-Resisting System

☐ C ☑ NC ☐ N/A ☐ U	*REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)*
	Non Compliant below the ground floor
☐ C ☑ NC ☐ N/A ☐ U	*SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):* *Structural panel sheathing 1,000 lb/ft* *Diagonal sheathing 700 lb/ft* *Straight sheathing 100 lb/ft* *All other conditions 100 lb/ft*
	By observation no shear walls at crawl space
☐ C ☐ NC ☑ N/A ☐ U	*STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☑ NC ☐ N/A ☐ U	*WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)*
	No positive connection of walls thru floor level are evident
☐ C ☑ NC ☐ N/A ☐ U	*HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)*
	No shear walls present
☐ C ☑ NC ☐ N/A ☐ U	*CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)*
	No shear walls present
☐ C ☐ NC ☑ N/A ☐ U	*OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)*

Connections

☐ C ☑ NC ☐ N/A ☐ U	*WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)*
	None present by obsevation

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

☐ C ☑ NC ☐ N/A ☐ U	*WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)*
	None present by obsevation
☐ C ☑ NC ☐ N/A ☐ U	*GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)*
	None present by obsevation

High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)

Connections

☐ C ☑ NC ☐ N/A ☐ U	*WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)*
	None present by obsevation

Diaphragms

☐ C ☐ NC ☑ N/A ☐ U	*DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)*
☑ C ☐ NC ☐ N/A ☐ U	*ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)*
☑ C ☐ NC ☐ N/A ☐ U	*STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)*
☐ C ☑ NC ☐ N/A ☐ U	*SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)*
	Only Horiz. Lumber sheathing is present, no diagonal lumber or structural panels used in existing diaphragm construction.
☐ C ☐ NC ☑ N/A ☐ U	*DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)*
☐ C ☐ NC ☑ N/A ☐ U	*OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)*

SEISMIC HAZARD ANALYSIS

ASCE 41-17 §2.4

Site Coordinates

Latitude =	37.3874	deg	Redwood Cabin Condition Assessment
Longitude =	-122.2781	deg	San Mateo County, California

Spectral Response Acceleration Parameters

ASCE 41-17 §2.4.1.4

Site Class =	**C**		Site Soil Classification
S_S =	0.855	g	Mapped Short-period Spectral Response Acceleration
S_1 =	0.312	g	Mapped 1-sec period Spectral Response Acceleration
S_{XS} =	1.026	g	Short-period Spectral Response Acceleration at BSE-1E
S_{X1} =	0.468	g	1-sec period Spectral Response Acceleration at BSE-1E

SEISMIC FORCE

ASCE 41-17 §4.5.2

Building Properties

Type N/S =	W1		Building Type in North-South Direction	*ASCE 41-17 Table 3-1*
Type E/W =	W1		Building Type in East-West Direction	*ASCE 41-17 Table 3-1*
Height, h_n =	25.00	ft	Height above base to roof level	
Stories =	1		Number of stories	
Weight N/S =	118.0	k	Seismic Weight of Building in North-South Direction	
Weight E/W =	118.0	k	Seismic Weight of Building in East-West Direction	

Building Period

ASCE 41-17 §4.5.2.4

North-South Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.224	sec	Fundamental Period	$=C_t{*}h_n^{\beta}$

East-West Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.224	sec	Fundamental Period	$=C_t{*}h_n^{\beta}$

Pseudo-Seismic Force

ASCE 41-17 §4.5.2.1

North-South Direction:

S_a =	1.03	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.33	*W	Pseudo-Seismic Force in Terms of Weight	*=C*Sa*W*
V =	**157.4**	k	Pseudo-Seismic Force	

East-West Direction:

S_a =	1.03	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.33	*W	Pseudo-Seismic Force in Terms of Weight	*=C*Sa*W*
V =	**157.4**	k	Pseudo-Seismic Force	

EXHIBIT C

Geotechnical Investigation

by Romig Engineers

Attachment 1

ROMIG ENGINEERS

GEOTECHNICAL INVESTIGATION

REDWOOD CABIN STRUCTURAL STABILIZATION
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
LA HONDA CREEK PRESERVE
SAN MATEO COUNTY, CALIFORNIA

Prepared for
ZFA Structural Engineers
1390 El Camino Real, Suite 100
San Carlos, California 94070

October 2019
Project No. 4907-1

ROMIG ENGINEERS

October 2, 2019
4907-1

ZFA Structural Engineers
1390 El Camino Real, Suite 100
San Carlos, California 94070

**RE: GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION
REDWOOD CABIN
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
LA HONDA CREEK PRESERVE
SAN MATEO COUNTY, CALIFORNIA**

Attention: Mr. Steve Patton, P.E.

Gentlemen:

In accordance with your request, we have performed a geotechnical investigation for the structural stabilization of the Redwood Cabin located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The accompanying report summarizes the results of our subsurface exploration, laboratory testing, and engineering analysis, and presents our geotechnical recommendations for the proposed project.

We refer you to the text of our report for specific recommendations.

Thank you for the opportunity to work with you on this project. Please call if you have questions or comments about site conditions or the findings and recommendations from our site investigation.

Very truly yours,

ROMIG ENGINEERS, INC.

REGISTERED PROFESSIONAL ENGINEER
LUCAS J. OTTOBONI
No. 84234
CIVIL
STATE OF CALIFORNIA

Lucas J. Ottoboni, P.E.

REGISTERED PROFESSIONAL ENGINEER
GLENN A. ROMIG
002157
GEOTECHNICAL
STATE OF CALIFORNIA

Glenn A. Romig, P.E., G.E.

Copies: Addressee (1+via email)
Midpeninsula Regional Open Space District (3+via email)
Attn: Ms. Tanisha Werner

GAR:LO:dr

Attachment 1

GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION – REDWOOD CABIN
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
LA HONDA CREEK PRESERVE
SAN MATEO COUNTY, CALIFORNIA

PREPARED FOR:
ZFA STRUCTURAL ENGINEERS
1390 EL CAMINO REAL, SUITE 100
SAN CARLOS, CALIFORNIA 94070

PREPARED BY:
ROMIG ENGINEERS, INC.
1390 EL CAMINO REAL, SECOND FLOOR
SAN CARLOS, CALIFORNIA 94070

OCTOBER 2019

ROMIG ENGINEERS

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

GEOTECHNICAL INVESTIGATION
FOR
STRUCTURAL STABILIZATION – REDWOOD CABIN
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
LA HONDA CREEK PRESERVE
SAN MATEO COUNTY, CALIFORNIA

INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed structural stabilization of the Redwood Cabin located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The location of the site is shown on the Vicinity Map, Figure 1. The purpose of this investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for the proposed improvements.

Project Description

The project consists of improving or abandoning the Redwood Cabin structure in the Midpeninsula Regional Open Space District La Honda Creek Preserve. Since the options to abandon the structure will not require engineering solutions, those options have not been addressed in our report. If improved, the existing structure will either be stabilized to allow for exterior viewing only or the existing structure will be retrofitted to become habitable space.

Scope of Work

The scope of our work for this investigation was presented in our agreement with ZFA Structural Engineers, dated June 25, 2019. In order to accomplish our investigation, we performed the following work.

- Review of geologic, geotechnical, and seismic conditions in the vicinity of the site. In addition, our Field Geologist and Senior Project Engineer performed a geologic reconnaissance in the immediate vicinity of the cabin.
- Subsurface exploration consisting of drilling, sampling, and logging of three exploratory borings.
- Laboratory testing of selected samples to aid in material classification and to help evaluate the engineering properties of the soil and bedrock encountered at the site.

- Engineering analysis and evaluation of the subsurface data to develop geotechnical design criteria.
- Preparation of this report presenting our findings and geotechnical recommendations for the proposed improvements.

Limitations

This report has been prepared for the exclusive use of ZFA Structural Engineers for specific application to developing geotechnical design criteria for the proposed structural stabilization of the Redwood Cabin located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. We make no warranty, expressed or implied, for the services performed for this project. Our services have been performed in accordance with the geotechnical engineering principles generally accepted at this time and location. This report was prepared to provide engineering opinions and recommendations only. In the event there are any changes in the nature, design or location of the project, or if any future improvements are planned, the conclusions and recommendations contained in this report should not be considered valid unless 1) the project changes are reviewed by us, and 2) the conclusions and recommendations presented in this report are modified or verified in writing.

The analysis, conclusions, and recommendations presented in this report are based on site conditions as they existed at the time of our investigation; the currently planned improvements; review of readily available reports relevant to the site conditions; and laboratory test results. In addition, it should be recognized that certain limitations are inherent in the evaluation of subsurface conditions, and that certain conditions may not be detected during an investigation of this type. Changes in the information or data gained from any of these sources could result in changes in our conclusions or recommendations. If such changes occur, we should be advised so that we can review our report in light of those changes.

SITE EXPLORATION AND RECONNAISSANCE

Site reconnaissance and subsurface exploration were performed on August 8, 2019. Subsurface exploration was performed using portable Minuteman drilling and sampling equipment. Three exploratory borings were advanced to depths of 8.8 to 16 feet. The approximate locations of the borings are shown on the Site Plan, Figure 2. The boring logs and the results of our laboratory tests are attached in Appendices A and B, respectively.

Surface Conditions

The site is located in a rural and heavily wooded area south of Skyline Boulevard within the La Honda Creek Preserve in an area we understand was utilized as a redwood logging site. The site was accessed by dirt roads through the preserve. At the time of our exploration and reconnaissance, the site was occupied by a single-story wood-log cabin with a wraparound wood deck. Native shrubs and tall redwood trees surrounded the cabin.

The cabin was located on moderately to gently sloping ground which generally sloped down to the east, northeast and north at declinations of about 3:1 to 5:1 (horizontal:vertical). Due to the sloping ground conditions around and beneath the structure, the crawlspace ranged from about 1 foot high at the southwest corner to about 10 feet high at the northeast and east. During our site walk on February 7, 2019, it was raining and we noted water running within the crawlspace of the cabin as well as saturated ground conditions around the structure.

The cabin appeared to be supported on a redwood logs extending directly down from the structure (tall enough to accommodate the crawlspace heights) and in contact with the ground. The deck appeared to be supported on concrete pad footings. The depth and dimensions of the foundations are unknown and we note that the diameter of the logs varied slightly from about 12 inches to 18 inches. The wood deck around the perimeter appeared to be in poor condition with portions of the deck collapsed.

Depending on the construction methods used, it is possible but not known if the log foundations are embedded directly into the earth, or set in a larger diameter hole filled with concrete or sand. This may impact the design and/or methods of retrofit foundations.

Subsurface Conditions

At the location of Boring EB-1, which was advanced at the southwest corner of the cabin, we encountered about 4 feet of colluvium composed of very stiff to hard sandy lean clay of low to moderate plasticity. Beneath the colluvium, we encountered hard residual soil composed of sandy lean clay of low plasticity underlain by clayey sandstone bedrock of the Butano Formation.

At Borings EB-2 and EB-3, advanced northwest and east of the cabin, respectively, we encountered about 2 feet of very stiff sandy lean clay of low plasticity underlain by clayey sandstone bedrock of the Butano Formation.

A Liquid Limit of 39 and a Plasticity Index of 18 were measured on a sample of near-surface soil obtained from Boring EB-1. These test results indicate the surface and near-surface soils we encountered at the site have low to moderate plasticity and a low to moderate potential for expansion.

Three free-swell tests performed on samples of bedrock obtained in our borings indicated free swell values ranging from 20 to 60 percent. These free-swell test results along with our experience suggest the bedrock tested has a low potential for expansion.

Ground Water

Ground water was not encountered during our investigation. The borings were backfilled with grout after drilling and sampling was completed. Please be cautioned that fluctuations in the level of ground water can occur due to variations in rainfall, landscaping, underground drainage patterns, and other factors. It is also possible and perhaps even likely that a perched ground water table could develop seasonally in the soil and upper portion of the bedrock during and after significant rainfall at the upslope areas, or possibly during wet years, or a series of wet years.

GEOLOGIC SETTING

We have briefly reviewed our local experience and the geologic literature pertinent to the general site area. The information reviewed indicates that the site is located in an area mapped as middle and lower Eocene aged Butano Sandstone, Tb (Brabb, Graymer and Jones, 2000). This unit is expected to consist of light gray to buff, very fine to very coarse grained arkosic sandstone in thin to very thick beds interbedded with dark gray to brown mudstone and shale. The geology of the site vicinity is shown on the Vicinity Geologic Map, Figure 3.

The preliminary State Seismic Hazard Zones Map of the Woodside Quadrangle (2018) prepared by the California Geological Survey indicates that the site is located in an area that is potentially susceptible to "Earthquake-Induced Landslides." In addition, the site is located within a Dormant Young landslide as shown on the California Landslide Inventory Database, Figure 5.

The lot and immediate site vicinity are located in a moderately to very steeply sloping hillside, and the site is located at an elevation of approximately 1,600 feet above sea level, Figure 1.

Slope Reconnaissance

We performed a brief reconnaissance of the immediate cabin area and a larger area surrounding the site.

Although the cabin is located in an area of moderately to gently sloping terrain, as discussed previously, we observed two massive and very steep slopes, estimated to be 1:1 (horizontal:vertical) to near vertical located about 300 to 500 feet southwest and southeast of the cabin. At the base of the massive southwest slope there was a transition to a gently sloping basin which led into the area upslope/near Boring EB-1. Although no headscarp was visible, the transition of the very steep slope to gently sloping hummocky basin and the presence of colluvium in Boring EB-1 indicated previous movement of material in the downslope direction. Similarly, an abrupt transition from a very steep slope to a relatively flat basin area was observed at the base of the southwest slope.

Along the upslope side of the dirt roads and wider trails which provided access to and around the cabin, we observed sandstone rock outcrops. Along a portion of the road/trail northwest of the cabin we observed a shallow failure with a scarp that exposed bedrock up to about 4 feet high.

La Honda Creek was located downslope to the north of the cabin which included very steep banks with shallow failures observed (from the top) in areas. We did not walk down to the base of or along the creek during our visit.

The features indicated above are not included in the area of the topographic boundary survey and therefore were not included on Figure 2.

Based on our review of maps and our site reconnaissance, periodic slope movement appears to have occurred in the natural terrain which is primarily comprised of natural drainage ways, massive and steep slopes, and a lower creek. However, we note that we did not observe landslides in the immediate area (within about 50 feet) of the cabin.

Faulting and Seismicity

There are no mapped through-going faults within or adjacent to the site and the site is not located within a State of California Earthquake Fault Zone (formerly known as a Special Studies Zone), an area where the potential for fault rupture is considered probable. The closest active fault is the San Andreas fault, which is located approximately 2.1 miles northeast of the property. Thus, the likelihood of surface rupture occurring from active faulting at the site is low.

The San Francisco Bay Area is an active seismic region. Earthquakes in the region result from strain energy constantly accumulating because of the northwestward movement of the Pacific Plate relative to the North American Plate. On average about 1.6-inches of movement occur per year. Historically, the Bay Area has experienced large, destructive earthquakes in 1838, 1868, 1906, and 1989. The faults considered most likely to produce large earthquakes in the area include the San Andreas, San Gregorio, Hayward, and Calaveras faults. The San Gregorio fault is located approximately 8.3 miles southwest of the site. The Hayward and Calaveras faults are located approximately 21 and 26 miles northeast of the site, respectively. These faults and significant earthquakes that have been documented in the Bay Area are listed in Table 1, and are shown on the Regional Fault and Seismicity Map, Figure 4.

Table 1. Earthquake Magnitudes and Historical Earthquakes
Structural Stabilization
San Mateo County, California

Fault	Maximum Magnitude (Mw)	Historical Earthquakes	Estimated Magnitude
San Andreas	7.9	1989 Loma Prieta	6.9
		1906 San Francisco	7.9
		1865 N. of 1989 Loma Prieta Earthquake	6.5
		1838 San Francisco-Peninsula Segment	6.8
		1836 East of Monterey	6.5
Hayward	7.1	1868 Hayward	6.8
		1858 Hayward	6.8
Calaveras	6.8	1984 Morgan Hill	6.2
		1911 Morgan Hill	6.2
		1897 Gilroy	6.3
San Gregorio	7.3	1926 Monterey Bay	6.1

In the future, the subject property will undoubtedly experience severe ground shaking during moderate and large magnitude earthquakes produced along the San Andreas fault or other active Bay Area fault zones. Using information from recent earthquakes, improved mapping of active faults, ground motion prediction modeling, and a new model for estimating earthquake probabilities, a panel of experts convened by the U.S.G.S. have concluded there is a 72 percent chance for at least one earthquake of Magnitude 6.7 or larger in the Bay Area before 2043. The Hayward fault has the highest likelihood of an earthquake greater than or equal to magnitude 6.7 in the Bay Area, estimated at 33 percent, while the likelihood on the San Andreas and Calaveras faults is estimated at approximately 22 and 26 percent, respectively (Aagaard et al., 2016).

Earthquake Design Parameters

The State of California currently requires that buildings and structures be designed in accordance with the seismic design provisions presented in the 2016 California Building Code and in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures." Based on site geologic conditions and on information from our subsurface exploration at the site, the site may be classified as Site Class C, very dense soil and soft rock, in accordance with Chapter 20 of ASCE 7-10. Spectral Response Acceleration parameters and site coefficients may be taken directly from the U.S.G.S. website based on the longitude and latitude of the site. For site latitude (37.3874), longitude (-122.2779) and Site Class C, design parameters are presented on Table 2.

Table 2. 2016 CBC Seismic Design Criteria
Structural Stabilization
San Mateo County, California

Spectral Response Acceleration Parameters		Design Value
Mapped Value for Short Period -	S_S	2.249
Mapped Value for 1-sec Period -	S_1	1.031
Site Coefficient -	F_a	1.0
Site Coefficient -	F_v	1.3
Adjusted for Site Class -	S_{MS}	2.249
Adjusted for Site Class -	S_{M1}	1.341
Value for Design Earthquake -	S_{DS}	1.499
Value for Design Earthquake -	S_{D1}	0.894

CONCLUSIONS

From a geotechnical viewpoint, the site is suitable for the proposed structural stabilization of the redwood cabin structure provided the recommendations presented in this report are followed during design and construction. Specific geotechnical recommendations for the project are presented in the following sections of this report.

The primary geotechnical concerns at the site are:

- The varying depth to competent material ranging from 2 feet to 4 feet anticipated across the structure;
- The unknown depth of embedment and construction materials used to embed the redwood posts/foundations;

- The remote location and limited access within the crawlspace for construction of uplift resisting elements;
- The history of landsliding observed and mapped upslope of the site;
- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area.

Foundations

In our opinion, for both a stabilization option which would include exterior viewing only or if the cabin is fully retrofitted and will be used as habitable space, the posts may be supported on spread footing foundation pads extending into stiff residual soil or bedrock below any colluvial soils. We expect that the south and southwest portions of the footprint near Boring EB-1 may require excavations up to about 4 to 5 feet to accomplish this. This is discussed in further detail on the following page.

Unknown Existing Conditions Affecting the Design

It is possible that the existing posts are either embedded directly into the earth or alternatively, embedded in a larger diameter hole and filled with sand, cement, or another type of material. Depending on the depth of the existing posts, the new foundation excavations may not extend below the bottom of the embedded posts. If this condition is encountered, the new foundation pads should be designed and constructed to include a bearing surface that extends out at least 12 inches wide from outside edge of the embedded post or outside edge of the larger filled hole, if encountered. As an alternative, the remaining length of the post could be removed along with any other material and the resulting void could be properly benched and backfilled as recommended.

Limited Access Uplift Resisting Elements

Due to the remote location and limited access within the crawlspace, we have provided recommendations for uplift resisting elements that may be constructed in settings with tight access such as this: hand-dug shafts and micropiles.

Slope Stability

As discussed above, the terrain in the near vicinity of the cabin is primarily comprised of natural drainage ways, massive and steep slopes, and a lower creek. As a result, it is possible for slope movement to continue to occur as it has in the past. However, we note that we did not observe any recent landslides in the area immediately surrounding the cabin, and in our opinion, the immediate slopes and building area of the cabin appear relatively stable.

Because subsurface conditions may vary from those encountered at the locations of our exploratory borings, and to confirm that our recommendations are properly implemented, we recommend that we be retained to: 1) review the grading and foundation plans for conformance with our recommendations; and 2) observe and test during all phases of earthwork, foundation, and slab construction.

FOUNDATIONS

Deepened Spread Footings

In our opinion, the existing posts may be supported on conventional spread footings bearing in stiff residual soil and/or bedrock beneath colluvial soils. The foundations should have a width of at least 15 inches and should extend at least 30 inches below lowest exterior grade. At the perimeter, exterior finished grade should be considered the lowest adjacent grade within 5 feet of downslope side of any footing excavations.

Footings should also extend at least 6 inches into competent residual soil or bedrock, even if this requires deeper embedment than stated above. As mentioned in the above sections, up to about 4 feet of colluvial soils were encountered in Boring EB-1. If this requires footings to be excavated to a depth of about 4 to 5 feet, lean concrete or compacted fill may be placed at the deepened portion of the footing excavations. If compacted fill is used, we recommend that aggregate base rock or other granular soil be used and be compacted and tested per the earthwork guidelines of this report.

In addition, footings should be designed and constructed to include a bearing surface extends out at least 12 inches wide from outside edge of the embedded post or outside edge of larger filled hole, where encountered. As an alternative, if the remaining length of the post along with any other material will be removed and the resulting void benched and backfilled, this requirement need not apply.

Foundations with at least these minimum dimensions may be designed for an allowable bearing pressure of 3,000 pounds per square foot for dead plus live loads with a one-third increase allowed when considering additional short-term wind or seismic loading. If the posts are assumed to stay in place, the bearing capacity should be reduced by subtracting out a bearing surface in the middle of the footing equivalent to a circular post with a 16-inch diameter; depending on field conditions observed, the neglected diameter may need to be increased if sand or soil was used to backfill around the posts.

All footings located adjacent to utility lines should be embedded below a 1:1 plane extending up from the bottom edge of the utility trench. We recommend that continuous foundations be reinforced with sufficient top and bottom steel to provide structural continuity and to permit spanning of local irregularities.

The bottom of all footing excavations should be cleaned of loose and soft soil and debris. A member of our staff should observe the excavations to confirm that they have at least the minimum recommended dimensions, are founded in competent residual soil or bedrock, and have been properly cleaned prior to placing concrete forms and reinforcing steel. If existing fill soil, colluvial soil, or disturbed bedrock is encountered at the foundation bearing depth, our field representative will require these materials to be removed and a deeper embedment depth before reinforcing steel is placed.

Unknown Existing Conditions

Since records documenting the construction of the existing foundations are not available, and the actual depth and width of the foundations are unknown, there is uncertainty regarding the design and construction of the new foundations. As discussed above, if the new foundation excavations do not extend below the bottom of the embedded posts, there are two design alternatives: to cut the existing post and the bottom of the new foundation excavation and leave the post in place (recommendations presented above) or to remove the post and properly bench and backfill the resulting void prior to construction of the new foundation.

If the post will be removed, the resulting excavations should be backfilled with on-site soil, lean concrete, imported granular non-expansive fill, or Class 2 aggregate base placed in lifts no thicker than 8 inches and compacted as recommended in the section titled "Compaction." Proposed backfill materials should be approved by a member of our staff prior to delivery to the site. The backfill material should be moisture conditioned, and compacted as recommended in the section of this report titled "Compaction."

Depending on the depth of the posts, the near-vertical excavation sidewalls should be cut (benched) at a projected plane approximating a 1:1 (horizontal:vertical) to the surface. Benching should begin about 2 to 3 feet above the bottom of the excavation. A member of our staff should observe and test during benching, backfilling and compaction of the basement.

During construction when the existing foundations are exposed, the design and construction team should observe their condition and establish if any remedial measures or supplemental recommendations are appropriate.

Lateral Loads for Spread Footing Foundations

Lateral loads will be resisted by friction between the bottom of the spread footings/piers and the supporting subgrade. A coefficient of friction of 0.30 may be assumed for design. Lateral resistance may also be provided by passive soil pressure acting against foundations cast neat in footing excavations or backfilled with properly compacted structural fill. We recommend a passive pressure based on an equivalent fluid pressure of 350 pounds per cubic foot be used in design. The upper foot of passive soil resistance should be neglected where soil adjacent to the footing is not covered with a slab or pavement.

Settlement for Spread Footing Foundations

Thirty-year post-construction differential settlement due to static loads is not expected to exceed about 1 inch across the areas supported on new foundations, provided the foundations are designed and constructed as recommended.

UPLIFT RESISTING ELEMENTS

We understand that the stabilization/retrofit of the cabin may require some hold down elements to resist uplift forces. If the weight of the shallow foundations recommended above will not meet the uplift capacity requirements, we have provided two additional limited access alternatives.

Hand-Excavated Piers

The spread footing foundations recommended above may be extended deeper to become hand-excavated piers/shafts. These piers may be designed for end bearing resistance using an allowable bearing pressure of 3,500 pounds per square foot for dead plus live loads, with a one-third increase allowed for total loads including wind or seismic forces. Hand excavated piers should have a center to center spacing of at least three pier diameters.

Piers may be designed for an allowable skin friction of 400 pounds per square foot for dead plus live loads, with a one-third increase allowed for total loads including wind or seismic forces. An allowable uplift skin friction of 320 pounds per square foot may be used. Vertical support provided by soil against the upper 1 foot of the piers should be neglected in design. Piers should have a center-to-center spacing of at least three pier diameters.

Depending on the depth of the piers required, it is possible that cribbing or support elements will be utilized during construction. Since the cribbing or support elements will likely remain in place, there will be a reduction in the skin friction of the hand-excavated piers/shafts.

On a preliminary basis, the area providing skin friction resistance should be reduced by one half of the perimeter shaft area (assuming cribbing will be installed over one half of the excavation). During construction when the existing foundations are exposed, the design and construction team should observe their condition and establish if any remedial measures or supplemental recommendations are appropriate.

Micropiles

Micropiles are a relatively small diameter drilled anchor with steel reinforcing bar(s) that can be fixed to the new foundation. The piles can be installed with little vibration effects on adjacent structures and are believed to be economical alternative to a drilled piers that can also be constructed in tight-access settings.

The load capacity of micropiles piles, while typically large, is dependent upon the specific pile type and installation method of the contractor, and is usually based in part on load tests of selected piles.

In our opinion, the micropiles should have a minimum diameter of at-least 6 inches. We anticipate that relatively high skin friction values are likely to be developed for the micropiles. On a preliminary basis, the micropiles may be designed for an allowable skin friction of 1,000 pounds per square foot. This skin friction (with a factor of safety of at least 1.5) should be confirmed in the field during the initial stages of construction with proof load testing. The proof testing should be conducted on the portion of the micropile that is designed as bonded; the unbonded portion should remain ungrouted during the initial proof load testing. If the ultimate strength of the micropile steel limits the magnitude of the test load, a shorter grouted section should be used to confirm the preliminary bond strength recommended above. The bonded length will depend on micropile spacing and desired capacity.

The actual skin friction and pull-out capacity of the micropiles is dependent upon the installation method and the extent of secondary grouting and should be confirmed in the field during construction with performance and proof load testing; our representative should approve the testing to verify that the needed capacities are obtained. Therefore, it may be feasible for the designer if, due to their local experience, they wish to design for a higher skin friction/bond strength.

The drilling, installation method, and testing of all micropiles should be observed in the field by our representative to verify that the appropriate micropile unbonded length, bonded length, clean condition of the drill hole, and the capacities are obtained.

Lateral Loads for Hand-Dug Shafts and Micropiles

Lateral loads on the hand-dug shafts or micropiles may be resisted by passive earth pressure based upon an equivalent fluid pressure of 350 pounds per cubic foot, acting on 2 times the projected area of the pier. The passive resistance of the upper 2 feet of the piers should be neglected in design where soil adjacent to the footing is not covered and protected by a concrete slab or pavement.

Settlement for Hand-Dug Shafts and Micropiles

Thirty-year post-construction differential settlement due to static loads is not expected to exceed about ½-inch across the improvements supported on either hand-dug shafts or micropiles, provided the foundations are designed and constructed as recommended.

SLABS-ON-GRADE

General Slab Considerations

To reduce the potential for movement of the slab subgrade, at least the upper 6 inches of subgrade soil should be scarified and compacted at a moisture content near the laboratory optimum. The native soil subgrade should be kept moist up until the time the non-expansive fill, crushed rock and vapor barrier, and/or aggregate base is placed. Slab subgrades and non-expansive fill should be prepared and compacted as recommended in the section of this report titled "Earthwork."

Overly soft or moist soils should be removed from slab-on-grade areas. Exterior flatwork and interior slabs-on-grade should be underlain by a layer of non-expansive fill as discussed below. The non-expansive fill should consist of aggregate base rock or a clayey soil with a plasticity index of 15 or less.

Considering the potential for some differential movement of the surface and near-surface soils, we expect that reinforced slabs will perform better than unreinforced slabs. Consideration should be given to using a control joint spacing on the order of 2 feet in each direction for each inch of slab thickness.

<u>**Exterior Flatwork**</u>

Concrete walkways and exterior flatwork should be at least 4 inches thick and should be constructed on at least 6 inches of Class 2 aggregate base. To improve performance, exterior slabs-on-grade, such as for patios, may be constructed with a thickened edge to improve edge stiffness and to reduce the potential for water seepage under the edge of the slabs and into the underlying base and subgrade. In our opinion, the thickened edges should be at least 8 inches wide and ideally should extend at least 4 inches below the bottom of the underlying aggregate base layer.

EARTHWORK

<u>**Clearing and Subgrade Preparation**</u>

All deleterious materials, such as designated existing foundations and retaining walls, slabs and utilities to be abandoned, surface fills, concrete, vegetation, roots, topsoil, etc., should be cleared from areas to be built on or paved. The actual stripping depth should be determined by a member of our staff at the time of construction. Excavations that extend below finish grade should be backfilled with structural fill that is water-conditioned, placed, and compacted as recommended in the section titled "Compaction."

After the site has been properly cleared, stripped, and excavated to the required grades, exposed soil surfaces in areas to receive structural fill or slabs-on-grade should be scarified to a depth of 6 inches, moisture conditioned, and compacted as recommended for structural fill in the section titled "Compaction."

Large fills are generally not desirable on a hillside site like this. However, if fills are to be constructed on natural slopes having an inclination steeper than 6 horizontal to 1 vertical, the fill should be benched, and a key excavated into the underlying bedrock, and subdrains installed if required by our field representative. If significant fills are required, we can evaluate their feasibility and provide benching criteria as necessary.

<u>**Material for Fill**</u>

All on-site soil containing less than 3 percent organic material by weight (ASTM D2974) is suitable for use as structural fill. However, structural fill placed at the site, should not contain rocks or pieces larger than 6 inches in greatest dimension, and contain no more than 15 percent larger than 2.5 inches. Imported fill should have a plasticity index of less than 15 percent or be predominately granular. Our representative should approve import materials prior to their use on-site.

Compaction

Scarified soil surfaces and all structural fill should be placed and compacted in uniform lifts no thicker than 8 inches in pre-compacted thickness, conditioned to the appropriate moisture content, and compacted as recommended for structural fill in Table 3. The relative compaction and moisture content recommended in Table 3 is relative to ASTM Test D1557, latest edition.

Table 3. Compaction Recommendations
Structural Stabilization
San Mateo County, California

General	Relative Compaction*	Moisture Content*
• Scarified subgrade in areas to receive structural fill	90 percent	At least 2 percent above optimum
• Structural fill composed of expansive native soil.	90 percent	At least 2 percent above optimum
• Structural fill composed of non-expansive fill.	90 percent	Above optimum
• Structural fill below a depth of 4 feet.	92 percent	2 percent above optimum
Utility Trench Backfill		
• On-site expansive clay.	90 percent	At least 2 percent above optimum
• Imported sand	95 percent	Near optimum

* Relative to ASTM Test D1557, latest edition.

Temporary Excavation Shoring

Since the existing cabin will be located directly above or adjacent to the foundation underpinning, temporary shoring or bracing to support the cabin will be necessary during construction.

The contractor should be responsible for the design and construction of all temporary slopes and any required shoring. Shoring and bracing should be provided in accordance with all applicable local, state, and federal safety regulations, including the current OSHA excavation and trench safety standards.

Protection of structures and slopes near cuts should also be the responsibility of the contractor. In our experience, a preconstruction survey is generally performed to document existing conditions prior to construction, with intermittent monitoring of the structures during construction. The contractor should be responsible for staging the required cuts and wall construction and the design of temporary cut slopes and/or required shoring and bracing of the existing cabin.

Because of the potential for variation of the on-site soils, field modification of temporary cut slopes may be required. Unstable materials encountered on slopes during and after excavation should be trimmed off even if this requires cutting the slopes back to a flatter inclination.

Finished Slopes

We recommend that finished slopes be cut or filled to an inclination preferably no steeper than 2:1 (horizontal:vertical). Exposed slopes may be subject to minor sloughing and erosion that could require periodic maintenance. We recommend that all slopes and soil surfaces disturbed during construction be planted to with erosion-resistant vegetation.

Surface Drainage

Finished grades should be designed to prevent ponding of water and to direct surface water runoff away from foundations, and edges of slabs and pavements, and toward suitable collection and discharge facilities. Slopes of at least 2 percent are recommended for flatwork and pavement areas with 5 percent preferred in landscape areas within 8 feet of the structures, where possible. Roof downspout water should be collected in a closed pipe system that is routed to a storm drain system or other suitable location.

Drainage facilities should be observed to verify that they are adequate and that no adjustments need to be made, especially during the first two years following construction. We recommend preparing an as-built plan showing the locations of surface and subsurface drain lines and clean-outs. The drainage facilities should be periodically checked to verify that they are continuing to function properly. It is likely the drainage facilities will need to be periodically cleaned of silt/debris that may build up in the lines.

FUTURE SERVICES

Plan Review

Romig Engineers should review the completed grading and foundation plans for conformance with the recommendations presented in this report. We should be provided with these plans as soon as possible upon their completion in order to limit the potential for delays in the permitting process that might otherwise be attributed to our review process. In addition, it should be noted that many of the local building and planning departments now require "clean" geotechnical plan review letters prior to acceptance of plans for their final review. Since our plan reviews often result in recommendations for modification of the plans, our generation of a "clean" review letter often requires two iterations. At a minimum, we recommend the following note be added to the plans.

"Earthwork, slab subgrade and non-expansive fill preparation, foundation construction, installation and testing of micropiles, retaining wall drainage and backfilling, utility trench backfilling, and site drainage should be performed in accordance with the geotechnical report prepared by Romig Engineers, Inc., dated October 2, 2019. Romig Engineers should be notified at least 48 hours in advance of any earthwork or foundation construction and should observe and test during earthwork and foundation construction as recommended in the geotechnical report."

Construction Observation and Testing

Earthwork and foundation construction should be observed and tested by us to: 1) confirm that subsurface conditions are compatible with those used in the analysis and design; 2) observe compliance with the design concepts, specifications, and recommendations, and; 3) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations presented in this report are based on one boring. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it will be necessary to reevaluate our recommendations.

❖ ❖ ❖ ❖ ❖

REFERENCES

Aagaard, B.T., Blair, J.L., Boatwright, J., Garcia, S.H., Harris, R.A., Michael, A.J., Schwartz, D.P., and DiLeo, J.S., 2016, Earthquake Outlook for the San Francisco Bay Region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020, 6 p., http://dx.doi.org/10.3133/fs20163020.

American Society of Civil Engineers, 2010, Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-10.

Brabb, E.E., Graymer, R.W., and Jones, D.L., 2000, Geology of the Palo Alto 30 x 30 Minute Quadrangle, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2332.

California Building Standards Commission, and International Code Council, 2016 California Building Code, California Code of Regulations, Title 24, Part 2.

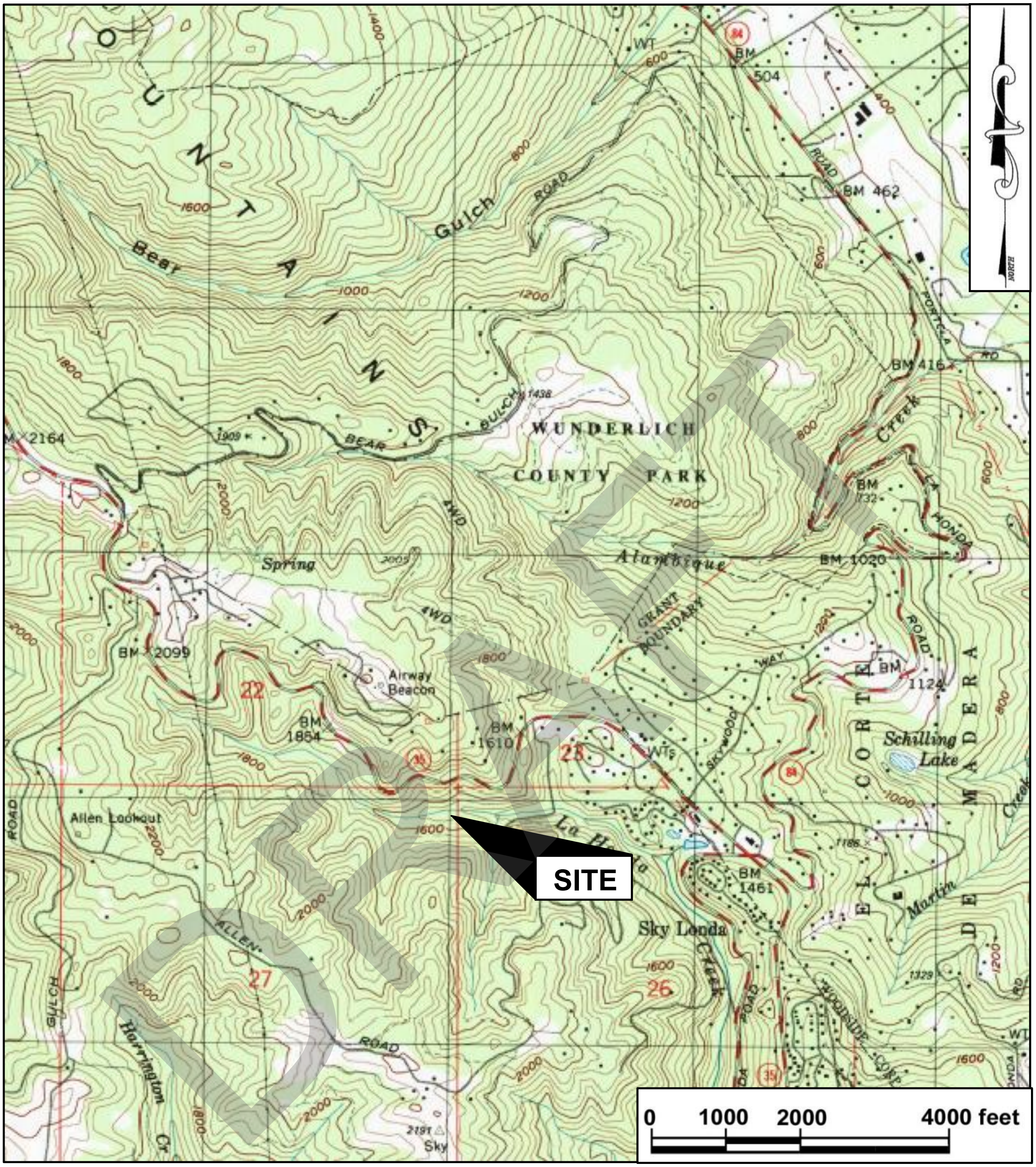
California Department of Conservation, Division of Mines and Geology (DMG), 1994, Fault-Rupture Hazard Zones in California, Special Publication 42.

California Geological Survey, 2011, Probabilistic Seismic Hazards Mapping Ground Motion Page, http://redirect.conservation.ca.gov/cgs/rghm/pshamap/pshamap.asp/

California Geological Survey, 2015, California Landslide Inventory, http://maps.conservation.ca.gov/cgs/lsi

United States Geological Survey, 2014, United States Seismic Design Maps, http://earthquake.usgs.gov/designmaps/us/application.php

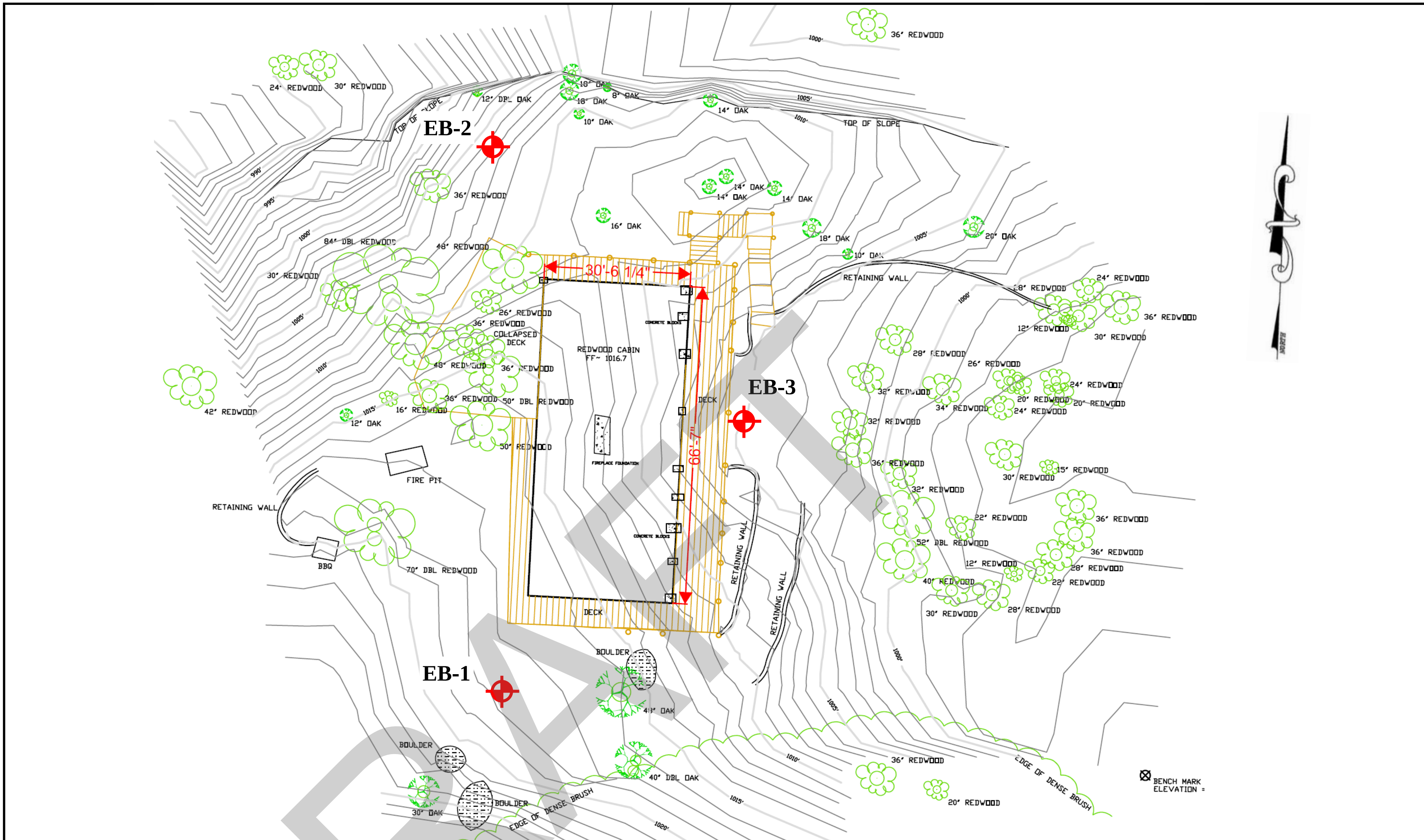
❖ ❖ ❖ ❖ ❖



Scale: 1 inch = 2000 feet
Base is United States Geological Survey Woodside 7.5 Minute Quadrangle, dated 1997.

VICINITY MAP **FIGURE 1**
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-1

ROMIG ENGINEERS



LEGEND

EB-3 Approximate Locations of Exploratory Borings.

Approximate Scale: 1 inch = 30 feet.

Base is site plan prepared by Sigma Prime Geosciences, dated July, 2019.

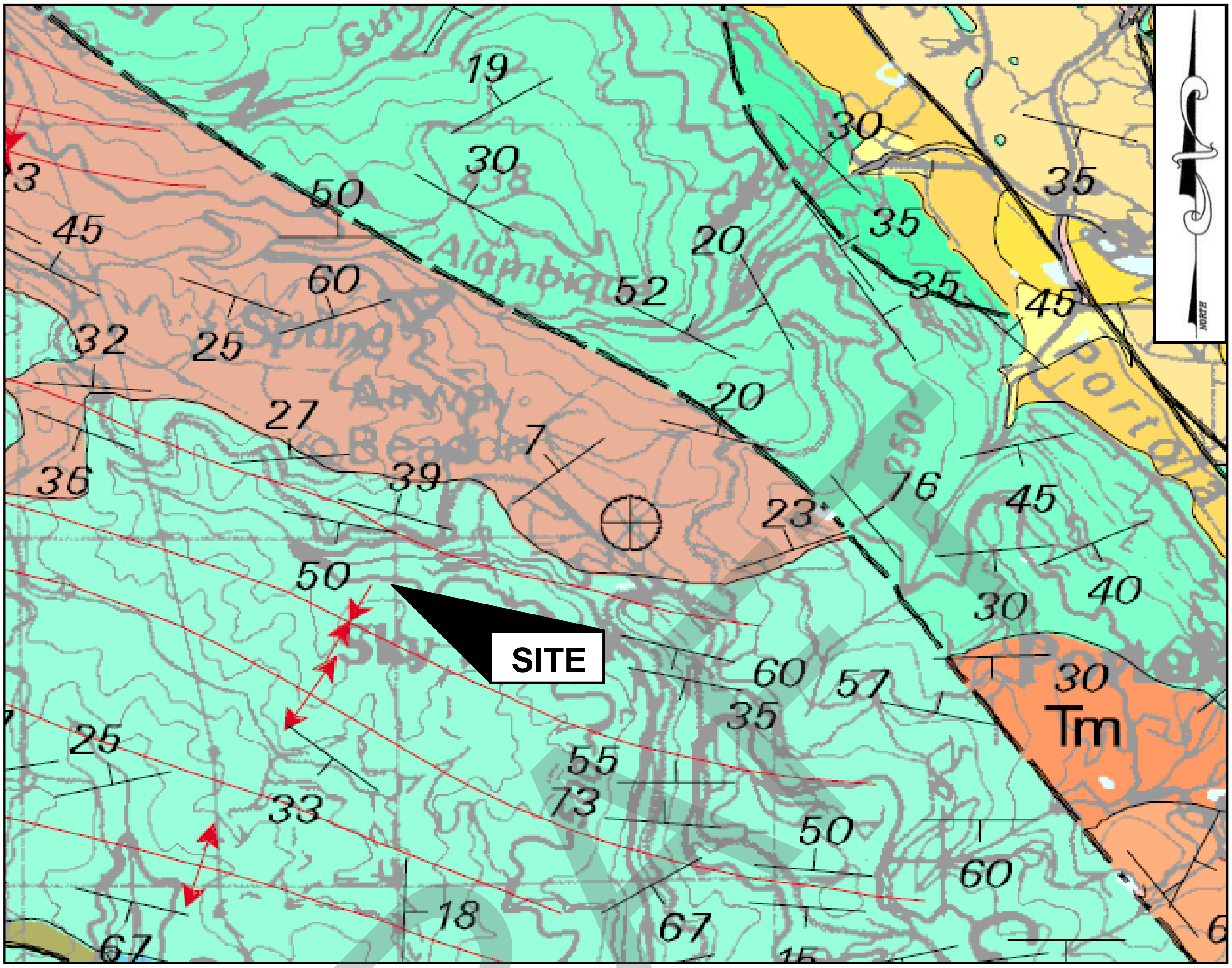
0 15 30 60 feet

SITE PLAN
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 2
OCTOBER 2019
PROJECT NO. 4907-1

ROMIG ENGINEERS

Attachment 1



LEGEND

Tb	Butano Sandstone
Tw	Whiskey Hill Formation
Tla	Lambert Shale
Tm	Monterey Formation

0 1000 2000 4000 feet

Geologic Contact - dashed where approximate, dotted where inferred.

Fault - dashed where approximate, dotted where inferred.

35

Strike and dip of bedding

Anticline

Syncline

Scale: 1 inch = 2000 feet

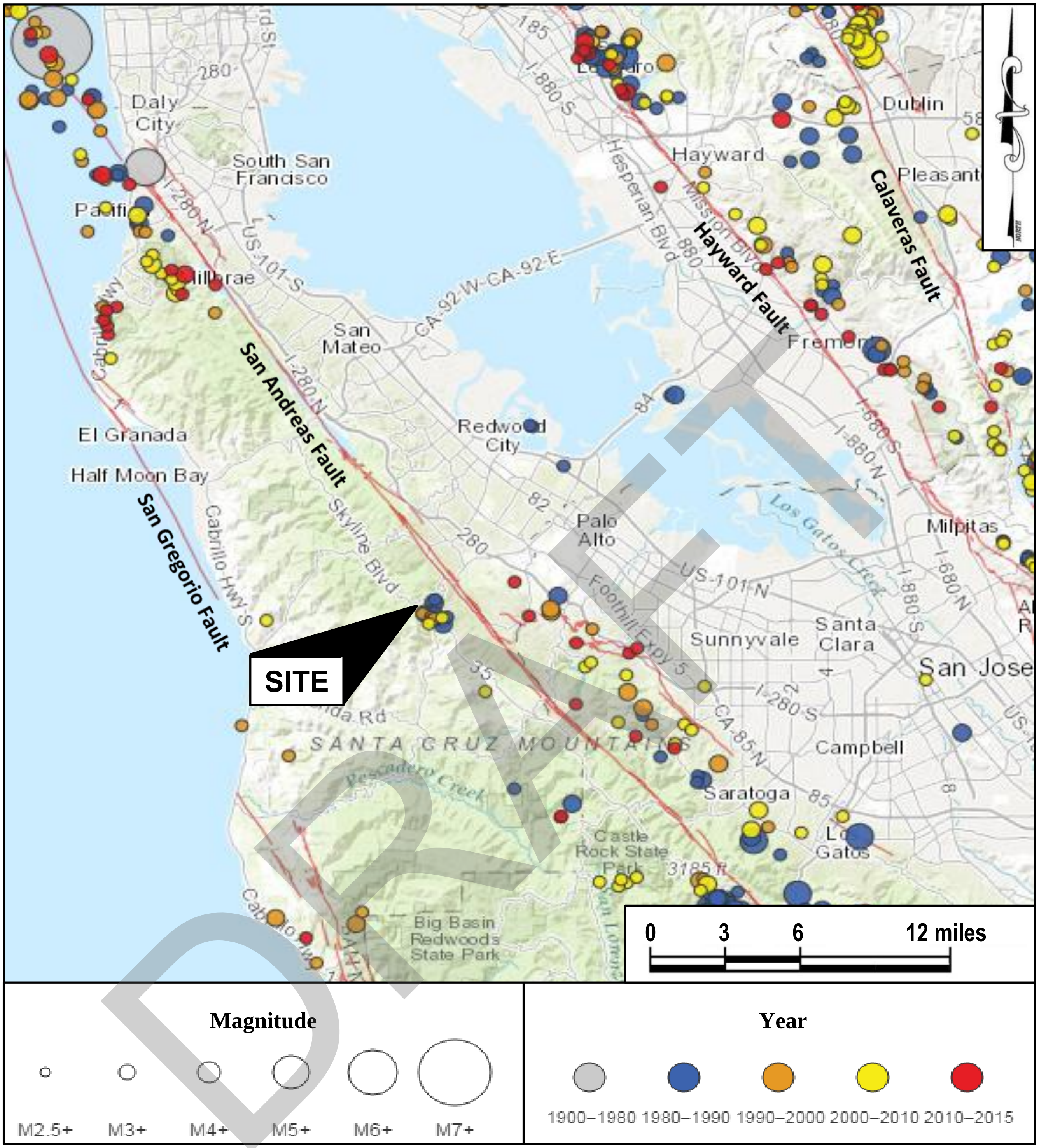
Base is Geologic Map of Palo Alto 30 x 60 Minute Quadrangle (Brabb, Graymer, and Jones, 2000).

VICINITY GEOLOGIC MAP **FIGURE 3**

MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-1

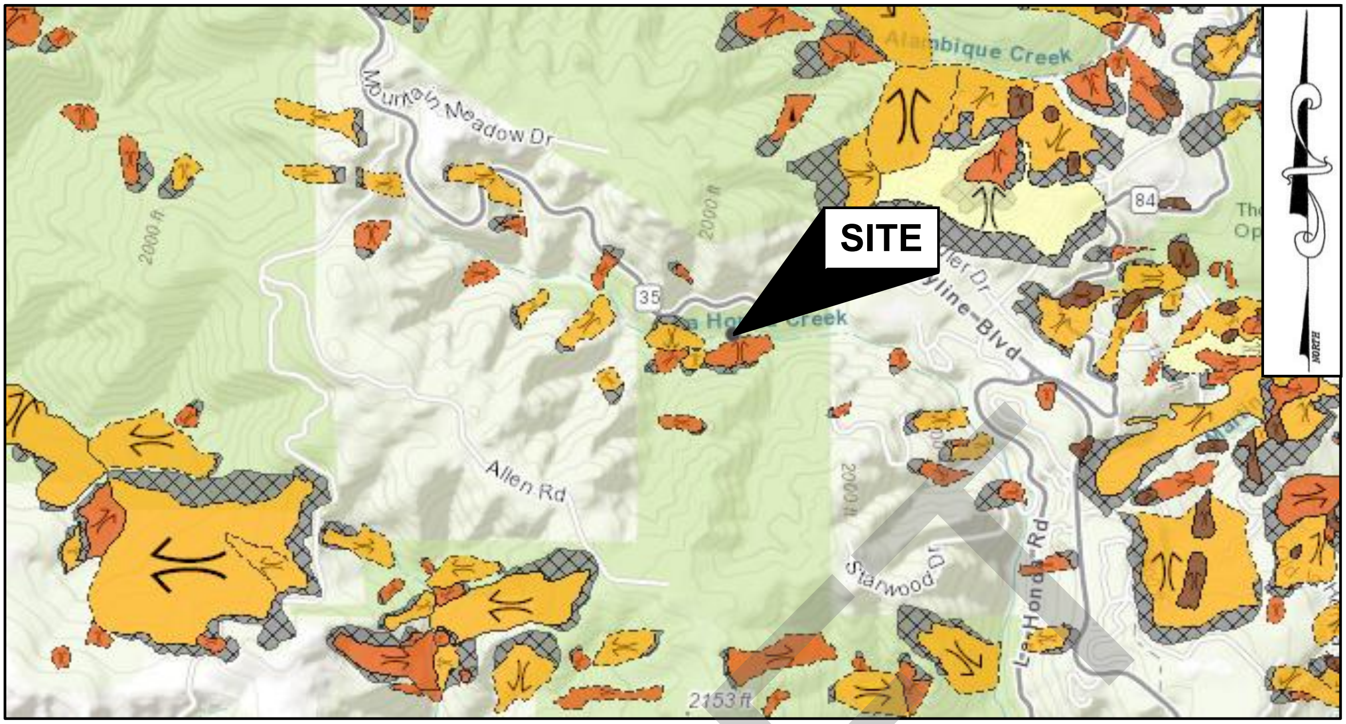
ROMIG ENGINEERS



Earthquakes with M5+ from 1900 to 1980, M2.5+ from 1980 to January 2015. Faults with activity in last 15,000 years. Based on data sources from Northern California Earthquake Data Center and USGS Quaternary Fault and Fold Database, accessed May 2015.

REGIONAL FAULT AND SEISMICITY MAP
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 4
OCTOBER 2019
PROJECT NO. 4907-1



LEGEND

Active/Historic

Dormant Young

Dormant Mature

Dormant Old/Relict

Dormant Age
Not Specified

Source Scarp

Rock Slide

0 1000 2000 4000 feet

Scale: 1 inch = 2000 feet
Base is California Geological Survey Landslide Inventory (State of California, 2015)

LANDSLIDE INVENTORY MAP
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 5
OCTOBER 2019
PROJECT NO. 4907-1

ROMIG ENGINEERS

APPENDIX A

FIELD INVESTIGATION

The soils encountered during drilling were logged by our representative and samples were obtained at depths appropriate to the investigation. The samples were taken to our laboratory where they were examined and classified in accordance with the Unified Soil Classification System. The logs of our borings, as well as a summary of the soil classification system (Figure A-1) and bedrock descriptions (Figure A-2) used on the logs, are attached.

Several tests were performed in the field during drilling. The standard penetration test resistance was determined by dropping a 140-pound hammer through a 30-inch free fall, and recording the blows required to drive the 2-inch (outside diameter) sampler 18 inches. The standard penetration test (SPT) resistance is the number of blows required to drive the sampler the last 12 inches, and is recorded on the borings log at the appropriate depth. The results of these field tests are also presented on the boring log. Soil samples were also collected using 2.5-inch and 3-inch O.D. drive samplers. The blow counts shown on the logs for these larger diameter samplers do not represent SPT values and have not been corrected in any way.

The approximate elevations and locations of the borings were established by pacing using the topographic survey prepared by Sigma Prime Geosciences, dated July 2019. The locations and elevations of the borings should be considered accurate only to the degree implied by the method used.

The boring logs and related information depict our interpretation of subsurface conditions only at the specific location and time indicated. Subsurface conditions and ground water levels at other locations may differ from conditions at the location where sampling was conducted. The passage of time may also result in changes in the subsurface conditions.

❖ ❖ ❖ ❖ ❖

USCS SOIL CLASSIFICATION

PRIMARY DIVISIONS			SOIL TYPE	SECONDARY DIVISIONS
COARSE GRAINED SOILS (< 50 % Fines)	GRAVEL	CLEAN GRAVEL (< 5% Fines)	GW	Well graded gravel, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVEL with FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SAND	CLEAN SAND (< 5% Fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SAND WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS (> 50 % Fines)	SILT AND CLAY Liquid limit < 50%		ML	Inorganic silts and very fine sands, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, lean clays.
			OL	Organic silts and organic clays of low plasticity.
	SILT AND CLAY Liquid limit > 50%		MH	Inorganic silt, micaceous or diatomaceous fine sandy or silty soil.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.
BEDROCK			BR	Weathered bedrock.

RELATIVE DENSITY

SAND & GRAVEL	BLOWS/FOOT*
VERY LOOSE	0 to 4
LOOSE	4 to 10
MEDIUM DENSE	10 to 30
DENSE	30 to 50
VERY DENSE	OVER 50

CONSISTENCY

SILT & CLAY	STRENGTH^	BLOWS/FOOT*
VERY SOFT	0 to 0.25	0 to 2
SOFT	0.25 to 0.5	2 to 4
FIRM	0.5 to 1	4 to 8
STIFF	1 to 2	8 to 16
VERY STIFF	2 to 4	16 to 32
HARD	OVER 4	OVER 32

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12 " 3" 0.75" 4 10 40 200

SIEVE OPENINGS — U.S. STANDARD SERIES SIEVE

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

* Standard Penetration Test (SPT) resistance, using a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler; blow counts not corrected for larger diameter samplers.

^ Unconfined Compressive strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.

KEY TO SAMPLERS

Modified California Sampler (3-inch O.D.)
Mid-size Sampler (2.5-inch O.D.)
Standard Penetration Test Sampler (2-inch O.D.)

WEATHERING

Fresh
Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very Slight
Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight
Rock generally fresh, joints stained, and discoloration extends into rock up to 1 inch. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate
Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some are clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately Severe
All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe
All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very Severe
All rock except quartz discolored and stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.

Complete
Rock reduced to "soil". Rock fabric not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

HARDNESS

Very hard
Cannot be scratched with knife or sharp pick. Hand specimens requires several hard blows of geologist's.

Hard
Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately Hard
Can be scratched with knife or pick. Gouges or grooves to 1/4 inch deep can be excavated by hard blow of point of a geologist's pick. Hard specimen can be detached by moderate blow.

Medium
Can be grooved or gouged 1/16 inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 inch maximum size by hard blows of the point of a geologist's pick.

Soft
Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be brocken by finger pressure.

Very Soft
Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

JOINT BEDDING AND FOLIATION SPACING

Spacing	Joints	Bedding and Foliation
Less than 2 in.	Very Close	Very Thin
2 in. to 1 ft.	Close	Thin
1 ft. to 3 ft.	Moderately Close	Medium
3 ft. to 10 ft.	Wide	Thick
More than 10 ft.	Very Wide	Very Thick

ROCK QUALITY DESIGNATOR (RQD)

RQD, as a percentage	Descriptor
Exceeding 90	Excellent
90 to 75	Good
75 to 50	Fair
50 to 25	Poor
Less than 25	Very Poor

KEY TO BEDROCK DESCRIPTIONS
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN
SAN MATEO COUNTY, CALIFORNIA

FIGURE A-2
OCTOBER 2019
PROJECT NO. 4907-1

ROMIG ENGINEERS

Attachment 1

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** RL

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 1018 feet **DATE DRILLED:** 8/8/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS∗ (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Colluvium: Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low to moderate plasticity.	Very Stiff to Hard	CL		0		31	18		
■ Liquid Limit = 39, Plasticity Index = 18.					■	48	18		
Residual Soil: Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low plasticity.	Hard	CL		5		36	17		
Butano Formation: Light brown, Clayey Sandstone, moist fine to coarse grained, very severely weathered, friable.	Soft	BR				27	16		
Transitions to siltstone at 8 feet.									
▲ Free Swell = 60%.				10	▲	16	26		
						22	21		
						19	16		
				15		23	17		
Bottom of Boring at 16 feet.									
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-1 **BORING EB-1**

MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-1

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** RL

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 1008 **DATE DRILLED:** 8/8/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Brown, Sandy Lean Clay, fine to moist grained sand, low plasticity.	Very Stiff	CL		0		26	13		
Butano Formation: Light brown, Sandstone, moist, fine to medium grained, very severely weathered, friable.	Soft	BR				58	10		
▲ Free Swell = 50%.				5	▲	42	12		
						50/6"	13		
						28	12		
				10		64			
						40	16		
				15		64	16		
Bottom of Boring at 15 feet.									
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-2 **BORING EB-2**

MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-1

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** RL

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 1005 feet **DATE DRILLED:** 8/8/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low plasticity.	Very Stiff	CL		0		26	24		
Butano Formation: Light brown, Sandstone, moist, fine to coarse grained, very severely weathered, friable.	Soft to Medium	BR				49	15		
				5		43	15		
▲ Free Swell = 20%.					▲	60	14		
						50/3"	13		
Bottom of Boring at 8.8 feet.				10					
				15					
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual. *Measured using Torvane and Pocket Penetrometer devices.				20					

APPENDIX B

LABORATORY TESTS

Samples from subsurface exploration were selected for tests to help evaluate the physical and engineering properties of the soils encountered at the site. The tests that were performed are briefly described below.

The natural moisture content was determined in accordance with ASTM D2216 on nearly all of the soil samples recovered from the borings. This test determines the moisture content, representative of field conditions at the time the samples were collected. The results are presented on the boring logs at the appropriate sample depths.

The Atterberg Limits were determined on one sample of soil in accordance with ASTM D4318. The Atterberg Limits are the moisture content within which the soil is workable or plastic. The results of this test are presented in Figure B-1 and on the log of Boring EB-1 at the appropriate sample depth.

❖ ❖ ❖ ❖ ❖

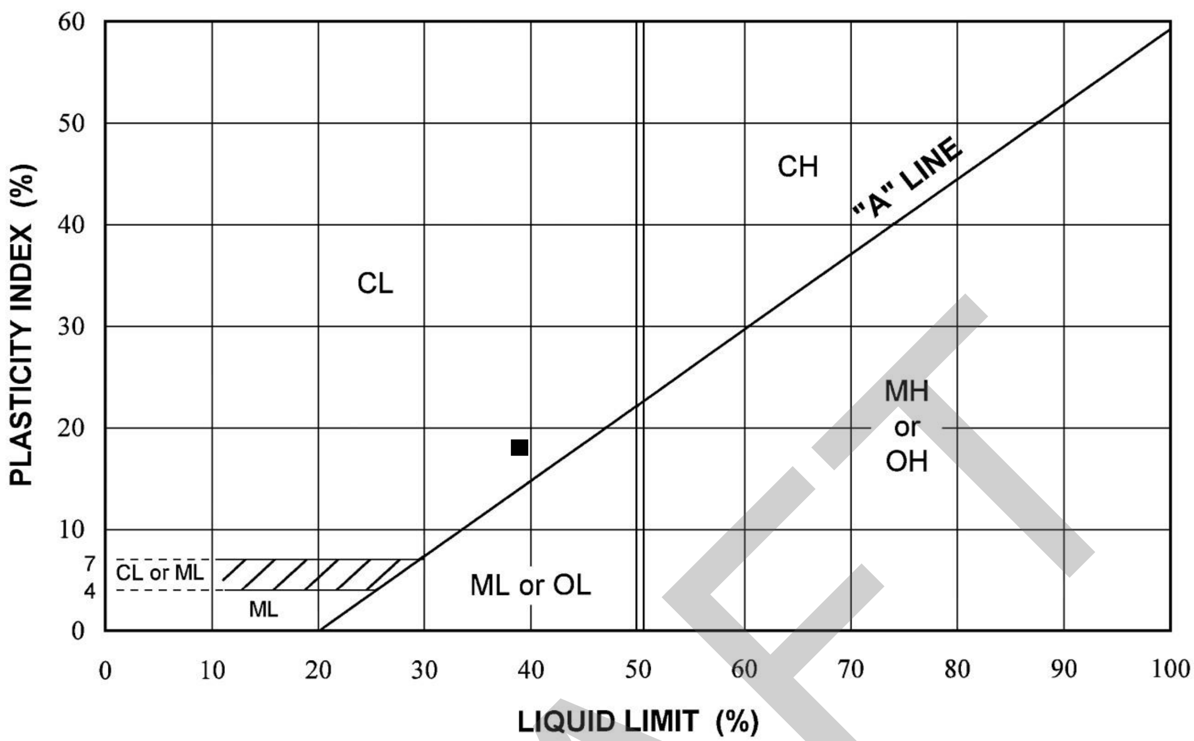


Chart Symbol	Boring Number	Sample Depth (feet)	Water Content (percent)	Liquid Limit (percent)	Plasticity Index (percent)	Liquidity Index (percent)	Passing No. 200 Sieve (percent)	USCS Soil Classification
■	EB-1	2-4	18	39	18	-17		CL

PLASTICITY CHART
MIDPENINSULA REGIONAL OPEN SPACE REDWOOD CABIN
SAN MATEO COUNTY, CALIFORNIA

FIGURE B-1
OCTOBER 2019
PROJECT NO. 4907-1

ROMIG ENGINEERS

Attachment 1

DRAFT

ROMIG ENGINEERS

ROMIG ENGINEERS, INC.

1390 El Camino Real, 2nd Floor

San Carlos, California 94070

Phone: (650) 591-5224

www.romigengineers.com

EXHIBIT D

Asbestos and Lead Survey

by Terracon Consultants, Inc.

Asbestos & Lead Survey

Three Buildings
Beatty House, La Honda White Barn, and La Honda Log Cabin
Midpeninsula Regional Open Space District

August 20, 2019
Revised November 14, 2019

Terracon Project No. R1197192

Prepared for:
ZFA Structural Engineers
San Carlos, CA 94070

Prepared by:
Terracon Consultants, Inc.
Emeryville, CA

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Terracon Consultants, Inc. (Terracon) conducted a pre-renovation asbestos and lead survey of three buildings, the Beatty House, La Honda White Barn, and La Honda Log Cabin near La Honda, California. We understand this asbestos survey was requested in support of the planned renovation of the building(s). The purpose of this survey was to sample and identify suspect materials and provide information regarding the identity, location, condition, and approximate quantities of asbestos containing materials (ACM), lead containing paint, mercury containing switches and light fixtures, PCB containing lighting ballasts and ozone depleting coolants. The survey was performed on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors in general accordance with the sampling protocols established in United State Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act, (AHERA). Terracon collected 89 bulk samples from homogeneous areas of suspect ACM.

Terracon collected seventy (70) samples from twenty-two (22) homogeneous area of suspected asbestos-containing materials (ACM). Laboratory analysis reported that seven (7) samples and two (2) materials contain asbestos.

Terracon collected two (2) paint chip samples from the La Honda Log cabin, one (1) from the La Honda White Barn, and six (6) from the Beatty House. Analysis of the paint samples reported that all of paint-chip samples had detectable concentrations of lead. One (1) sample from the La Honda White Barn and three (3) samples from the Beatty House had lead concentrations in excess of the California Department of Public Health definition of Lead-Based Paint.

HAZARDOUS MATERIALS SURVEY
ZFA - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin
Midpeninsula Regional Open Space District

Terracon Project No. R1197192
43697

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was contracted by ZFA Structural Engineers (ZFA) to conduct a hazardous materials survey of three buildings owned by the Midpeninsula Regional Open Space District, including the Beatty House near Los Gatos and the La Honda White Barn and La Honda Log Cabin near La Honda, California. The survey was conducted on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors. The survey included the interior and exterior building components. Homogeneous areas of suspect asbestos-containing materials (ACM), lead-containing paints, PCB containing lighting ballasts, mercury containing thermostats, and mercury containing lighting tubes were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled materials could be located in walls, in voids or in other concealed areas.

1.1 Scope of Work

The scope of the survey was as follows:

- Inspect the subject buildings for the presence of suspect ACMs, lead-containing paint, mercury-containing products, polychlorinated biphenyl lighting ballasts.
- Collect samples of suspect ACMs following a National Emissions Standards for Hazardous Air Pollutants (NESHAPS) protocol for sample collection for a demolition survey.
- Asbestos bulk samples will be analyzed using polarized light microscopy (PLM) in accordance with the EPA's July 1993 method for the determination of asbestos in bulk building materials - EPA 600/R-93/116.
- Collect bulk paint chip samples of primary painted surfaces and other materials suspected to be lead containing. Bulk samples will be analyzed at an accredited laboratory by Flame Atomic Absorption (AA) for Total Lead reported in parts per million (ppm).
- Submit written report including analytical results, regulatory requirements and conclusions.

The subject spaces included in the scope of were limited to:

- The interior and exterior of the Beatty House,
- The interior and exterior of the La Honda Log Cabin, and

- The interior and exterior of the La Honda White Barn.

2.0 ASBESTOS AND LEAD SURVEY

The survey was conducted by Mike Harrington and Mike Reed, asbestos inspectors. Mike Harrington is certified by the Division of Occupational Safety and Health (Cal/OSHA) as a Site Surveillance Technician (SST # 01-3017). Mike Reed is also certified by Cal/OSHA (SST # 08-4464). The survey was managed and supervised by Michael Benefield. Mr. Benefield is certified by Cal/OSHA as a Certified Asbestos Consultant (CAC # 06-3938). Terracon's project personnel's certifications can be found in Appendix E of this report. The survey was conducted in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to an accredited laboratory for analysis by Polarized Light Microscopy (PLM).

2.1 Visual Assessment of Suspect ACM

Survey activities were initiated with visual observation of the interior and exterior of the building to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application. Interior assessment was conducted in visually accessible areas of the building proposed for demolition.

Terracon typically investigated for flooring beneath carpeting by lifting small corner sections of carpet. If additional flooring was seen, they have been identified in the report. If flooring was not seen at corners under the carpet, it does not imply that there are no tiles beneath the carpeted floor. Terracon inspected the walls in multiple places throughout the building and did not observe additional coverings/layers except where noted in this report, but there may be areas of additional suspect material present within the building walls not investigated. Terracon did not inspect in concealed wall cavities or in sub grade areas.

2.2 Bulk Sampling Suspect ACM

Bulk samples were collected of homogeneous suspect materials that were within the area covered by the scope of work. A homogeneous material is defined as a surfacing material, thermal system insulation, or miscellaneous material that is uniform in color, texture and age of construction. Examples of homogeneous materials include:

- Pipe insulation produced by the same manufacturer and installed during the same time period;
- Resilient flooring of identical color and pattern;

- Troweled on surfacing materials located in contiguous areas.

The buildings were visually inspected for the presence of suspect materials. As materials were identified, bulk samples were obtained with the aid of a coring device or other hand tool and placed into individual sampling bags. Each sample was given a discreet identification number and recorded on field notes as well as chain of custody forms. Refer to accompanying tables and appendices for details on material sample locations and results.

2.3 Physical Assessment of Suspect ACM

A physical assessment of each homogeneous area (HA) of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

2.4 Sample Analysis of Suspect ACM

Bulk samples of suspect ACM were analyzed by EM Lab P&K of Phoenix, AZ. EML is accredited under the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program (NVLAP). Analysis was conducted by Polarized Light Microscopy (PLM) in accordance with EPA 600/R92-116 (1993) method. Asbestos content was determined by visual estimation. The lower quantitation limit of PLM is recognized to be 1%. To reliably determine that a material in which asbestos was detected by PLM, contains less than 1% asbestos the samples must be re-analyzed by PLM Point Count. In accordance with EPA assessment criteria, if a single sample of a homogeneous material tests positive for asbestos, all areas of that homogeneous material are considered to be asbestos-containing.

2.5 Bulk Sampling of Lead Paint and Suspect Bulk Materials

Paint chip and bulk samples were collected using a hand scraper or chisel and were placed into individual plastic sampling containers. Each sample was provided a discreet sample number, which was recorded on a chain of custody form. The samples were transported under chain of custody procedures to J3 Resources of Pasadena, TX. Please refer to Table III for details on sample locations and sample results. All paint and ceramic tile glazing samples were analyzed for lead content using the Flame Atomic Absorption spectroscopy in accordance to EPA Method SW846-7420.

3.0 FINDINGS AND RECOMMENDATIONS

3.1 Asbestos

The following asbestos-containing materials were identified as a result of laboratory analysis or assumed to be asbestos containing:

HM # / Material Description	General Material Location	NESHAP Category	Asbestos Type	Estimated Quantity
Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360
Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% chrysotile composite	3,700
NA = Not Applicable, CH = Chrysotile, lf = linear feet, sf = square feet, RACM = Regulated asbestos containing material (friable), Cat. I = Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), Cat. II = Category II Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), sf = square feet, lf = linear feet				

No asbestos was detected in any of the samples collected in the La Honda Log Cabin or in the La Honda White Barn. No identified materials were unable to be sampled and assumed to contain asbestos in any of the three buildings.

Vinyl sheet flooring in the Beatty House Living Room is friable ACM. Friable ACM is Regulated Asbestos-Containing Material (RACM) and must be removed prior to start of demolition or renovation activities. The wallboard system in the Beatty House has ACM joint compound. Composite analysis of the joint compound and the wallboard by PLM point count reported that the composite contained less than 1% asbestos. This material is not an ACM as defined by NESHAP and BAAQMD. However, Cal/OSHA does not allow composite analysis, so the joint compound is an ACM as defined by Cal/OSHA. All removal of ACM materials including materials non-friable materials left in the building must be conducted by a licensed and registered asbestos abatement contractor in accordance with 8CCR1529 and the BAAQMD Regulation 11 Rule 2. If additional suspect materials that have not been characterized in this report are discovered during demolition, these materials must be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.

A summary of the classification, condition and approximate quantity of identified ACM is presented in Appendix A. The summary of sample locations is presented in Appendix B. Laboratory analytical reports are included in Appendix C.

3.2 Lead-Containing Paints and Materials

Nine (9) painted surfaces were sampled and analyzed for potential lead content. Nine (9) of the painted surfaces were found to contain lead content above the laboratory detection limit. Four (4) painted surfaces were found to contain lead in concentrations exceeding 5,000 parts per million. The laboratory results for lead testing are summarized in Table III below.

TABLE III
LEAD SAMPLE RESULTS

Sample Number	Material Description and Location	Results mg/kg (ppm)	Lead-Containing	Lead-Based Paint
L-01	La Honda Log Cabin: Green paint on wood floor in the Log Cabin Kitchen	4,200	Y	N
L-02	La Honda Log Cabin: White paint on glass and wood on the Log Cabin south exterior	780	Y	N
L-03	La Honda White Barn:	48,000	Y	Y
L-04	Beatty House: Brown paint on wood exterior wall	1,500	Y	N
L-05	Beatty House: White paint on wood window frame	1,800	Y	N
L-06	Beatty House: White paint on wallboard wall in the living room	18,000	Y	Y
L-07	Beatty House: Brown paint on wood door frame between living room and kitchen	12,000	Y	Y
L-08	Beatty House: White paint on wood door frame in the kitchen	460	Y	N
L-09	Beatty House: White paint on glass and window frame on the exterior	43,000	Y	Y

mg/kg= Milligram per kilogram, ppm = parts per million

Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1). Disturbance of lead-based paints must be conducted in accordance with the EPA RRP rule.

4.0 REGULATORY SUMMARY

4.1 Asbestos

Disturbance of materials containing asbestos is regulated by Cal-OSHA in the Asbestos in Construction Industry Standard, 8 CCR 1529. Some of the key requirements are summarized below.

- Any individual who contracts to provide health and safety services relating to materials containing more than 0.1% asbestos must be certified by Cal-OSHA as either a Certified Asbestos Consultant or a Site Surveillance Technician. The activities that require certification include: conducting asbestos surveys; writing work plans or specifications for abatement; monitoring the work of abatement contractors; collecting air samples; and determining if the work area is safe for re-occupancy by non-asbestos workers. Regulation: Cal-OSHA 8 CCR 1529 (q)(1).
- If more than 100 square feet of materials that contain greater than 0.1% asbestos will be disturbed, the materials must be removed by a Cal-OSHA registered asbestos abatement contractor. Regulation: Cal-OSHA 8 CCR 1529 (r).
- ACMs that are classified by OSHA as thermal system insulation/surfacing materials are present. Removal of these materials is considered a Class I activity according to Cal-OSHA regulations. Work practices and engineering controls for Class I work are specified in Cal-OSHA 8 CCR 1529 (g) (4-6).
- ACMs that are classified by OSHA as other/miscellaneous materials are present. Removal of these materials is considered a Class II activity according to Cal-OSHA regulations. Work practices and engineering controls for Class II work are specified in Cal-OSHA 8 CCR 1529 (g) (7-8).
- Removal of friable ACMs greater than 100 square feet or 100 linear feet requires notification of the Bay Area Air Quality Management District ten (10) working days in advance of intended removal.
- Friable ACM waste must be manifested, transported, and disposed of as hazardous waste in accordance with the Department of Toxic and Substances Control (DTSC) and under a Waste Shipment Record as required by the Bay Area Air Quality Management District. DTSC regulates disposal of asbestos waste. DTSC issues U.S. EPA hazardous waste generator identification numbers.

4.2 Lead

Disturbing materials containing any detectable concentration of lead either through repair, maintenance, renovation or demolition activities triggers several regulations enforced by such agencies as OSHA (worker protection), EPA (environmental exposure, transportation and

disposal), and Department of Public Health (DPH). Some of the key requirements of the regulations are summarized below.

- There are presently no federal, state or local regulations limiting the concentration of lead in public sector buildings, however several regulations established for the private sector as well as for government subsidized housing are used industry wide as guidelines for assessing exposure to lead. The Consumer Product Safety Commission (CPSC) has set a maximum limit of 90 ppm in paint used for residential purposes. The Department of Housing and Urban Development (HUD) requires abatement of lead hazards involving paint in concentrations exceeding 5,000 ppm.
- Disposal of all lead-containing materials is regulated at concentrations at or exceeding 1,000 ppm as stated in 40 Code of Federal Regulations (CFR) Part 263 - Land Disposal Regulations and Title 22, Division 4 Environmental Health of the California Administrative Code. Lead containing materials that exceed 50 ppm must be additionally analyzed to determine possible waste disposal restrictions with respect to lead.
- Federal OSHA and Cal-OSHA regulate all worker exposure during construction activities that impact lead-containing paint. Cal-OSHA enforces the Lead in Construction Standard in Title 8 CCR 1532.1. The scope covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for re-painting, renovation, clean-up and routine maintenance. The OSHA specified method of compliance includes respiratory protection, protective clothing and equipment, housekeeping, hygiene facilities, medical surveillance, and training, among other requirements.

5.0 LIMITATIONS/GENERAL COMMENTS

Terracon did not perform sampling which required demolition or destructive activities such as knocking holes in walls, dismantling of equipment or removal of protective coverings. Reasonable efforts to access suspect materials within known areas of restricted access (e.g., crawl spaces) were made; however, confined spaces or areas which may pose a health or safety risk to Terracon personnel were not sampled. Sampling did not include suspect materials which could not be safely reached with available ladders/man-lifts.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the survey results, Terracon concludes the following:

- Asbestos was detected in various materials including vinyl floor tile and mastics, joint compound associated with drywall, thermal system insulation, ceramic tile mastic, sink undercoating, roof mastics, transite (asbestos cement) panels, metal roof cap sealant, and flashing sealant.
- If additional suspect materials that have not been characterized as ACM or non-ACM in this report are discovered during demolition, these materials should be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.
- Lead was detected above the laboratory detection limit on nine (9) various painted surfaces throughout the building. Two (2) of the painted surfaces had lead concentrations above 5,000 ppm, the threshold for designation of lead-based paint.

This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by ZFA Structural Engineers for specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

APPENDIX A
ZFA Structural Engineers - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin, Near

IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

HA No.	Material Description	Material Location	NESHAP Classification	% and Type Asbestos**	Estimated Quantity*
201	Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360 SF
204	Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% Chrysotile composite	3,700 SF

***Estimated quantities** are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey.
****% & Type Asbestos** = this column contains both the analytical result of the sample with the highest concentration of asbestos detected in the samples that make up the HA and the types of asbestos identified.

The materials listed in this table have been sampled and determined to contain asbestos in concentrations greater than 1%. When disturbed, various federal, state and local regulations may apply. These materials should be monitored for damage over time and repaired as necessary by appropriately trained personnel. Removal may be necessary before renovations and in most cases before a demolition. See Appendix B for a summary of samples collected. See Appendix C for detailed analytical results.

APPENDIX B

ASBESTOS SAMPLE LOCATION SUMMARY

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
Log Cabin							
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected	NA	NA	
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected	NA	NA	
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Orange Wood	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
3	3A	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected	NA	NA	
3	3B	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
3	3C	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
4	4A	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected	NA	NA	
4	4B	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
4	4C	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected	NA	NA	
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
6	6A	Wiring Black;Cabin	Black Coating	None detected	NA	NA	
6	6A	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6B	Wiring Black;Cabin	Black Coating	None detected			
6	6B	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6C	Wiring Black;Cabin	Black Coating	None detected			
6	6C	Wiring Black;Cabin	White Wiring Insulation	None detected			
7	7A	Concrete Foundation;Under Porch	White Concrete	None detected	NA	NA	
7	7B	Concrete Foundation;Under Porch	White Concrete	None detected			
7	7C	Concrete Foundation;Under Porch	White Concrete	None detected			
8	8A	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected	NA	NA	
8	8A	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8B	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8B	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8C	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8C	Wiring-White 1/8 in;Interior	Black Coating	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
9	9A	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9A	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
Barn							
100	100A	Wiring;Black 1/8 In;Interior Barn;N	Black Wiring Insulation	None detected	NA	NA	
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Wiring Insulation	None detected			
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Tar Insulator	None detected			
100	100C	Wiring;Black 1/8 In;Interior Barn;S	Black Wiring Insulation	None detected			
Beatty House							
200	200A	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected	NA	NA	
200	200B	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
200	200C	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
201	201A	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**	**Friable**	**Class 2**	**360 SF**
201	201A	Flooring Lino Tan; Living Rm	Black Felt	None detected	**RACM**		
201	201A	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201B	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201B	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201B	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201C	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201C	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201C	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected	NA	NA	
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
203	203A	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected	NA	NA	
203	203B	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			
203	203C	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
204	204A	Wallboard Joint Compound; Hall	Gray Fibrous Material with Multilayered Paint	None detected	**NA**	**Class 2**	**3,700 SF**
204	204A	Wallboard Joint Compound; Hall	White Drywall with Brown Paper and Multilayered Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Fibrous Material with White Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Drywall with Brown Paper	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Fibrous Material with White Paint	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Tan Joint Compound with Multilayered Paint**	**2% Chrysotile**			
204	204D	Wallboard Joint Compound; RR; West	White Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204E	Wallboard Joint Compound; East	Brown/Green Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	Cream Tape	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Joint Compound**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	White Drywall with Brown Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204F	Wallboard Joint Compound; South	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	Cream Tape	None detected			
204	204F	Wallboard Joint Compound; South	**Tan Joint Compound**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	White Drywall with Brown Paper	None detected			
204	204F	Wallboard Joint Compound; South	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204G	Wallboard Joint Compound; North	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	Cream Tape	None detected			
204	204G	Wallboard Joint Compound; North	**Tan Joint Compound**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	White Drywall with Brown Paper	None detected			
204	204G	Wallboard Joint Compound; North	**Composite by PLM Point Count**	**0.5% Chrysotile**			
205	205A	Flooring Hallway Gray; Hall; West	Black Felt with Pebbles and Gray Surface	None detected	NA	NA	
205	205B	Flooring Hallway Gray; Hall; Center	Black Felt with Pebbles and Gray Surface	None detected			
205	205C	Flooring Hallway Gray; Hall; East	Black Felt with Pebbles and Gray Surface	None detected			
206	206A	Cove Base/Flooring Creme Yellow Mastic; Kitchen; West	Cream Mastic with Yellow Paint	None detected	NA	NA	
206	206B	Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center	Cream Mastic with Yellow Paint	None detected			
206	206C	Cove Base/Flooring Creme Yellow Mastic; Kitchen; East	Cream Mastic with Yellow Paint	None detected			
207	207A	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected	NA	NA	
207	207B	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
207	207C	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Tan Linoleum with Fibrous Backing	None detected	NA	NA	
208	208A	Flooring Lino Tan; Kitchen; West	White Mastic	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Brown Fiberboard Flooring	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	Tan Linoleum with Fibrous Backing	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	White Mastic with Brown Fibrous Material	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Tan Linoleum with Fibrous Backing	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	White Mastic	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Brown Fiberboard Flooring	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
209	209A	Flooring Creme/Tan; Bath; East	Tan Flooring	None detected	NA	NA	
209	209A	Flooring Creme/Tan; Bath; East	Semi-Transparent Adhesive	None detected			
209	209A	Flooring Creme/Tan; Bath; East	Black Felt with Gray Coating	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Tan Flooring	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Semi-Transparent Adhesive	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Black Felt with Gray Coating	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Tan Flooring	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Semi-Transparent Adhesive	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Black Felt with Gray Coating	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Shingle with Green Pebbles	None detected	NA	NA	
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Tar	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Felt	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Shingle with Green Pebbles	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Tar	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Felt	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Felt	None detected			
211	211A	Concrete Porch	Gray Concrete	None detected	NA	NA	
211	211B	Concrete Porch	Gray Concrete	None detected			
211	211C	Concrete Porch	Gray Concrete	None detected			

APPENDIX C

ASBESTOS ANALYTICAL LABORATORY DATA

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin
EML ID: 2198987

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	27
Total Samples Analyzed:	27
Total Samples with Layer Asbestos Content > 1%:	0

Location: 1A, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North Lab ID-Version‡: 10447612-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1B, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North Lab ID-Version‡: 10447613-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1C, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North Lab ID-Version‡: 10447614-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 2A, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447615-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 2B, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447616-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Orange Wood	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 2C, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447617-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 3A, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447618-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 3B, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447619-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 3C, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447620-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 4A, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447621-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4B, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447622-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4C, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447623-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 5A, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447624-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5B, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447625-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5C, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447626-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6A, Wiring Black;Cabin Lab ID-Version‡: 10447627-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 6B, Wiring Black;Cabin

Lab ID-Version‡: 10447628-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6C, Wiring Black;Cabin

Lab ID-Version‡: 10447629-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 7A, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447630-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 7B, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447631-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 7C, Concrete Foundation;Under Porch Lab ID-Version‡: 10447632-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 8A, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447633-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8B, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447634-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8C, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447635-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 9A, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447636-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9B, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447637-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9C, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447638-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Attachment 1

002198987

Terracon

☐ PM – S. Steiner spsteiner@terracon.com

☐ PM – K. Schroeter kmschroeter@terracon.com

☐ PM – K. Pilgrim kmpilgrim@terracon.com

☐ PM – T. Kattchee tekattchee@terracon.com

☒ PM- M. Benefield msbenefield@terracon.com

☐ PM D. Block David.block@terracon.com

☐ PM – D.WALLEN d.wallen@terracon.com

☐ PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******
*****ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com *****

HM# 1	Material Description – Flooring – Lino 1X1 Squares Tan/Beige	
Sample ID	Sample Location & Material Location	Quantity: 120
1A	Rest Room – North	10X12
1B		
1C		

HM# 2	Material Description- Flooring – Lino Green Square Pattern	
Sample ID	Sample Location & Material Location	Quantity: 625
2A	Kitchen – West	25X25
2B		
2C		

HM# 3	Material Description- Window Glaze	
Sample ID	Sample Location & Material Location	Quantity: 18ea 300 LF
3A	ext window Glaze-South Glass to Frame	
3B		
3C		

HM# 4	Material Description Fire place Brick/mortar	
Sample ID	Sample Location & Material Location	Quantity: 1500 SF
4A	Living Rm – South	
4B		
4C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

002198987

Attachment 1

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kattchee takattchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 2 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# RI197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-5DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******
*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 5	Material Description – Roof felt Double Layer under wood Shingle	
Sample ID	Sample Location & Material Location	Quantity:
5A	Roof	
5B			
5C			

HM# 6	Material Description- wiring Black 3/4	
Sample ID	Sample Location & Material Location	Quantity:
6A	cabin	
6B			
6C			

HM# 7	Material Description- concrete foundation	
Sample ID	Sample Location & Material Location	Quantity:
7A	under Porch	
7B			
7C			

HM# 8	Material Description wiring – white 1/8 in	
Sample ID	Sample Location & Material Location	Quantity:
8A	Interior	
8B			
8C			

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 95
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

DRAFT

002198987

Attachment 1

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kattchee takattchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 9	Material Description – wiring – Black ¼ in	
Sample ID	**Sample Location & Material Location**	**Quantity:**
9A	cabin	
9B	|	
9C	|	

HM#	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**

HM#	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**

HM#	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 9sc
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-LA Honda White Barn
EML ID: 2198983

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

REVISED REPORT

Dates of Analysis:
Asbestos PLM: 07-09-2019 and 07-10-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	3
Total Samples Analyzed:	3
Total Samples with Layer Asbestos Content > 1%:	0

Location: 100A, Wiring;Black 1/8 In;Interior Barn;N

Lab ID-Version‡: 10447309-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100B, Wiring;Black 1/8 In;Interior Barn;C

Lab ID-Version‡: 10447310-2

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Black Tar Insulator	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100C, Wiring;Black 1/8 In;Interior Barn;S

Lab ID-Version‡: 10447311-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

SUMMARY OF REVISIONS

Location: 100B; Wiring;Black 1/8 In;Interior Barn;C Lab ID-Version‡: 10447310-2
Analysis Time revised. Sample Layers revised.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

002198983

Attachment 1

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM O. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA WHITE BARN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 100	Material Description – Wiring – Black 1/8 in	
Sample ID	**Sample Location & Material Location**	**Quantity:** 80 LF
100A	Interior Barn - N	
100B	- C	
100C	- S	

HM# 101	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
101A		
101B		
101C		

HM# 102	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
102A		
102B		
102C		

HM# 103	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**
103A		
103B		
103C		

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 930
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2198988

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

DRAFT

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	40
Total Samples Analyzed:	40
Total Samples with Layer Asbestos Content > 1%:	7

Location: 200A, Window Putty; Ext Windows

Lab ID-Version‡: 10447674-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200B, Window Putty; Ext Windows

Lab ID-Version‡: 10447675-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200C, Window Putty; Ext Windows

Lab ID-Version‡: 10447676-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 201A, Flooring Lino Tan; Living Rm

Lab ID-Version‡: 10447677-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 201B, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447678-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 201C, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447679-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 202A, Flooring Multi Layer; Back Room; 4 Lab ID-Version‡: 10447680-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202B, Flooring Multi Layer; Back Room; 4

Lab ID-Version‡: 10447681-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202C, Flooring Multi Layer; Back Room; 4 — Lab ID-Version‡: 10447682-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 203A, Flooring Dark Gray Flower Pat; Bedroom 1 — Lab ID-Version‡: 10447683-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203B, Flooring Dark Gray Flower Pat; Bedroom 1 — Lab ID-Version‡: 10447684-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203C, Flooring Dark Gray Flower Pat; Bedroom 1 — Lab ID-Version‡: 10447685-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204A, Wallboard Joint Compound; Hall — Lab ID-Version‡: 10447686-1

Sample Layers	Asbestos Content
Gray Fibrous Material with Multilayered Paint	ND
White Drywall with Brown Paper and Multilayered Paint	ND
Composite Non-Asbestos Content:	20% Cotton 10% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 204B, Wallboard Joint Compound; Ceil; Living Rm — Lab ID-Version‡: 10447687-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204C, Wallboard Joint Compound; Ceil; Back; 4 — Lab ID-Version‡: 10447688-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204D, Wallboard Joint Compound; RR; West — Lab ID-Version‡: 10447689-1

Sample Layers	Asbestos Content
Tan Joint Compound with Multilayered Paint	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Moderate

Comments: Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204E, Wallboard Joint Compound; East Lab ID-Version‡: 10447690-1

Sample Layers	Asbestos Content
Brown/Green Paper	ND
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204F, Wallboard Joint Compound; South Lab ID-Version‡: 10447691-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204G, Wallboard Joint Compound; North Lab ID-Version‡: 10447692-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205A, Flooring Hallway Gray; Hall; West

Lab ID-Version‡: 10447693-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205B, Flooring Hallway Gray; Hall; Center Lab ID-Version‡: 10447694-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 205C, Flooring Hallway Gray; Hall; East Lab ID-Version‡: 10447695-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 206A, Cove Base/Flooring Creme Yellow Mastic; Kitchen; West Lab ID-Version‡: 10447696-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 206B, Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center Lab ID-Version‡: 10447697-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 206C, Cove Base/Flooring Creme Yellow Mastic; Kitchen; East Lab ID-Version‡: 10447698-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 207A, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447699-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207B, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447700-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207C, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447701-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 208A, Flooring Lino Tan; Kitchen; West Lab ID-Version‡: 10447702-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 208B, Flooring Lino Tan; Kitchen; Center Lab ID-Version‡: 10447703-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic with Brown Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 208C, Flooring Lino Tan; Kitchen; East Lab ID-Version‡: 10447704-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 209A, Flooring Creme/Tan; Bath; East Lab ID-Version‡: 10447705-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 209B, Flooring Creme/Tan; Bath; Center Lab ID-Version‡: 10447706-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 209C, Flooring Creme/Tan; Bath; West Lab ID-Version‡: 10447707-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 210A, Roofing; Shingles; Green; Roof; NW Lab ID-Version‡: 10447708-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 210B, Roofing; Shingles; Green; Roof; SW Lab ID-Version‡: 10447709-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 210C, Roofing; Shingles; Green; Roof; West Lab ID-Version‡: 10447710-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	12% Glass Fibers 10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 211A, Concrete Porch Lab ID-Version‡: 10447711-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211B, Concrete Porch Lab ID-Version‡: 10447712-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211C, Concrete Porch Lab ID-Version‡: 10447713-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Attachment 1

002198988

Terracon

☐PM – S. Steiner sosteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kaltchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 200	Material Description – WINDOW Putty	
Sample ID	Sample Location & Material Location	Quantity: 200 LF
200A	Ext windows	14 windows
200B		3x4
200C		

HM# 201	Material Description- Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 360 S.F
201A	Living Rm	18x20
201B		
201C		

HM# 202	Material Description- Flooring multi layer	
Sample ID	Sample Location & Material Location	Quantity: 625 SF
202A	Back Room -4	25x25
202B		
202C		

HM# 203	Material Description flooring Dark Gray flower pat	
Sample ID	Sample Location & Material Location	Quantity: 320 S.F
203A	Bed room -1 –	16X20
203B		
203C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

Attachment 1

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kaltchee takaltchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 2 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 204	Material Description – wallboard joint compound	
Sample ID	Sample Location & Material Location	Quantity:
204 A	Hall –	(480 sq ft House)
B	ceil – Living Rm	
C	ceil – Back Rm – 4	
HM# 204	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
D	RR – west	
E	East	
F	South	
HM# 204	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
204 G	North	
HM#	Material Description	
Sample ID	Sample Location & Material Location	Quantity:

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

002198988

Attachment 1

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples) -
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 205	Material Description – Flooring Hallway Gray	
Sample ID	Sample Location & Material Location	Quantity: 110 SF
205A	Hall – west	27X4
205 B	– center	
205C	– East	

HM# 206	Material Description- Cove base/ flooring Creme Yellow mastic	
Sample ID	Sample Location & Material Location	Quantity: 200 S.F
206A	Kitchen – west	14X4
206 B	– center	
206 C	– East	

HM# 207	Material Description- Flooring Peach / TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
207A	Bedroom 2 –	12X16
207 B	–	
207 C	–	

HM# 208	Material Description Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
208A	Kitchen – West	14X14
208 B	– center	
208 C	– East	

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	MCS	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET**
	☐PM – T. Kattchee takattchee@terracon.com		☒ PLM Analysis (Analyze all samples)
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	☐ Stop Analysis at First Positive
☐PM – W. Frieszell wmfrieszell@terracon.com			☐ Point Count Analysis (1000-point)
			PAGE 4 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 209	**Material Description –** Flooring creme / TAN	
Sample ID	**Sample Location & Material Location**	**Quantity:** 200 sf
209A	Bath - East	
209B	- center	
209C	- west	
HM# 210	**Material Description-** Roofing - shingles - Green	
Sample ID	**Sample Location & Material Location**	**Quantity:** 600 sf
210 A	Roof - NW	
210 B	- SW	
210 C	- west	
HM# 211	Material Description- concrete	
Sample ID	**Sample Location & Material Location**	**Quantity:**
211A	porch -	
211B	-	
211C	-	
HM#	**Material Description**	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 9:5
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

APPENDIX D

LEAD ANALYTICAL LABORATORY DATA

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Lead Paint Chip Analysis Report

Report Number: 19-07-01313

Client: Eurofins EMLab P&K
4101 Shuffel Street NW
North Canton, OH 44720

Received Date: 07/09/2019
Analyzed Date: 07/10/2019
Reported Date: 07/10/2019

Project/Test Address: 2199222
Collection Date:

Client Number: 201676

Fax Number: 330-497-0772

Laboratory Results

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
19-07-01313-001	L-1		4200	0.42	
19-07-01313-002	L-2		780	0.078	

Preparation Method: ASTM E-1979-17
Analysis Method: EPA SW846 7000B
Accreditation #: OH 10028

Reviewed By Authorized Signatory:

Tariq Mohammed
QC Clerk

The HUD lead guidelines for lead paint chips are 0.50% by Weight, 5000 ppm, or 1.0 mg/cm². The Reporting Limit (RL) for samples prepared by ASTM E-1979-17 is 10.0 ug Total Pb. The RL for samples prepared by EPA SW846 3050B is 25.0 ug Total Pb. Paint chip area and results are calculated based on area measurements determined by the client. All internal quality control requirements associated with this batch were met, unless otherwise noted.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, area, etc., was provided by the client. Results reported above in mg/cm3 are calculated based on area supplied by client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C.

ELLAP Accredtitation through AIHA-LAP, LLC (100420), NY ELAP #11714.

LEGEND	Pb= lead	ug = microgram	ppm = parts per million
	ug/g = micrograms per gram	Wt. = weight	

2 [initials] 7/9/19

EHS Laboratories™

Environmental Hazards Services, LLC

Lead Chain-of-Custody Form

SHIP TO: 7469 Whitepine Rd. Richmond, VA 23237
Phone: (800) 347-4010 FAX: (804) 275-4907
ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT:
www.leadlab.com

19-07-01313
Due Date:
07/10/2019
(Wednesday)
E
EG

Attachment 1

Company Name: Eurofins EMLab P&K **Account Number:** 201676

Address: 1501 W Knudsen Dr **City/State/Zip:** Phoenix AZ 85027

Phone : 623) 298-1014 **Email :** ahetherington@emlabpk.com **Fax:**

Project Name / Testing Address: 2199222 **Project City/State (Required):**

Collected By: **Certification Number:** **P.O. #:**

Do wipe samples submitted meet ASTM E1792 requirements? ◯ Yes ◯ No

Sample Type - Key For Grid		Sample Location Abbreviations - Key For Grid					Surface Type for Dust Wipes – Key For Grid	
Single Dust Wipe = DW	Air = A	FR = Family Room	F = Front	1 = 1stFL	BA = Bath	BR = Bedroom	FL = Floor	SL = Window Sill
Paint Chip = PC	Soil = S	LR = Living Room	R = Rear	2 = 2ndFL	DR = Dining Room	O = Basement	CP = Carpet	WW = Window Well
Composite Soil = CS		DN = Den	LT = Left	RT = Right	KT = Kitchen			

TURN AROUND TIMES: IF NO TAT IS SPECIFIED, SAMPLE(S) WILL BE PROCESSED AND CHARGED AS 3 DAY TAT.

◉ 1 Day ◯ 2 Day ◯ 3 Day ◯ * Same Day – Must Call Ahead ◯ * Weekend - Must Call Ahead

No.	Client Sample ID	Collection Date	Collection Time	Sample Type	Collection Location (LR, KT, LTFBR, RTRBR, etc.)	Surface Type	Area: Length X Width in inches (Provide paint chip area only if requesting mg/cm2)	Paint Chip: mg/cm²	Paint Chip: % by weight	Air: Total Time (minutes)	Air: Flow Rate (L/min)	Air: Volume Total (Liters)	Comments
1	L-1		A.M./P.M.	PC			X	X		>PPM / % by weight per Kara 7/9/19			
2	L-2		A.M./P.M.	PC			X	X					
3			A.M./P.M.				X						
4			A.M./P.M.				X						
5			A.M./P.M.				X						
6			A.M./P.M.				X						
7			A.M./P.M.				X						
8			A.M./P.M.				X						
9			A.M./P.M.				X						
10			A.M./P.M.				X						

Released by: Kendra Griffith	Signature: K Griffith	Date/Time: 7/5/19
Received by: D. Emory	Signature: D. Emory	Date/Time: 7/9/19 11:05AM

Attachment 1

002199222

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐PM – S. Steiner ssteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒PM- M. Benefield msbenefield@terracon.com	☐PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kattchee tdkattchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-1	Paint Color: Green Substrate: wood Component: Floor Sample Location: Bldg # cabin Unit # west Room Kit	F
L-2	Paint Color: white Substrate: Glass wood Component: window Sample Location: Bldg # cabin Unit # South Room Ext	F
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	7-3-19 7/5/19 FedEx 950
Received By:		**Signature:**		**Date/ Time:**	
Received By:		**Signature:**		**Date/Time:**	

DRAFT

Attachment 1

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #: JP191014468
Project #: 3042679
Receipt Date: 8-Jul-2019
Analysis Date: 10-Jul-2019
Report Date: 10-Jul-2019

2199099

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-3	Paint Chip	48000	4.8%

Reporting Limit = 50.0 mg/kg N/A = Not Applicable
INS = Insufficient Sample Weight NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

14468

J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
		City/State:	North Canton, OH **Zip:** 44720
City/State:	Phoenix, AZ **Zip:** 85027	**PO #:**	3042679 Per S.D./n.t.

Project Information

Project Name: 2199099	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☐	2 Day ☐	3 Day ☑	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS

Flame AA	Graphite Furnace AA - LEAD	ICP
☒ Lead in Paint – SW846 7420/3050B ○ Lead in Air – NIOSH 7082 ○ Lead in Wipes – SW846 7420/3050B ○ Lead in Soil – SW846 7420/3050B	○ Drinking Water – EPA 200.9 ○ Wastewater – SW846-7421 ○ Soil/Sludge – SW846-7421 ○ Air – NIOSH 7105	○ Elements in Air – NIOSH 7300 ○ Wipe/Soil – SW846-6010B ○ Effluent – SW846-6010B ○ Welding Fume – NIOSH 7300M ○ TCLP – SW846-1311/6010B

SILICA/PARTICULATES

X-Ray Diffraction / Gravimetric
○ Respirable Crystalline Silica NIOSH 7500 / OSHA 142 ○ NIOSH 0500 – Total Particulates ○ NIOSH 0600 – Respirable Particulates

Total Number of Samples Submitted: 1

Positive Stop: ☐ YES ☐ NO

Signatures

Relinquished By: [signature]	Date: 7/5/19	Time:
Received By: [signature] Ruby Gonzalez	Date: 7/8/19	Time: 9:30
Relinquished By:	Date:	Time:
Received By:	Date:	Time:

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

J3 Resources, Inc. • 6110 West 34th Street • Houston, Texas 77092 • tel: 713/290-0221 • fax: 713/290-0248

IH CHAIN OF CUSTODY

Attachment 1

Project Name/Number 2199099

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-3		

Comments/Special Instructions:

Attachment 1

002199099

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant	
☐ PM – S. Steiner spsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com	

☐ PM – K. Pilgrim kimpilgrim@terracon.com	☒ PM- M. Benefield mabenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kettchee jakettchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA WHITE BARN

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem (Other) Emlab

TAT ☐ Rush ☐ 24HRS ☐ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-3	Paint Color: White Substrate: Wood Component: Siding Sample Location: Bldg # upper strip under eve Unit # Barn Room ext	P
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	7-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 930
Received By:		Signature:		Date/Time:	

DRAFT

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2199075

Approved by:

Joshua T. Cox

Operations Manager
Joshua Cox

Dates of Analysis:
Lead Analysis (sub-contracted): 07-09-2019

DRAFT

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the samples as received.

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #: JP191014467
Project #: 3042648
Receipt Date: 8-Jul-2019
Analysis Date: 9-Jul-2019
Report Date: 9-Jul-2019

2199075

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-4	Paint Chip	1500	0.15%
L-5	Paint Chip	1800	0.18%
L-6	Paint Chip	18000	1.8%
L-7	Paint Chip	12000	1.2%
L-8	Paint Chip	460	0.046%
L-9	Paint Chip	43000	4.3%

Reporting Limit = 50.0 mg/kg N/A = Not Applicable
INS = Insufficient Sample Weight NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

14467 (Lab use only)

Attachment J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
		City/State:	North Canton, OH **Zip:** 44720
City/State:	Phoenix, AZ **Zip:** 85027	**PO #:**	3042648 Per D.H./n.t.

Project Information

Project Name: 2199075	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☑	2 Day ☐	3 Day ☐	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS

Flame AA	Graphite Furnace AA - LEAD	ICP
☒ Lead in Paint – SW846 7420/3050B ○ Lead in Air – NIOSH 7082 ○ Lead in Wipes – SW846 7420/3050B ○ Lead in Soil – SW846 7420/3050B	○ Drinking Water – EPA 200.9 ○ Wastewater – SW846-7421 ○ Soil/Sludge – SW846-7421 ○ Air – NIOSH 7105	○ Elements in Air – NIOSH 7300 ○ Wipe/Soil – SW846-6010B ○ Effluent – SW846-6010B ○ Welding Fume – NIOSH 7300M ○ TCLP – SW846-1311/6010B

SILICA/PARTICULATES

X-Ray Diffraction / Gravimetric
○ Respirable Crystalline Silica NIOSH 7500 / OSHA 142 ○ NIOSH 0500 – Total Particulates ○ NIOSH 0600 – Respirable Particulates

Total Number of Samples Submitted: 6 | **Positive Stop:** ☐ YES ☐ NO

Signatures

Relinquished By:	2K Way	**Date:**	7/5/19	**Time:**	
Received By:	Ruby Gonzalez	**Date:**	7/8/19	**Time:**	9:30am
Relinquished By:		**Date:**		**Time:**	
Received By:		**Date:**		**Time:**	

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

Attachment 1

IH CHAIN OF CUSTODY

Project Name/Number 2199075   Page 2 of 2

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-4		
L-5		
L-6		
L-7		
L-8		
L-9		

Comments/Special Instructions:

Attachment 1

002199075

Terracon

E-MAIL REPORT TO: PROJECT MANAGER (PM)

☐ denise.walten@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant			
☐ PM – S. Steiner spsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com			
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Friesell wmfriesell@terracon.com	☐ PM – T. Kaitchee tnkaitchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EnLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-4	Paint Color: Brown Substrate: wood Component: wall Sample Location: Bldg # ext wall Unit # west Room	P
L-5	Paint Color: White Substrate: wood Component: window Sample Location: Bldg # window frame Unit # Room	P
L-6	Paint Color: White Substrate: Drywall Component: wall Sample Location: Bldg # Unit # Room Liv Rm	P
L-7	Paint Color: Brown Substrate: wood Component: Door frame Sample Location: Bldg # Unit # Room Liv / kit	P
L-8	Paint Color: White Substrate: wood Component: Kit Sample Location: Bldg # Unit # Door frame Room wall	P

Relinquished By: M.HARRINGTON Signature: MH Date/Time: 7-3-19

Received By: Signature: Date/Time: 7/5/19 FedEx 930

Received By: Signature: Date/Time:

Attachment 1

002199075

Terracon

E-MAIL REPORT TO: PROJECT MANAGER (PM)

☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant
☐PM – S. Steiner spsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com

☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒PM- M. Benefield msbenefield@terracon.com	☐PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kaltchee tekaltchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) ____ TTLC

PAGE 2 OF 2

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-9	Paint Color: White Substrate: window putty Component: Glass Wood Sample Location: Bldg # ____ Unit # ____ Room Ext 14 windows 4x5 200 LF	F
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	

Relinquished By:	M.HARRINGTON	**Signature:**	MH [signature]	**Date/Time:**	7-3-19 7/5/19 FedEx 950
Received By:		**Signature:**		**Date/ Time:**	
Received By:		**Signature:**		**Date/Time:**	

APPENDIX E

LICENSES AND CERTIFICATIONS

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Michael H Reed
Name

Certification No. **08-4464**

Expires on **12/18/19**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 1

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
 Micheal Reed	Lead Sampling Technician	LRC-00000224	5/21/2020

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

Attachment 1

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Michael D Harrington
Name

Certification No. **01-3017**

Expires on **12/05/19**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.


State of California Department of Public Health
Lead-Related Construction Certificate
Certificate Type
Expiration Date
Project Monitor 04/26/2020
Sampling Technician 04/26/2020
Michael D. Harrington
ID #: 2207

Attachment 1

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Michael S Benefield
Name

Certification No. 06-3938

Expires on 02/15/20

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 1

APPENDIX F

PHOTOGRAPHS

Photo 1 La Honda Log Cabin

Photo 2 La Honda White Barn

Photo 3 Beatty House

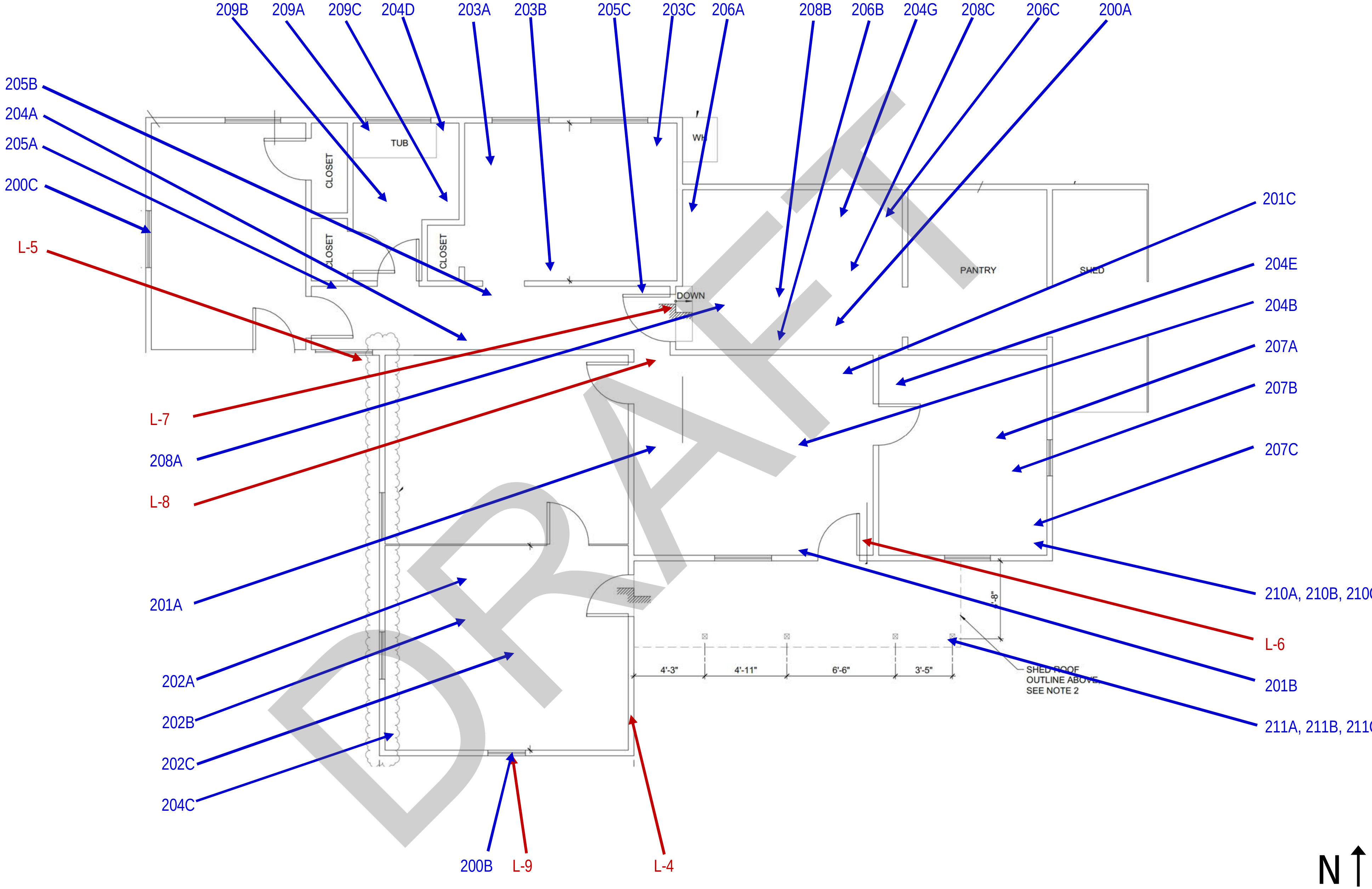
Photo 4 Material 204 - ACM joint Compound on wallboard walls and ceilings in the Beatty House


Photo 5 Material 201 ACM vinyl sheet flooring in the Beatty House

APPENDIX G

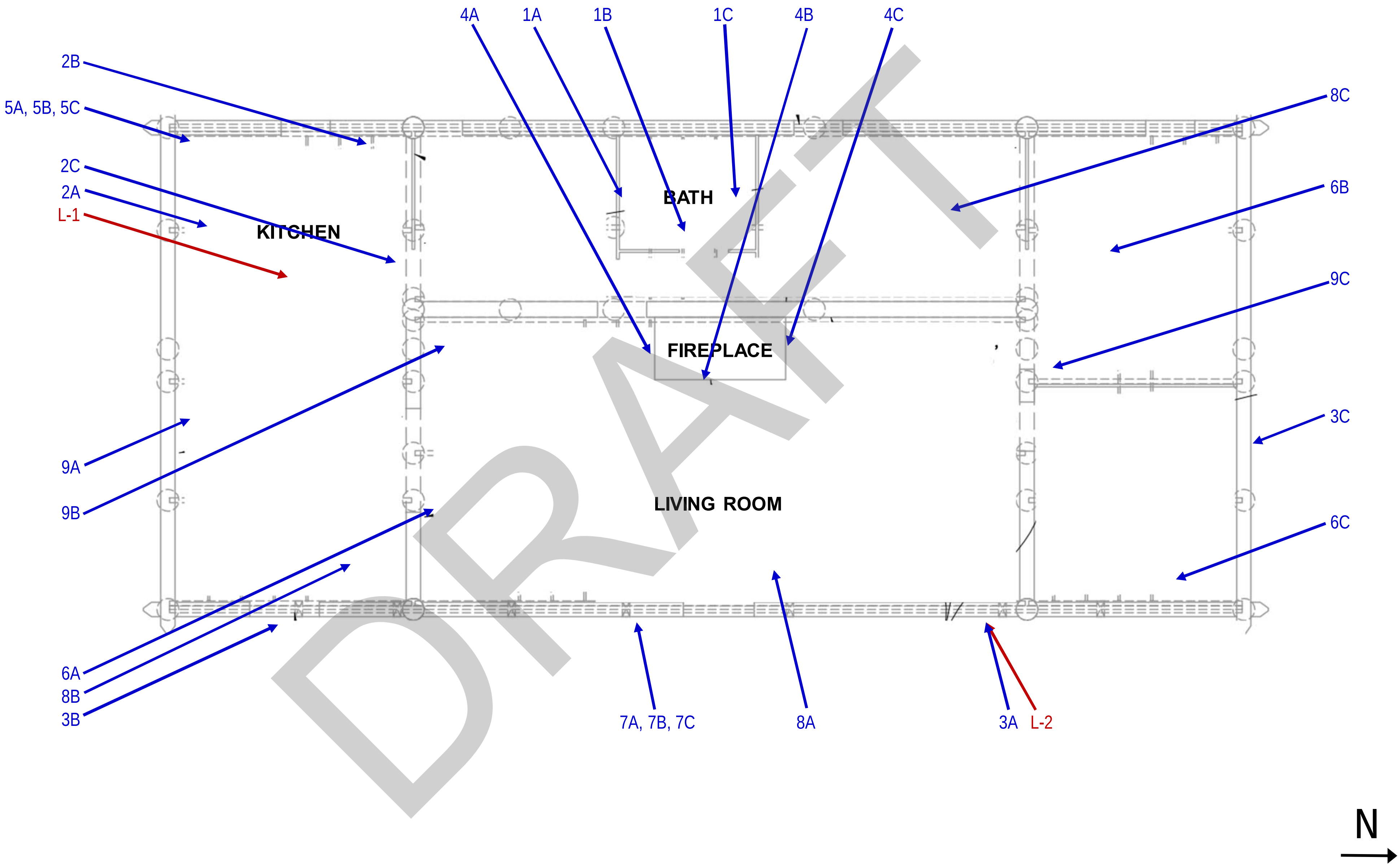
SAMPLE LOCATION DRAWINGS

Attachment 1



Terracon	Beatty House La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2

Attachment 1



Terracon	Redwood Log Cabin La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2

Attachment 1

Sample L-3 white paint on wood siding collected from exterior of barn

Samples 100A, 100B, and 100C Black 1/8" wiring collected from interior of barn

Terracon	White Barn	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 3

EXHIBIT E

Structural Surveys for Special-Status Mammal Species

by Swaim Biological, Incorporated

Swaim Biological, Incorporated
4435 First Street PMB #312
Livermore, CA 94551

TO	Matthew Chaney, Midpeninsula Regional Open Space District 330 Distel Circle Los Altos, Ca 94022
FROM	Karen Swaim and Ryan Byrnes, Swaim Biological Incorporated 4435 First Street Livermore, CA 94551
DATE	June 30, 2019
SUBJECT	La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands and Rancho San Antonio Preserve – Structural Surveys for Special-Status Mammal Species

1. INTRODUCTION AND BACKGROUND

Per Midpeninsula Regional Open Space District's (District) request, Swaim Biological Incorporated (SBI) has conducted habitat and occupancy surveys for special status mammal species at the La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands (Guisti Property) and Rancho San Antonio Preserve in June 2019. Surveys evaluated structures and the surrounding areas in preparation for structure stabilization and demolition projects. SBI's qualified biologists surveyed for San Francisco dusky-footed woodrats (*Neotoma fuscipes annectens*) and roosting bats at nine (9) structures, twelve (12) storage tanks and multiple debris piles at six (6) separate locations. This report details the methods and provides a summary of our survey results and recommendations. A follow-up bat emergence survey was conducted at the Sierra Azul Preserve - Beatty Property by District Biologist Matthew Chaney on July 30, 2019.

2. METHODS

Special Status Bat Surveys

Surveys for bats are difficult to standardize because of the large amount of variability that exists at individual survey sites and among survey sites in a project area, much less across the range of a species. Nevertheless, several practices were used to survey for bats, including; bat habitat assessments, daytime maternity roost and signs of bats use surveys (i.e., guano pellets and urine staining), emergence surveys, and acoustic surveys.

SBI biologists conducted a daytime bat survey at each location to determine if the structures, storage tanks, and associated debris piles are currently in use by bats. During the surveys, the biologists inspected habitat

features on the exterior of each structure and searched for bats or signs of bat occupancy including maternity roosts, day roosting bats, guano pellets and urine staining. Coordinates and photographs were taken of each roost identified.

The bat emergence and acoustic surveys began one-half hour before sunset and continued until at least one hour after sunset or until it was otherwise too dark to see emerging bats. Surveyors positioned themselves so that emerging bats would be silhouetted against the sky as they exited the roost. Surveyors were close enough to the roost to observe all exiting bats, but not close enough to influence emergence. Acoustic detectors were deployed in conjunction with emergence survey efforts to monitor bat activity within the proposed project area. Bat vocalization calls were recorded with SonoBatLIVE (using the Petterson M500 USB mic), Anabat Swift, and Pettersson D500 (bat acoustical detectors). Bat vocalization files were analyzed and vetted through SonoBat 4.4 using the SonoVet utility (bat call analysis software) by qualified biologists.

In locations where suitable bat habitat was observed but no bats or signs of bats were observed, absence is not presumed. Bats may switch roosts on a nightly basis and the surveys conducted are not interpreted as presence/absence surveys.

Bat occupancy was determined as a potential maternity colony whenever an aggregate of bats were observed roosting or emerging at a specific structure. Classification as a maternity colony is a conservative/cautious estimate for aggregates of bats and is therefore not discriminating between non-reproductive male or female roosts. A single bat could be a "maternity colony" (i.e. One adult bat with a pup) and even small maternity roosts could represent a large portion of the local bat population and are therefore "significant". Bats (including females with pups) may switch roosts on a nightly basis and therefore might use suitable habitat, if present, though not observed during the surveys. Therefore, we classified and reported aggregates of bats observed as maternity colonies during the summer/maternity season.

San Francisco Dusky-footed Woodrat Surveys

SBI qualified biologists also conducted detailed surveys for woodrats by searching the interior and exterior of all structures, storage tanks (exterior only), and associated debris piles for signs of woodrat occupancy (nests and droppings) within 50-foot of the project area. SBI flagged and photographed any nests that were encountered. Coordinates of each nest was recorded along with a description of the nest.

3. SURVEY RESULTS

Survey results for each survey location are provided below. Site specific recommendations are provided at the end of each location section. Descriptions of recommendations for all sites are compiled at the end of the report.

3.1 LA HONDA CREEK PRESERVE – WHITE BARN (DYER BARN)

SUMMARY

The survey for White Barn on Allen Road, Woodside, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures (Photo 1-2). Three roosting bats were detected during the daytime survey. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn surveyed receives partial shade from the riparian corridor to the west (Photo 3). Surrounding the barn is signs of wetland / wet meadow as demonstrated by the presence of (giant plantago (*Plantago major*), sedges (*Scirpus spp.*), elderberry (*Sambucus nigra spp. Caerulea.*), and willows (*Salix sp*). A concrete drainage adjacent to the east side of the barn appears to drain overland flow into the adjacent drainage (Photo 4). The barn itself is in a flat that leads to a downstream ravine and riparian corridor. The interior of the barn (Photo 5 and 6) is comprised of one area subdivided into sections by feeding stalls, an interior enclosed chicken coop, and an open space area. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 7).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the floor, roof and the walls of the barn. The gaps as well as multiple missing wood slats allow bats to easily enter the building and roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof. Moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat, no other structures or outbuildings were observed in the immediate area to provide additional maternity roost habitat. Suitable bat foraging habitat is found throughout the White Barn survey area.

Bat guano was observed in the interior of the structure on the floor along the north wall (Photo 8). Three *Myotis sp.* (Photo 9 and 10) were observed day roosting in these rafters on the north side of the barn. Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat.

Rodent sign is present throughout the structure with multiple large grass nests (Photo 11) and a significant number of rodent droppings observed (Photo 12). While the biologists were within the chicken coop, they heard a rodent scurrying directly overhead. No woodrat nests were observed on the premises or within the 50-foot buffer. There was a woodrat squeaking repeatedly in the nearby riparian corridor although no middens were observed where the noise was coming from.

DISCUSSION AND RECOMMENDATIONS

Suitable bat roost habitat is present within the structure and moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat. Based on the observed presence of at least three bats roosting within the structure this site is presumed to be serving as a maternity roost.

No signs of woodrats were present in the structure or surrounding natural habitat. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

Recommendations for the White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- The need for replacement habitat due to impacts on the maternity roost per District guidelines is dependent upon whether the planned stabilization activities will eliminate roosting habitat. Determination of the need for replacement habitat plan should coincide with the development of the deterrent plan.

Photo 1. White Barn exterior.

Photo 2. White Barn exterior.

Photo 3. White Barn exterior missing wooden slats and entry points for bats.

Photo 4. Concrete drainage to the east of White Barn that feeds into the riparian corridor.

Photo 5. Interior of White Barn.

Photo 6. Interior of White Barn.

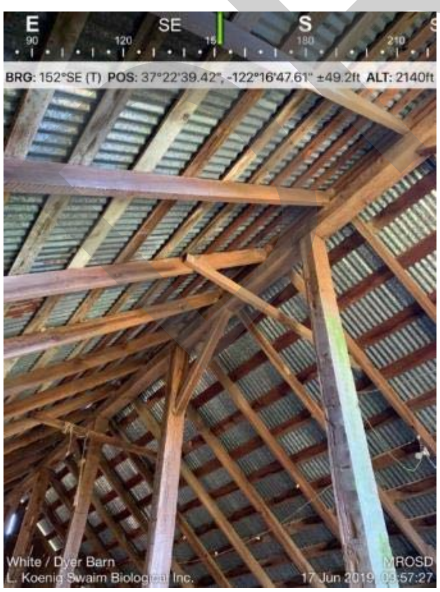


Photo 7. Corrugated roof slats and rafters provide suitable bat roosting habitat.

Photo 8. Bat guano present on the floor.

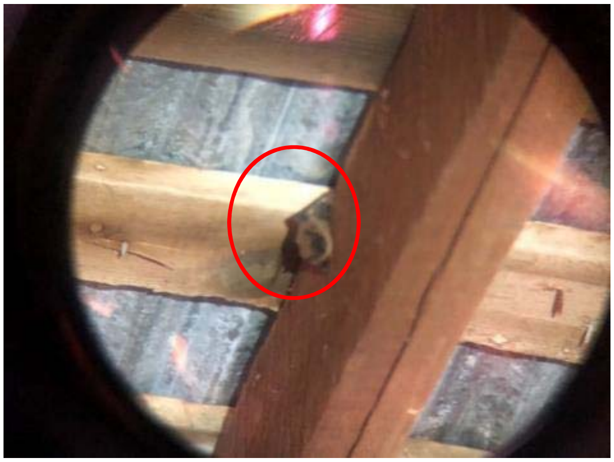


Photo 9. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 10. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 11. Rodent nests observed within the barn. These grass nests are most likely deer mouse (*Peromyscus sp.)* nests.

Photo 12. Rodent droppings and destroyed food caches observed within the barn.

3.2 LA HONDA CREEK PRESERVE – REDWOOD CABIN

SUMMARY

An external survey for Redwood Cabin on Skyline Boulevard, Redwood City, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. An internal and emergence survey was completed on June 26, 2019 by biologists Rachael Burnham and Leslie Rivas. No signs of roosting bats were detected during the internal and external survey of existing structures within. Four dusky-footed woodrat nest structures were observed inside the structure. No bats were observed emerging from the Redwood Cabin during the emergence survey. Acoustic recordings identified fringed myotis (*Myotis thysanodes)* foraging calls in the vicinity.

STRUCTURE

The Redwood Cabin is a one-story structure situated in a redwood forest and is well shaded with only dappled light coming through to the cabin and forest floor (Photo 13 and 14). The log cabin has several rooms, including a kitchen and two bathrooms. On the east side, the deck and portion of the house are supported off the ground by pillars and other support structure.

RESULTS

There are several possible entryways that bats and woodrats could enter the house: open/broken window, chimney, and crevices in the floor and roof. The ample space underneath the house had numerous crevices that could be used by roosting bats. There were also many cracks and crevices that could provide bat roosting habitat under the eaves, between the logs, and inside the cabin. However, no roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed during the survey. In general, moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. Bat tree roost crevice and cavity roost habitat can be found through the Redwood Cabin work area.

Signs of woodrats were present throughout the cabin including a large number of fecal pellets in all rooms of the cabin. One woodrat nest structure was built into a cabinet in the kitchen (Photo 15), twigs around and behind the oven, twigs on ceiling beams in between rooms (Photo 16), and two nest structures built on top of sinks in two rooms (possibly connected behind the wall) (Photo 17 – 18).

EMERGENCE RESULTS

The bat emergence survey at the Redwood Cabin was conducted one hour before sunset and continued until one-half hour after sunset. No bats were observed emerging from the structure. The acoustic recording device set up in front of the cabin identified one species of bats: fringed myotis. During the emergence survey, no bats were detected emerging from the cabin.

DISCUSSION AND RECOMMENDATIONS

The cabin provides suitable bat roost habitat outside and within the cabin with multiple entry points. Moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. While no bats or signs were observed within or outside the cabin during day surveys and no bats were observed emerging during night surveys, a single bat (fringed myotis) was detected with acoustics within proximity of the cabin. Therefore, there is still potential of bat roosting given the available habitat outside and within the cabin. However, this structure receives little light throughout the day and the building is unlikely to warm up sufficiently enough to support a bat maternity roost.

Signs of woodrats were present throughout the structure, however no natural nests were observed outside of the structure. The riparian habitat near the structure provides moderately to highly suitable habitat and may become occupied by woodrats prior to project work.

Recommendations for the Redwood Cabin include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 13. North side of Redwood cabin.

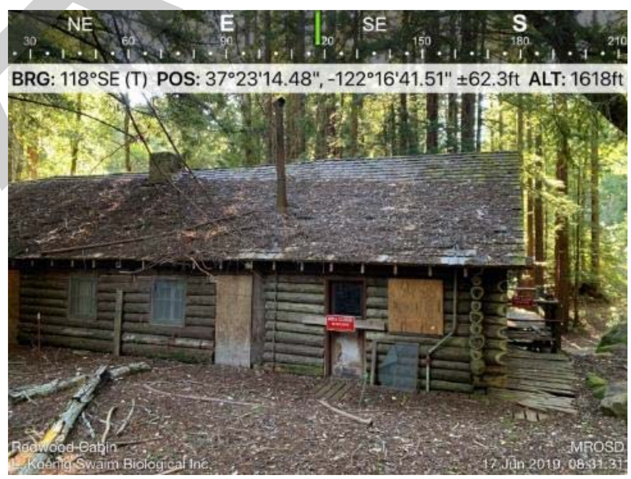


Photo 14. Redwood cabin.

Photo 15. Woodrat nest built into kitchen cabinet of redwood cabin.

Photo 16. Woodrat nest on ceiling beams of redwood cabin.

Photo 17. Woodrat nest on sink in Room A of redwood cabin.

Photo 18. Woodrat nest on sink in a Room B of redwood cabin.

3.3 SIERRA AZUL PRESERVE- MEYER PROPERTY

SUMMARY

An external survey for Meyer Property on Mount Umunhum Road, San Jose, California was conducted on June 11, 2019 by biologists Ben Dudek and Joie de Leon. An internal and emergence survey was completed on June 25, 2019 by biologists Elizabeth Armistead, Ben Dudek, Kathleen Grady, and Leslie Rivas. The biologists conducted a daytime survey at all three structures (labeled A, B, and C) for bat roosts and woodrat nest structures, and a nighttime bat emergence survey. No roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed inside any of the three structures. One *Myotis Sp.* (Photo 27) was observed in a crevice in a nearby shed on June 11th but not on June 25th. Two dusky-footed woodrat nest structures were observed in oak trees Structure A. Two bats were observed emerging from two exit points during the emergence survey from Structure B. Acoustic recordings identified two species of bats foraging within the vicinity: California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*).

STRUCTURES

Structure A is a two-level house that is set to be demolished (Photo 19 and 20). Structure A is well shaded on the north and west sides of the house by oak trees and is unshaded on the east and south sides of the house. Structure B is the one-level studio apartment that will not be demolished (Photo 25). The structure is mostly unshaded with a flat-topped roof. There is a garage with an open-air shed space attached. Structure C is a shed that will also remain and not be demolished (Photo 26). In general, moderately – highly suitable bat maternity habitat is found adjacent to the structures listed above and within the structures scheduled to remain.

Figure 1. Meyer Property Structures

RESULTS

Structure A: The ceiling of Structure A is accessible to bats through a few entry points under the roof eves and the interior is accessible through the chimney (Photo 21). The interior of the house is comprised of a lower level with six sections (kitchen, dining room, laundry room, living room, bedroom, bathroom, and a crawl space) and an upper level with two sections (hallway and bedroom). No visible sign of bat occupancy was observed inside the house. Some nearby oaks had hollows that could provide moderately to highly suitable bat maternity habitat, including a tree with full sun exposure with 20% exfoliating bark.

Two woodrat nests were located approximately 25-feet from Structure A in the hollowed-out trunks of two large coast live oaks (*Quercus agrifolia*) (Photo 22). A black phoebe (*Sayornis nigricans*) nest was observed under the eve of Structure A.

Structure B: A seam running under the roof eaves of Structure B was observed that could provide suitable bat roosting habitat although no roosting bats or signs of roosting bats were observed (Photo 23). Inside Structure B large quantities of woodrat fecal pellets were observed scattered throughout the shed.

Structure C: The open structure has suitable bat maternity and night roosting habitat within (Photo 24). A potential woodrat midden is located outside of the shed on an upper shelf (Photo 25).

Shed: There is a shed to the west of the structures that were to be surveyed where a day roosting *Myotis* sp. was observed on June 11 (Photo 26). No roosting bats were observed on June 25.

EMERGENCE RESULTS

The bat emergence surveys at Structure A and B were conducted one-half hour before sunset and continued until one and a half hours after sunset. No bats were observed emerging from Structure A. However, bats were observed foraging in the oaks about 25-feet north of Structure A. At Structure B, the biologists observed two bats emerge from two points (Table 1) and fly west towards the coast live oak trees. Acoustic surveys positioned over the open space south of Structure B confirmed the presence of California myotis and big brown bat foraging in the vicinity.

Table 1. Bat Emergence Results at Sierra Azul – Meyer Property (Structure B)

Time	No. of Bats Emerging	Location	Latitude	Longitude
2048	1	Structure B - northwest	37° 10' 2.46" N	121° 52' 9.22" W
2053	1	Structure B - southwest	37° 10' 2.24" N	121° 52' 8.87" W

Table 2. Woodrat nest locations – Meyer Property

Location	Latitude	Longitude	Flagging Color
Oak tree near Structure A	37.1670993	-121.8695911	Pink
Oak tree near Structure A	37.1670114	-121.8696032	Pink
Structure C	37.1670462	-121.8690466	Not flagged

DISCUSSION AND RECOMMENDATIONS

Since these some structures are scheduled for removal and others only stabilization (as described above), we present recommendations for each specific structure. All structures are potentially suitable bat day and night roost habitat. Bats were observed foraging in the in the oaks near these structures which serve as moderately to highly suitable maternity roost habitat nearby.

Structure A: The structure provides potential bat entry points to the structure through ventilation holes in the roof eaves and the chimney. The structure provides suitable roosting habitat under the roof eaves and within the structure if access was obtained through any of the current entry points. While no bats or signs were observed within or outside of the structure during day surveys and no bats were observed emerging from the structure during night surveys, absence cannot be assumed.

Two natural woodrat nests were observed outside of the structure in two large coast live oaks although they are likely outside of the disturbance area for demolition activities.

Recommendations for the Meyer Property Structure A include:

- Preconstruction surveys for bats and woodrats prior to demolition activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities.
- General woodrat avoidance measures presented in Section 4.2.

Structure B: The roof eaves of the structure provide suitable bat roosting habitat. While no bats or signs were observed within or outside of the structure during day surveys, two bats were observed emerging from the structure during the night survey. Based on the observed presence of more than one bat emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed within the structure although no natural nests were observed.

Recommendations for the Meyer Property Structure B include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for any habitat removed or disturbed within all structures at the Meyer Property. No additional replacement habitat is recommended unless required by CDFW.

Structure C: While no bats or signs were observed within the shed during day surveys, though potentially suitable bat day and night roost habitat is present.

Signs of woodrats were present in the structure, however no natural nests were observed outside in the vicinity.

Recommendations for the Meyer Property Structure C include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 19. Structure A is partially shaded by oak trees.

Photo 20. Structure A

Photo 21. Ventilation holes under the eve of Structure A.

Photo 22. Woodrat middens in hollows of oak trees west of Structure A.

Photo 23. Structure B – north-side view.

Photo 24. Structure C – shed west of Structure A.

Photo 25. Possible woodrat midden on shelf in Structure C.

Photo 26. *Myotis sp.* (circled in red) observed roosting in crevice in nearby shed to the west of the structure to be removed.

3.4 SIERRA AZUL PRESERVE – BEATTY PROPERTY

SUMMARY

An external survey for Beatty Property off Alma Bridge Road, Los Gatos, California was conducted on June 19, 2019 by Hailey Pexton and Ben Dudek. An internal and emergence survey was completed on June 28, 2019 by biologists Elizabeth Armistead, Rachael Burnham, and Leslie Rivas. The biologists conducted a daytime survey for bat roosts and woodrat nest structures and a night emergence survey. No bats were observed on the June 19 survey. On June 28 six roosting *Myotis sp.* bats were detected during the daytime survey and eight bats were observed emerging from four exit points during the emergence survey. On July 30, District staff completed follow up emergence surveys and observed 11 bats emerging from the structure. Habitat surrounding the structure is highly suitable for maternity bat roost and foraging habitat. Three dusky-footed woodrat nest structures were observed within 50 feet of the existing structure with large amounts of woodrat sign (e.g., fecal pellets) observed throughout the entire house.

STRUCTURE

The structure is a one-story house with crawl space and is situated in oak woodland with nearby grassland and Lexington Reservoir within 500 feet of the property (Photo 27). There was a total of nine rooms in the house, including a kitchen, laundry room, and bathroom. The house is shaded on the north, east, and south sides and has full sun exposure on the west side.

RESULTS

Biologists fully surveyed around the exterior of the house and found multiple potential bat and woodrat entry and exit points on all sides of the house (Photo 27 and 28). Several large oaks surrounding the structure could support roosting bat habitat; two snags on the west side with 5 – 10% exfoliating bark with full sun exposure, one snag of the east side with 5% exfoliating bark with full sun exposure (Photo 29). The house is in disrepair with many decaying eaves around the roofline that bats could be obtaining access through. There is space between many of the boarded-up windows and doors, and some wooden slats of the house are broken that could also provide bat entry points (Photos 30 – 35). There are various holes and broken wooden slats along the bottom of the house that could provide bat or woodrat entry.

There are large amounts of bat signs (e.g., urine staining and guano) on the walls of the interior of the house and all rooms showed signs of bat use (Photo 36). Six bats (*Myotis* sp.) were observed in various places throughout the house.

Upon entry to the house, large amounts of woodrat sign (e.g., fecal pellets) were observed throughout the entire house (Photo 37 and 38). Lots of debris on the floor of the house and two stick piles observed, one on top of the stove in the kitchen and one on top of the sink in the bathroom (Photos 37 - 42). No substantial woodrat nests were observed inside the structure, but there are numerous woodrat access points to the crawl space and area between ceiling and roof that were not surveyed. Three woodrat nests were observed within the 50 feet of the Beatty house structure (Photos 39 – 41).

EMERGENCE RESULTS

The bat emergence survey was conducted one-half hour before sunset and continued until one half hour after sunset. Eight bats were observed exiting the structure (Table 3) at four locations (Photo 34 and 35).

Table 3. Bat Emergence at Sierra Azul – Beatty Property

Time	No. of Bats Emerging	Location	Latitude	Longitude
2032	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2038	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2046	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2047	2	west	37° 11' 26.91" N	121° 59' 8.55" W
2048	1	south	37° 11' 26.84" N	121° 59' 8.45" W

Table 4. Woodrat nest locations Beatty Property

Location (see photos 39-41)	Latitude	Longitude	Flagging Color
South of house – woodrat number 1	37.1906508	-121.9856141	Pink
Down hillside from house – woodrat number 2	37.1909208	-121.9857824	Pink
In tree adjacent to house – woodrat number 3	37.1909558	-121.9858746	Pink

DISCUSSION AND RECOMMENDATIONS

The Beatty Property provides highly suitable bat roosting habitat. Based on the observed presence of bat signs throughout the structure, observed bats roosting within, and bats emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed throughout the structure and natural nests observed outside.

Recommendations for the Beatty Property include:

- Preconstruction surveys for bats and woodrats prior to removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 27. Beatty property.

Photo 28. The housing structure is located beneath a canopy of coast live oaks (photo facing west).

Photo 29. Two snags that could support roosting bats on west side of Beatty structure.

Photo 32. Hole on wall that could provide bat access.

Photo 33. Wooden slats peeling away from the wall.

Photo 34. Bats observed emerging from hole in wall (circled in red) on east side of the house.

Photo 35. Bats observed emerging from wooden slats (circled in red) on west side of the house.

Photo 36. Bat urine staining and guano on wall; *Myotis sp.* (circled in red) observed roosting.

Photo 37. Stick pile on top of stove in kitchen.

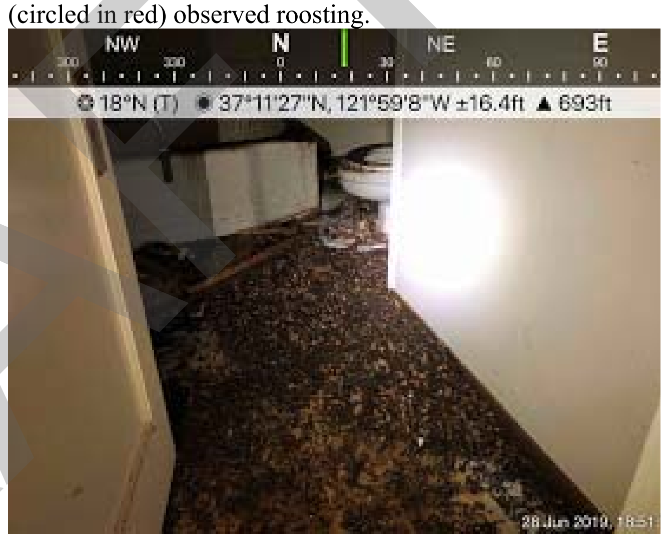


Photo 38. Large amount of woodrat feces on floor.

Photo 39. Woodrat nest number 1 is located under an ornamental bush 9 meters south of the structure

.

Photo 40. Woodrat nest number 2 is located along a fence 10 meters northeast of the structure.


Photo 41. Woodrat nest number 3 is located in a tree, northwest of the structure.


Photo 42. Woodrat A large amount of woodrat feces was observed in one location along the exterior of the structure.

3.5 PURISIMA UPLANDS

SUMMARY

A survey for Purisima Uplands in San Mateo County, California was conducted on June 27, 2019 by biologists Victoria Brunal, Rachael Burnham, Ryan Byrnes, and Ben Dudek. The biologists conducted a daytime survey at all locations for bat roosts and woodrat nest structures, and a nighttime bat emergence survey at Areas B and E. No sign of roosting bats was detected during the daytime survey of existing structures. Fourteen dusky-footed woodrat nest structures were observed inside or near existing structures. Three bats were observed emerging from the roofline of the hunting cabin in Area E during the emergence survey. Acoustic recordings at Area E identified these three individual bats as two species: California myotis and Mexican free-tailed bat (*Tadarida brasiliensis*). No bats were observed during the emergence survey at Area B.

RESULTS

AREA A: The structure at Area A is a small, open, un-shaded shed with a corrugated tin roof. No sign of bats (e.g., guano pellets and urine staining) was observed on the inside of the structure. The exposure of the shed, and lack of small crevices inside the structure may make this building sub-optimal for day roosting bats. Dusky-footed woodrat sign (e.g., pellets) were observed inside the shed. Additionally, five woodrat nest structures were observed throughout the site, including a nest underneath Tank 13 and a second nest in a pipe leading away from the tank.

AREA B: The inside of Tanks 1-2 could not be observed due to their height, but both tanks appeared to be single-walled and open on the top. These tanks are likely unsuitable for day roosting bats due to exposure to the elements and the lack of additional surfaces that could create crevices. The distillation column was capped on the top but appeared to have a small opening on its side about 15 feet off the ground that could potentially be used by roosting bats (Photo 43). The structure on the east side of Area B included a series of iron grates over a concrete box filled with water as well as a dilapidated shed with a corrugated tin roof. The shed contained pieces of wood attached to corrugated tin that created small crevices that could be suitable for bats, but no signs of bats were observed. Large woodrat nest structures were observed inside the series of iron gates and inside the dilapidated shed, as well as behind the shed (Photo 44 and 45).

AREA C: Tanks 3-6 appeared sealed and therefore unlikely to support any bat roosting habitat. The roof on Tank 7 is in the process of falling off the structure. Where the ceiling hung over the tank, there was a small area where bats could find shelter, but no sign of bats was observed. One woodrat nest was observed near Tank 3, and another nest was observed near Tank 6.

AREA D: Tanks 8-12, the area around the concrete pylons, and the various debris piles all were searched. The tanks all appeared to be single-walled without any additional surfaces to create crevices suitable for day-roosting bats. Open tops, or open sides in the cases of tanks lying on their sides, created exposure to

the elements that may preclude these structures from being used by bats (Photo 46). A large woodrat nest was observed inside Tank 11, and two smaller satellite nests were observed surrounding the tank.

AREA E: The exterior of the hunting cabin had rotted and loose wood paneling, especially near the roofline, that could be suitable for roosting bats (Photo 47 and 48). A search of the structure's exterior found no sign of bats, however, many holes and crevices that led to the space between the roof and the structure's interior could not be fully observed. A search of the interior of the structure revealed that the previous owners had used the cabin recently. Maternity colony day-roosting habitat was observed inside the structure and no guano pellets or urine staining were observed. Additionally, no sign of woodrats were observed inside the cabin, however small mammals droppings (likely *Peromyscus* sp.) were present throughout the cabin. One large woodrat nest structure was observed behind the cabin.

EMERGENCE RESULTS

The bat emergence surveys at Areas B and E were conducted one-half hour before sunset and continued until one and half hours after sunset. At Area B, the biologists observed the dilapidated building and an opening on the distillation column. No bats were observed emerging from the small opening on the distillation column, or from the dilapidated structure on the east side of Area B. Additionally no bats were observed flying over the habitat. At Area E, the biologist observed the roofline along the front of the hunting cabin. Three bats were observed emerging from the front of the hunting cabin near the roofline. As the bats were seen flying from the cabin, the acoustic recording device set up in front of the cabin identified two species of bats: California myotis and Mexican free-tailed bat. After emergence, bats were observed flying over the habitat and continued to be recorded by the recording device.

Table 5. Woodrat nest locations Purisma Uplands

Location	Latitude	Longitude	Flagging Color
Area A – woodrat nest 1 wooden shed	37.401899	-122.410356	Pink
Area A – woodrat nest 2 near T13	37.401916	-122.410164	Pink
Area A – woodrat nest 3 near T13	37.401961	-122.410085	Pink
Area A – woodrat nest 4 near T13	37.402006	-122.410073	Pink
Area A – woodrat nest 5 near T13	37.402015	-122.409983	Pink
Area D – woodrat nest 6 near T11	37.402713	-122.409107	Pink
Area D – woodrat nest 7 near T11	37.402723	-122.409152	Pink
Area D – woodrat nest 8 near T11	37.402731	-122.409062	Pink
Area C – woodrat nest 9 near T6	37.402968	-122.407817	Pink
Area C – woodrat nest 10 near T3	37.403112	-122.407635	Pink
Area B – woodrat nest 11 near Storage Shed	37.403192	-122.407431	Pink
Area B – woodrat nest 12 near Storage Shed	37.403155	-122.407364	Pink
Area B – woodrat nest 13 near Storage Shed	37.403191	-122.407363	Pink
Hunting Cabin – woodrat nest 14	37.406049	-122.403736	Pink

DISCUSSION AND RECOMMENDATIONS

None of the tanks to be removed provide suitable bat roost habitat. The structure in Area A provides sub-optimal day roosting habitat and the shed in Area B provides suitable bat roosting habitat in the form of crevices although no bats or signs of bats were observed at either structure. No bats or signs of bats were observed during inspections of the interior of the Hunting Cabin in Area E, however, three bats were observed emerging during night surveys. Based on the observation of bats emerging from the Hunting Cabin this site is presumed to be serving as a maternity roost.

Woodrat signs and nests were observed throughout the property in structures, debris piles and natural nests.

Recommendations for the Purisima Property include:

- Preconstruction surveys for bats and woodrats prior to demolition and debris removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities at the Area E Hunting Cabin.
- Provide replacement bat maternity roost habitat for impacts to removal of maternity roost habitat at Area E Hunting Cabin as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for all bat roost habitat removed or disturbed during removal activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 43. Area B – the distillation column was sealed on top but appeared to have a small opening on the left-hand side near the valve connection.

Photo 44. Area B – woodrat nest structure inside the series of iron grates. This structure sits over a concrete spring box filled with water.

Photo 45. Area B – woodrat nest structure inside the dilapidated building.

Photo 46. Area D – most tanks were single-walled without any small crevice space for roosting bats.

Photo 47. Area E – additional openings and interstitial spaces underneath the roofline.

Photo 48. Area E – openings underneath the roofline of the hunting cabin.

3.6 RANCHO SAN ANTONIO PRESERVE- DEER HOLLOW FARM WHITE BARN

SUMMARY

The survey for White Barn at Deer Hollow Farm in Cupertino, California was conducted on June 18, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures. Though the barn provides potentially suitable bat day and night roost habitat, no roosting bats were observed. Signs (bat guano) of bat roosting were observed in the upper level of the barn. In general, highly suitable bat maternity roost habitat and foraging habitat was observed throughout the site in the form of bat tree roosts and man-made structures. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn that was surveyed is one of many structures in Deer Hollow Farm that is an active educational farm. The lower level of the barn is actively used as a goat milk barn, storage location, and hay barn (Photos 49 and 50). The upper level / former hayloft of the barn is less stable although it too is actively used for storage. The barn receives partial shade from the riparian corridor to the north and a large valley oak to the south. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 51 and 52).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the roof and hayloft doors which are left open. The openings allow for bats to easily enter the building and roost although the openness may reduce the ability for the barn to be used as a maternity roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof.

Bat guano was observed in the interior of the structure on the floor throughout the hayloft (Photo 53). Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat and the adjacent riparian area has plentiful tree roost habitat available.

Rodent sign is present throughout the structure with rodent droppings observed (Photo 54). No woodrat nests were observed on the premises or within the 50-foot buffer. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

DISCUSSION AND RECOMMENDATIONS

While no day roosting bats were observed during the surveys, signs of bats presence (guano) was observed. The site serves a potentially suitable day and night roosting habitat with adjacent suitable bat foraging and tree roost habitat.

No signs of woodrats were present in the structure or surrounding habitat. The active farm nearby likely limits the potential of woodrats to occur within a construction footprint for the barn, however, the nearby riparian habitat provides suitable habitat and therefore woodrat absence should not be assumed.

Recommendations for the Deer Hollow White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 49. White Barn exterior showing hayloft doors and open access points.

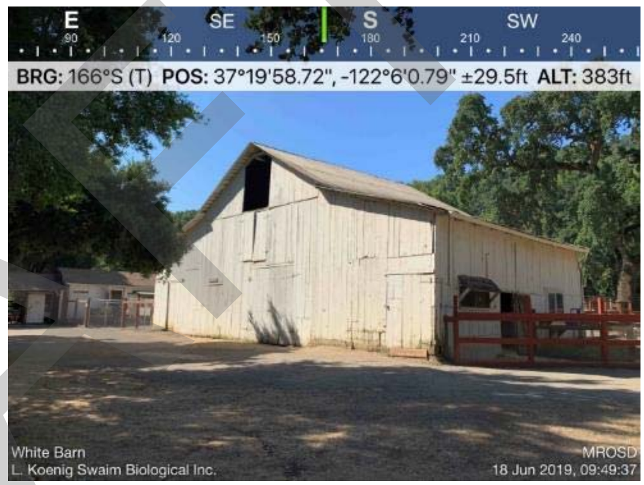


Photo 50. White Barn exterior showing hayloft doors and open access points.

Photo 51. White Barn hayloft with crevice roost habitat between roof and rafters.

Photo 52. Interior of hayloft with wooden slat openings

Photo 53. Bat guano on floorboards.

Photo 54. Lower level with hay storage and milk barn

4. RECOMMENDATIONS

Based on the results of these surveys, bats and woodrats are currently using multiple locations within and adjacent to the structures surveyed.

4.1 BATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. At some of these locations suitable bat habitat was observed but no bats were observed during the daytime roost surveys or during emergence. However, bats may switch roosts on a nightly basis, therefore, there is still potential of bats roosting within these structures where suitable habitat is observed. A demolition and deterrent plan for each location that identifies locations for deterrence and what mitigation measures (i.e., replacement habitat) are warranted prior to structure demolition and/or stabilization should be completed as recommended above for each survey location.

The following measures and recommendations for bat deterrence and demolition will be included in the exclusion/deterrent plan. Recommendations should be implemented on a site by site, case by case basis. Not all recommendations are appropriate for all locations, see the Discussion and Recommendations section for each survey location above for reference.

<u>General bat avoidance and minimization measures</u>

- Within two days of the start of work, at all project locations, preconstruction bat roost surveys should be conducted.
- If work is anticipated to occur during the bat wintering period (generally from November 16 through February 15) preconstruction winter roost surveys should be conducted. No building or tree work (over 16” dbh) should be conducted during this time if surveys determine that special status bats or hibernacula are present during winter roost surveys.
- If individual nonbreeding and non-special status bats are present, a qualified biologist may be retained to remove the bats and work may proceed year-round at La Honda Creek Preserve – Redwood Cabin, Sierra Azul Preserve – Meyer Property structures, and the Rancho San Antonio Preserve site. If a maternity roost or special status species bat is observed, no work is allowed without first excluding and providing alternate roost site(s) outside of the breeding season.
- Demolition should be conducted during warmer weather when nighttime lows are not below 50° Fahrenheit, and most bats are likely to be active.
- Recommend that crevices first be demolished with hand tools.
- Initiate demolition in the early evening after sunset with a bat biologist present to capture and temporarily hold any bats that are uncovered.
- If evening work is not feasible, initiate demolition in the early afternoon with a qualified bat biologist present. Early afternoon work will ensure that any remaining roosting bats are not in torpor, as torpid bats may not immediately arouse and escape with disturbance. If any bats are

uncovered, they should be temporarily held and released in the evening.

Bat roost deterrent/exclusion plan

At survey locations with potentially suitable bat roost habitat observed, a site-specific bat roost deterrent plan for is recommended. The following measures below should be considered but may not be applicable to all sites. Alternative roost deterrents may be implemented if approved by qualified biologist. The site-specific deterrent plan shall be submitted to CDFW for approval.

- Deterrents shall be placed outside of April through August maternity season.
- At least seven (7) days before the properties are demolished and/or stabilized, open all windows and doors to increase airflow.
- Deploy ultrasonic acoustic deterrents inside the structures and/or near areas where bats may roost. No acoustic deterrents shall be places next to roosting bats, if bats are observed, deterrents will be placed once bats have left the site.
- Deploy/Install one-way bat doors at locations where bats are observed entering and exiting structures. One-way bat doors and exclusion of bats from the building should occur outside of the April through August maternity season.

Replacement maternity roost habitat

At survey locations with identified maternity roosts, no building demolition or tree work (over 16" dbh) should be conducted April 15 – August 31. Where structures with identified maternity roost habitat will be eliminated, replacement habitat is recommended. CDFW may not require mitigation for these locations, therefore, CDFW should be contacted for guidance for each specific location.

- If CDFW requires replacement habitat, no work should occur without first excluding and providing natural or manmade alternate roost site(s) outside of the breeding season.
- Alternate roost site(s) should be developed by District Natural Resources staff or a consulting biologist and submitted to CDFW before installation.
- Whenever possible alternative roost site(s) should be provided 6 months to 1 year prior to the removal of maternity roosting habitat to allow bats adequate time to discover the new locations.
- Artificial alternative roost site(s) shall be monitored for occupancy by a qualified biologist within one year of installation.

4.2 WOODRATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. A preconstruction survey is warranted at all locations as woodrat houses may become occupied or unoccupied, and new nests constructed prior to project work.

General woodrat avoidance measures

- Conduct focused follow up surveys are at all structures at least five days before construction to confirm the presence of woodrat houses and develop a deterrence/relocation plan if necessary.
- For all woodrat nests that occur in natural habitats (i.e. not within any structure footprint) and cannot be avoided by project activities, a qualified biologist shall live trap to determine if the nest is in use. Trapping activities should occur prior to April and after mid-July each year to prevent impacts to woodrats rearing young or young woodrats. If a nest is found to be unoccupied or not in use for 3 full days (2 nights of trapping), then it may be removed. The nest shall be relocated, or a pile of replacement sticks shall be placed outside of the development footprint for future colonization or re-use.
- In some District locations, woodrats have colonized abandoned buildings, old vehicles, diffuse garbage piles, or other locations where nests are difficult to locate, individuals cannot be live-trapped consistently, and/or there is a lack of woody materials for nest reconstruction. In these instances, live trapping is not required (especially if there is a risk to human health) if the surrounding area provides suitable habitat or supports a healthy colony that is being avoided and/or can be enhanced. Work at these locations must occur prior to April and after mid-July to prevent impacts to woodrats rearing young.
- Once trapped, nests shall be torn down and rebuilt surrounding a log-based structure, an inverted wooden planter, or similar structure having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any cached food and nest material encountered shall be placed within the new structure during rebuilding.
- If individual rats are present, they will be encouraged to leave the area on their own which may include demolition or cleanup in phases, and/or hand removal of materials. If individual woodrats are observed during implementation, work in the immediate area shall cease until the animal leaves the area on its own. Work may continue at other locations away from the observation location. If the animal does not leave the area on its own, the project biologist or a biological monitor shall be notified. Work may proceed at the observation site, once the animal has left the area on its own or a biological monitor is present to ensure that the individual woodrats are not harmed.
- If nests are present that cannot be trapped or removed, woody debris piles that look like woodrat houses can be constructed to provide opportunities for sheltering and colonization by displaced woodrats.
- Relocated nests are expected to eventually be re-colonized and should be monitored one-year post construction using visual surveys and/or wildlife cameras to determine if a relocated nest has returned to use.

EXHIBIT F

Topographic Site Plan

by Sigma Prime Geosciences, Inc.

Attachment 1

Revision Schedule

#	Revision Description	Date

zfa.com
650.394.8869
copyright © 2019

1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235

Sigma Prime Geosciences, Inc.
SIGMA PRIME GEOSCIENCES, INC.
332 PRINCETON AVENUE
HALF MOON BAY, CA 94019
(650) 728-3590
sigmaprm@gmail.com

PROJECT

REDWOOD LOG CABIN

LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 260

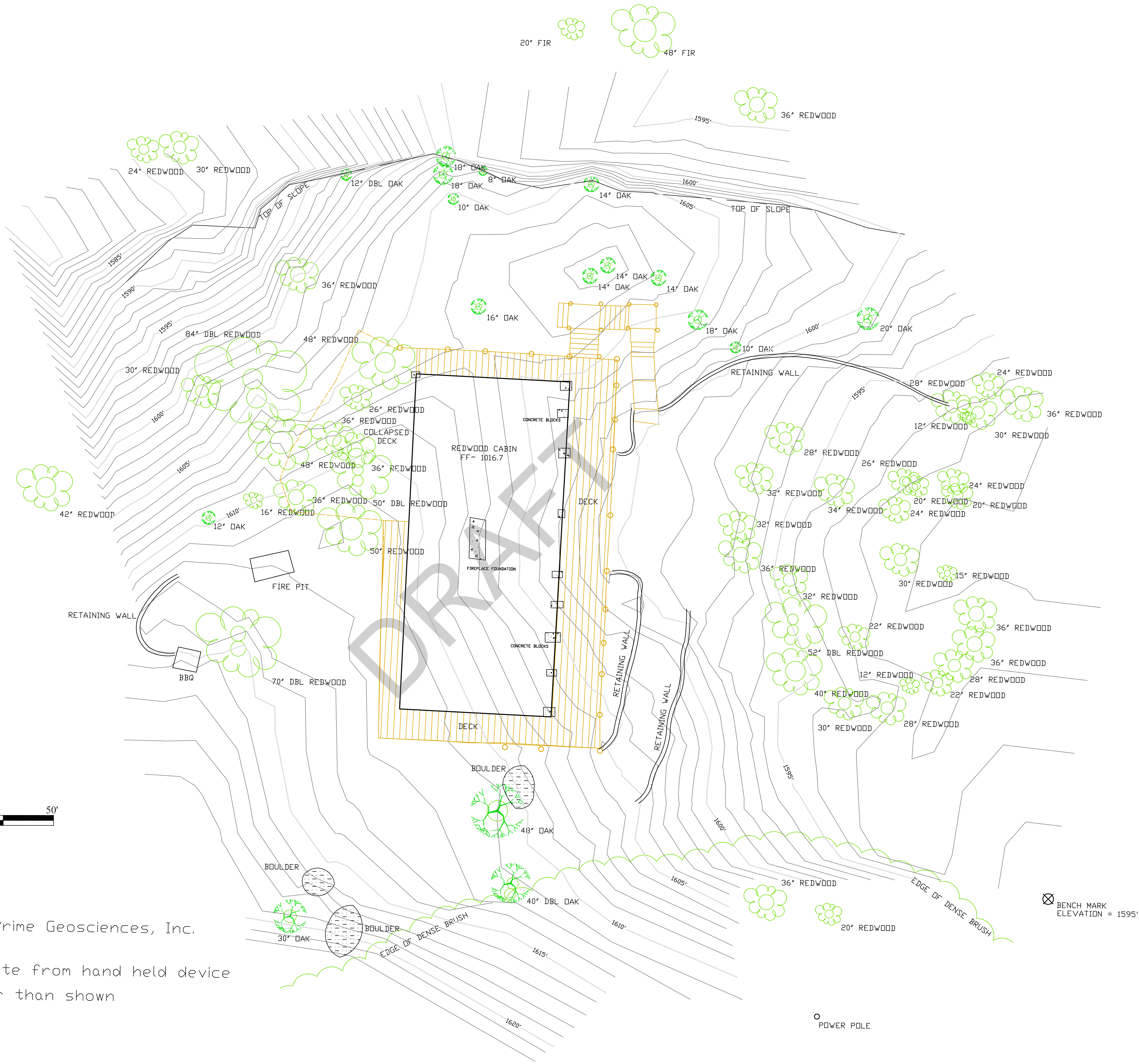
SHEET DESCRIPTION

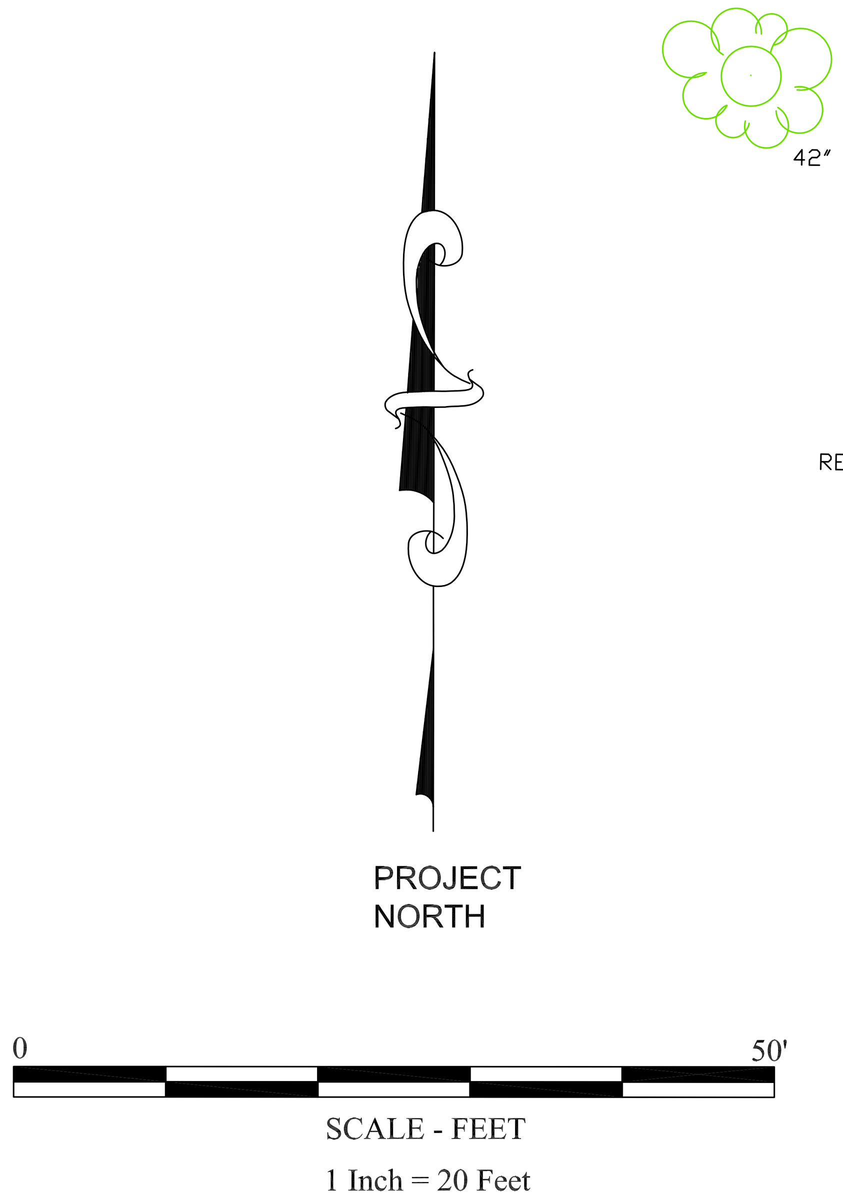
TOPOGRAPHIC SITE PLAN

ENGR: AZG
PM: SRP
DATE: SEPT 30, 2019

SHEET
C1.0

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION





Surveyed July, 2019 by Sigma Prime Geosciences, Inc.
This is not a boundary survey
Elevation datum NAVD88 estimate from hand held device
Tree canopies are much larger than shown

EXHIBIT G

Mothballing Guidelines

by ZFA Structural Engineers

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

Mothballing Guidelines

The focus of mothballing procedures is to stabilize and secure the building:

Stabilization
- Structurally stabilize the building, based on a professional condition assessment.
- Exterminate or control pests, including termites and rodents.
- Protect the exterior from moisture penetration.

Mothballing
- Secure the building and its component features to reduce vandalism or break-ins.
- Provide adequate ventilation to the interior.
- Secure or modify utilities.
- Develop and implement a maintenance and monitoring plan for protection.

Mothballing Checklist

In developing mothballing procedures, the following checklist should be used to ensure that work items are not inadvertently omitted.

Moisture
- Is the roof watertight?
- Do the gutters retain their proper pitch and are they clean?
- Are downspout joints intact?
- Are drains unobstructed?
- Is wood siding in good condition?
- Is site properly graded for water run-off?
- Is vegetation cleared from around the building foundation to avoid trapping moisture?

Pests
- Have nests/pests been removed from the building's interior and eaves?
- Are adequate screens in place to guard against pests?
- Has the building been inspected and treated for termites, carpenter ants, rodents, etc.?
- If toxic droppings from bats, rats and pigeons are present, has a special company been brought in for its disposal?

Housekeeping
- Have the following been removed from the interior: trash, hazardous materials such as inflammable liquids, poisons, and paints and canned goods that could freeze and burst?
- Is the interior broom-clean?
- Have furnishings been removed to a safe location?
- If furnishings are remaining in the building, are they properly protected from dust, pests, ultraviolet light, and other potentially harmful problems?
- Have significant architectural elements that have become detached from the building been labeled and stored in a safe place?
- Is there a building file?

Security
- Have fire and police departments been notified that the building will be mothballed?

- Are smoke and fire detectors in working order?
- Are the exterior doors and windows securely fastened?
- Are plans in place to monitor the building on a regular basis?
- Are the keys to the building in a secure but accessible location?
- Are the grounds being kept from becoming overgrown?

Utilities
- Have utility companies disconnected/shut off or fully inspected water, gas, and electric lines?
- If the building will not remain heated, have water pipes been drained and glycol added?

Ventilation
- Have steps been taken to ensure proper ventilation of the building?
- Have interior doors been left open for ventilation purposes?
- Has the secured building been checked within the last 3 months for interior dampness or excessive humidity?

Maintenance Chart

The following maintenance action items should be considered when developing the maintenance program for the building to be mothballed.

1-3 months; periodic
- Regular drive by surveillance
- Check attic during storms if possible
- Monthly walk arounds
- Check entrances
- Check window coverings for breakage
- Mowing as required
- Check for graffiti or vandalism
- Enter every 3 months to air out
- Check for musty air
- Check for moisture damage
- Check battery packs and monitoring equipment
- Check for evidence of pest intrusion

Every 6 months; spring and fall
- Site clean-up; pruning and trimming
- Gutter and downspout check
- Check crawlspace for pests
- Clean out storm drains

Every 12 months
- Maintenance contract inspections for equipment/utilities
- Check roof for loose or missing shingles
- Termite and pest inspection/treatment
- Exterior materials spot repair and touch up painting
- Remove bird droppings or other stains from exterior
- Maintain building defensible space per Cal Fire standards
- Check and update building file

Reference: Park, Sharon C., 1993. Mothballing Historic Buildings. Preservation Brief No. 31. Department of the Interior, National Park Service. Washington, DC: Government. Printing Office. 15 p. Available online at https://www.nps.gov/tps/how-to-preserve/briefs/31-mothballing.htm

EXHIBIT H

Arborist Report

by Kielty Arborist Services LLC

Kielty Arborist Services LLC
Certified Arborist WE#0476A
P.O. Box 6187
San Mateo, CA 94403
650-515-9783

September 30, 2019

ZFA Structural Engineers
Attn: Mr. Steven Patton
1390 El Camino Real Suite 100
San Carlos, CA 94070
Site: La Honda Creek Redwood Cabin, La Honda, CA

Dear Mr. Patton,

As requested on Wednesday, July 24, 2019, I visited the above site to inspect and comment on the trees. Work is proposed on the existing cabin, and your concern as to the future health and safety of the trees has prompted this visit. This report will go over the existing health of the trees, and how to protect them from potential construction impacts. Once site plans have been completed, they should be sent to the Project Arborist for further review.

Showing site

Method:
All inspections were made from the ground; the trees were not climbed for this inspection. The trees in question were located on a topography map provided by you. The trees were then measured for diameter at 54 inches above ground level (DBH or diameter at breast height). The trees were given a condition rating for form and vitality. The trees condition rating is based on 50 percent vitality and 50 percent form, using the following scale.

1 - 29 Very Poor
30 - 49 Poor
50 - 69 Fair
70 - 89 Good
90 - 100 Excellent

The height of the trees was measured using a Nikon Forestry 550 Hypsometer where possible. The canopy spreads were paced off. Comments and recommendations for future maintenance are provided.

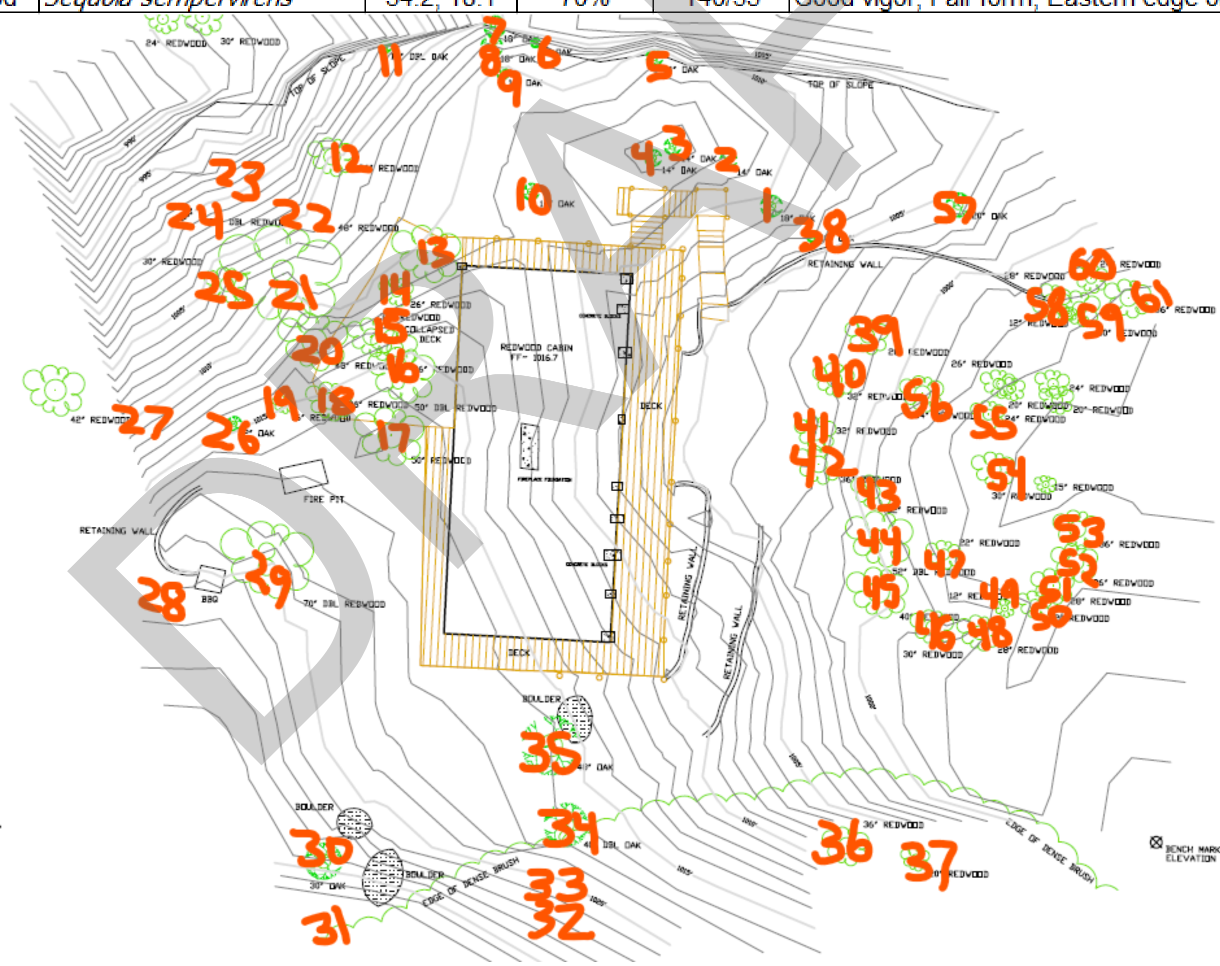
Redwood cabin 9/30/19 (2)

SITE: Mid Peninsula Open Space - Redwood Cabin

Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./Spread	Comments
1	Tan oak	*Notholithocarpus densiflorus*	17.9	55%	60/35	Good vigor, Poor to fair form, Slight lean to south
2	Tan oak	*Notholithocarpus densiflorus*	16.2	60%	55/35	Good vigor, Fair form, Lean south
3	Tan oak	*Notholithocarpus densiflorus*	15.1	60%	55/35	Good vigor, Fair form, Lean south, Shares root zone with #4
4	Tan oak	*Notholithocarpus densiflorus*	12.7	60%	55/35	Good vigor, Fair form, Lean south, Shares root zone with #3
5	Tan oak	*Notholithocarpus densiflorus*	13.3	40%	40/30	Good vigor, Poor form, Decay, Leans north
6	Tan oak	*Notholithocarpus densiflorus*	7.5	50%	35/25	Good vigor, Fair form, Suppressed
7	Tan oak	*Notholithocarpus densiflorus*	13 est	60%	45/30	Good vigor, Fair form, located at edge of bank
8	Madrone	*Arbutus menziesii*	18 est	50%	45/50	Fair vigor, Poor form, Leans west
9	Tan oak	*Notholithocarpus densiflorus*	11	25%	20/15	Fair vigor, Poor form, Decay, Top failed
10	Tan oak	*Notholithocarpus densiflorus*	16.2	60%	55/30	Good vigor, Fair form, 10' from deck
11	Tan oak	*Notholithocarpus densiflorus*	10.7, 13.5	55%	50/35	Good vigor, Fair form, Codominant @ base
12	Redwood	*Sequoia sempervirens*	40.4	70%	140/35	Good vigor, Fair form, Trunk bends north
13	Redwood	*Sequoia sempervirens*	44 est	70%	140/35	Good vigor, Fair form, Corner of cabin
14	Redwood	*Sequoia sempervirens*	36 est	60%	135/30	Good vigor, Fair form, Deck girdling tree
15	Redwood	*Sequoia sempervirens*	34 est	55%	135/30	Good vigor, Fair form, Trunk bends northeast
16	Redwood	*Sequoia sempervirens*	40, 16	55%	140/35	Good vigor, Fair form, Trunk bends northeast, Codominant @ 3'
17	Redwood	*Sequoia sempervirens*	50 est	45%	130/40	Good vigor, Poor form, Topped @ 50'
18	Redwood	*Sequoia sempervirens*	40 est	70%	140/35	Good vigor, Fair form, Single trunk
19	Redwood	*Sequoia sempervirens*	17.5	70%	120/30	Good vigor, Fair form.
20	Redwood	*Sequoia sempervirens*	45	70%	150/35	Good vigor, Fair form
21	Redwood	*Sequoia sempervirens*	67	55%	140/40	Good vigor, Poor to fair form, Codominant @ 2'
22	Redwood	*Sequoia sempervirens*	32.5	65%	135/40	Good vigor, Fair form, Shares root zone with #21
23	Redwood	*Sequoia sempervirens*	36	65%	135/40	Good vigor, Fair form, Shares root zone with #21
24	Redwood	*Sequoia sempervirens*	13	65%	135/40	Good vigor, Fair form, Shares root zone with #21
25	Redwood	*Sequoia sempervirens*	17.3	50%	40/35	Fair vigor, Poor form, Decay
26	Madrone	*Arbutus menziesii*	15.4	35%	35/45	Poor vigor, poor form, Lenas west
27	Tan oak	*Notholithocarpus densiflorus*	18	0%	30/5	DEAD
28	Tan oak	*Notholithocarpus densiflorus*	19.1	60%	45/20	Good vigor, Fair form, Near firepit
29	Redwood	*Sequoia sempervirens*	56	50%	13/45	Good vigor, Poor form, Codominant @ 4'
30	Madrone	*Arbutus menziesii*	30	55%	55/45	Good vigor, Fair form, Supported by boulder
31	Douglas fir	*Pseudotsuga menziesii*	19.6	40%	80/40	Fair vigor, Poor form, Crook in trunk
32	Redwood	*Sequoia sempervirens*	37.8	55%	140/40	Fair vigor, Poor form, Girdled by support wire
33	Redwood	*Sequoia sempervirens*	14.1	60%	60/30	Fair vigor, Fair form
34	Madrone	*Arbutus menziesii*	19.6, 19.0	60%	45/45	Good vigor, Fair form, Codominant @ 4'
35	Madrone	*Arbutus menziesii*	39.1	35%	55/40	Good vigor, Poor form, Decay @ base, Heavy over cabin
36	Redwood	*Sequoia sempervirens*	48 est	60%	140/40	Good vigor, Fair form, Codominant @ 20'
37	Redwood	*Sequoia sempervirens*	25.7	65%	120/40	Good vigor, Fair form, Suppressed by #36
38	Tan oak	*Notholithocarpus densiflorus*	7.8	65%	35/25	Good vigor, Fair form, Located at retaining wall
39	Redwood	*Sequoia sempervirens*	28.5	70%	140/35	Good vigor Fair form.
40	Redwood	*Sequoia sempervirens*	30.5	60%	140/35	Good vigor, Fair form, Shares root zone with #39
41	Redwood	*Sequoia sempervirens*	30.6	60%	140/35	Good vigor, Fair form, Shares root zone with #40
42	Redwood	*Sequoia sempervirens*	37.5, 13, 12	55%	130/40	Good vigor, Poor to fair form, Multi leader @ base
43	Redwood	*Sequoia sempervirens*	28.1	60%	130/35	Good vigor, Fair form, Center of grove
44	Redwood	*Sequoia sempervirens*	41	65%	130/35	Good vigor, Fair form, Shares root zone with #45
45	Redwood	*Sequoia sempervirens*	45.2	60%	140/35	Good vigor, Fair form, Fire scar

Redwood cabin 9/30/19 (3)

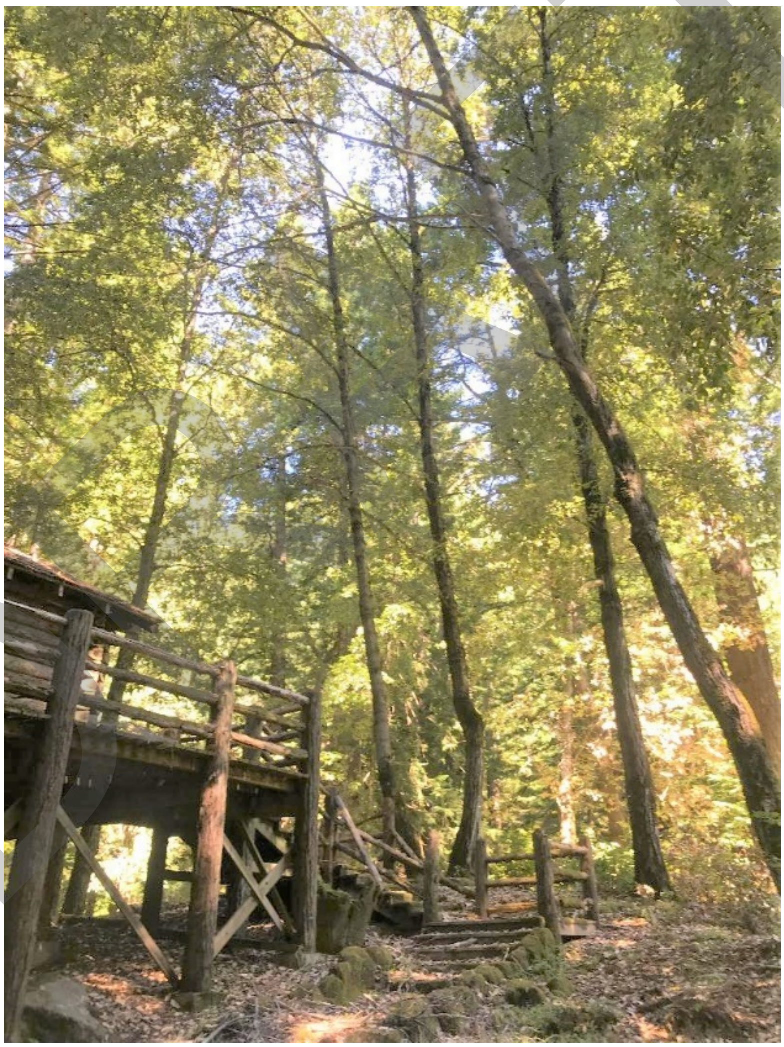
Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./Spread	Comments
46	Redwood	*Sequoia sempervirens*	20	55%	140/50	Good vigor, Poor to fair form, Multi leader, Fire scar
47	Redwood	*Sequoia sempervirens*	21.1, 27.8	55%	130/40	Good vigor, Poor to fair form, Codominant @ base
48	Redwood	*Sequoia sempervirens*	38.8, 42.3	55%	130/40	Good vigor, Poor to fair form, Codominant @ base
49	Redwood	*Sequoia sempervirens*	15.3	60%	75/30	Good vigor, Fair form, Leans east
50	Redwood	*Sequoia sempervirens*	29.7	65%	130/25	Good vigor, Fair form, Center of grove, Tall for DBH
51	Redwood	*Sequoia sempervirens*	26.3	65%	130/25	Good vigor, Fair form, Center of grove, Tall for DBH
52	Redwood	*Sequoia sempervirens*	26.6, 21.3	55%	130/55	Good vigor, Fair form, Codominant @ base
53	Redwood	*Sequoia sempervirens*	27.1, 18.3	55%	130/55	Good vigor, Fair form, Codominant @ base
54	Redwood	*Sequoia sempervirens*	31.2	60%	140/35	Good vigor, Fair form, located in center of grove
55	Redwood	*Sequoia sempervirens*	15.11	55%	75/30	Good vigor, Fair form, located in center of grove
56	Redwood	*Sequoia sempervirens*	11.8	55%	75/30	Good vigor, Fair form, located in center of grove
57	Tan oak	*Notholithocarpus densiflorus*	19.3	70%	65/45	Good vigor, Fair form
58	Redwood	*Sequoia sempervirens*	27.9, 23.2	55%	120/35	Good vigor, Poor to fair form, Codominant @ 2'
59	Redwood	*Sequoia sempervirens*	27.9, 28	55%	120/35	Good vigor, Poor to fair form, Codominant @ 2'
60	Redwood	*Sequoia sempervirens*	33.1	70%	140/35	Good vigor, Fair form, Shares root zone with #59
61	Redwood	*Sequoia sempervirens*	34.2, 18.1	70%	140/35	Good vigor, Fair form, Eastern edge of grove



Showing tree locations

Redwood cabin 9/30/19 (4)

Summary:
The trees on site are all native trees to the area. No imported species were observed. The trees consist of redwood trees, tan oaks, madrone, and Douglas fir trees. Trees with a condition rating under 50 (poor trees) are recommended to receive maintenance. The tan oak trees, and madrone trees are understory trees, meaning they grow underneath the large canopies of the redwood and Douglas fir trees. The tan oaks and madrone trees all have grown at a natural lean due to the suppressed conditions. Tan oak trees #5, 9, and 27 are in poor condition. Decay was observed at the root crowns of tan oak trees #5 and #9. The top of tan oak tree #9 has also failed in the past. Due to the tree leans in combination with decay at the root crown, these trees are recommended for removal due to a high risk of failure. Tan oak tree #27 is dead and recommended for removal as soon as possible. The remaining tan oak trees are in fair to good condition.



Showing tan oaks

Trees recommended for removal:
Madrone trees #26 and #35 are the only madrone trees in poor condition. Madrone tree #26 has poor vigor with 50% or more of the canopy being dead. This tree also is growing at a heavy lean. No mitigation measures would be expected to help improve the tree; therefore, tree removal is recommended. Madrone tree #35 has good vigor but poor form. The tree grows at a heavy lean over the existing cabin on site. A large decay section was observed on the compression side of the tree's lean. The decayed area starts at grade and extends 8 feet up the trunk of the tree. Because the decayed area is on the compression side of the tree's lean, it acts as a natural tree falling hinge. This tree is hazardous and should be removed as the target at the point of failure is the existing cabin.

(Red line showing large decayed area)

(Showing girdled tree)

Summary continued:
The majority of the redwood trees on site are in fair to good condition. The only redwood trees that are recommended to receive maintenance are the codominant redwood trees and girdled redwood trees. Redwood trees rarely experience a whole tree failure. Redwood trees due tend to shed limbs when under drought like stress. The codominant redwood trees should be cabled and reduced where necessary to reduce stress to the poorly formed unions. This will help to reduce risk of a codominant leader failure due to the poor form. Redwood tree #14 is being girdled by the remaining portion of the existing deck. This portion of the deck should be removed to eliminate the trees risk of dying due to being girdled. Girdling trees chokes out the vascular cambium system and stops the flow of water and nutrients causing trees to eventually die. Redwood tree #32 is being girdled by a PG & E support wire. This wire should be removed as soon as possible. The trees on site should be reassessed every 3-5 years for any needed maintenance. The following tree protection plan will help to ensure the future survival of the trees on site.

Tree Protection Plan:

Tree Protection Zones

Tree protection zones should be installed and maintained throughout the entire length of the project. Fencing for tree protection zones should be 6' tall, metal chain link material supported by metal 1.5" diameter poles, pounded into the ground to a depth of no less than 2'. The distance between metal support poles shall not be more than 10'. The location for the protective fencing for the trees on site should be placed at the tree driplines where possible. Where it is not possible to place tree protection zones at the dripline because of approved proposed work or existing hardscapes, the tree protection fencing shall be placed at the edge of the proposed work or hardscapes, but not closer than 2 feet from the trunk of any tree. No equipment or materials shall be stored or cleaned inside the protection zones. Areas where tree protection fencing needs to be reduced for access, should be mulched with 6" of coarse wood chips with ½ inch plywood on top (landscape barrier). The plywood boards should be attached together in order to minimize movement. The spreading of chips will help to reduce risk of soil compaction. All tree protection measures must be installed prior to any demolition or construction activity at the site.

Avoid the following conditions:
DO NOT:

- **A.** Allow run off of spillage of damaging materials into the area below any tree canopy.
- **B.** Store materials, stockpile soil, or park or drive vehicles within the TPZ.
- **C.** Cut, break, skin, or bruise roots, branches, or trunks without first obtaining authorization from the Project Arborist.
- **D.** Allow fires under and adjacent to trees.
- **E.** Discharge exhaust into foliage.
- **F.** Secure cable, chain, or rope to trees or shrubs.
- **G.** Trench, dig, or otherwise excavate within the dripline or TPZ of the tree(s) without first obtaining authorization from the Project Arborist.

Landscape Buffer

Where tree protection does not cover the entire root zone of the trees at the dripline, or when a smaller tree protection zone is needed for access, a landscape buffer consisting of wood chips spread to a depth of six inches with plywood or steel plates placed on top will be placed where foot traffic is expected to be heavy. The landscape buffer will help to reduce compaction to the unprotected root zone.

Root Cutting and Grading

Avoid injury to tree roots. When a ditching machine, which is being used outside of the dripline of trees, encounters roots smaller than 2", the wall of the trench adjacent to the trees shall be hand trimmed, making clear, clean cuts through the roots. All damaged, torn and cut roots shall be given a clean cut to remove ragged edges, which promote decay. Trenches shall be filled within 24 hours, but where this is not possible, the side of the trench adjacent to the trees shall be kept shaded with four layers of dampened, untreated burlap, wetted as frequently as necessary to keep the burlap wet. Roots 2" or larger, when encountered, shall be reported immediately to the Project

Arborist, who will decide whether the Contractor may cut the root as mentioned above or shall excavate by hand or with compressed air under the root. Root is to be protected with dampened burlap. All roots to be cut shall be monitored and documented. Large roots (over 2” diameter) or large masses of roots to be cut must be inspected by the Project Arborist. The Project Arborist, at this time, may recommend irrigation or fertilization of the root zone. Existing grades underneath the protected tree driplines are to remain as is. If grade changes greater than 4 inches are to take place, special mitigation measures will be needed to reduce impacts to the trees.

Trenching and Excavation (for any reason)
Route pipes outside of the area that is 10 times the diameter of a protected tree to avoid conflict with roots. If this is not possible, trenching for irrigation, drainage, electrical or any other reason shall be done by hand in combination with an air spade when inside the dripline of a protected tree. Hand digging and the careful placement of pipes below or besides protected roots will significantly reduce root loss, thus reducing trauma to the tree. All trenches shall be backfilled with native materials and compacted to near its original level, as soon as possible. Trenches to be left open for a period of time, will require the covering of all exposed roots with burlap and be kept moist. The trenches will also need to be covered with plywood to help protect the exposed roots. When utilities need to be placed within a distance of 3 times the diameter or less of a protected tree on site, the Contractor shall bore beneath the dripline of the tree. The boring shall take place not less than 3' below the surface of the soil in order to avoid encountering "feeder" roots.

Pruning
Any needed or recommended pruning shall be supervised by the Project Arborist, and must be done by a licensed tree care provider. All pruning for trees in fair to good health must stay underneath 25% of the total foliage of the canopy.

Irrigation
Because the trees observed on site are all native trees, no supplemental irrigation is required. Anytime the trees are to be impacted by minor root cutting, supplemental irrigation should be applied.

Construction related damage to trees
Any damage due to construction activities shall be reported to the Project Arborist within 24 hours so that remedial action can be taken.

Inspections
It is the contractor’s responsibility to contact the site arborist when work is to take place within 10 times the diameter of a tree on site. Kielty Arborist Services can be reached by email at kkarbor0476@yahoo.com or by phone at (650) 515-9783 (Kevin), or (650) 532-4418 (David).

The information included in this report is believed to be true and based on sound arboricultural principles and practices.

Kevin Kielty

Sincerely, Kevin R. Kielty, Certified Arborist WE#0476A

Kielty Arborist Services
P.O. Box 6187
San Mateo, CA 94403
650-515-9783

ARBORIST DISCLOSURE STATEMENT

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like a medicine, cannot be guaranteed.

Treatment, pruning, and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, landlord-tenant matters, etc. Arborists cannot take such issues into account unless complete and accurate information is given to the arborist. The person hiring the arborist accepts full responsibility for authorizing the recommended treatment or remedial measures.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risks is to eliminate all trees.

Arborist: Kevin Kielty
Kevin R. Kielty

Date: September 30, 2019

EXHIBIT I

Conceptual Cost Estimate

by OCMI

Mid-Peninsula Open Space District
Mid-Peninsula Stabilization

La Honda, CA

ZFA Structural Engineers
CONCEPTUAL COST ESTIMATE,R2
OCMI JOB #: 19414.000
18 December 2019

OC INSIGHT

COST ESTIMATE

INTRODUCTORY NOTES

This estimate is based on verbal direction from the client and the following items, received 30 September 2019:

General

ZFA Structural Engineers BOD Reports dated October 2019.
Sketches of 11 July 2019 with BOD option notes per Report.
Terracon Hazmat report dated 8-13-19.
Kielty Arborist Services LLC Report dated 9-30-19.
Page & Turnbull Inc. BOD & Alternative Evaluation dated 9-30-19.
ZFA Structural Engineers draft estimate review comments 10-31-19.
Comments and clarifications received through 11 December 2019.

The following items are excluded from this estimate:

- Professional fees.
- Building permits and fees.
- Inspections and tests.
- Furniture, fixtures & equipment, except as noted.
- Installation of owner furnished equipment.
- Construction change order contingency.
- Overtime.
- Items referenced as NOT INCLUDED or NIC in estimate.

The midpoint of construction of January 2021 is based on:

- Construction start date of July 2020
- Estimated construction duration of 12 months

- This estimate is based on a Design-Bid-Build delivery method.
- This estimate is based on prevailing wage labor rates.
- This estimate is based on a detailed measurement of quantities. We have made allowances for items that were not clearly defined in the drawings. The client should verify these allowances.
- This estimate is based on a minimum of four competitive bids and a stable bidding market.
- This estimate should be updated if more definitive information becomes available, or if there is any change in scope.
- We strongly advise the client to review this estimate in detail. If any interpretations in this estimate appear to differ from those intended by the design documents, they should be addressed immediately.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	$/SF AREA
WHITE BARN OPTIONS:			
01. WHITE BARN - OPTION 1	$39,004	1,012	$38.54
01A. OPTION 1 MAINTENANCE COSTS	$144,000		
02. WHITE BARN - OPTION 2	$116,423	1,012	$115.04
02A. OPTION 2 MAINTENANCE COSTS	$288,000		
03. WHITE BARN - OPTION 3	$396,904	1,012	$392.20
03A. OPTION 3 MAINTENANCE COSTS	$288,000		
04. WHITE BARN - OPTION 4	$171,982	1,012	$169.94
REDWOOD CABIN OPTIONS:			
05. REDWOOD LOG CABIN - OPTION 1	$54,250	1,980	$27.40
05A. OPTION 1 MAINTENANCE COSTS	$144,000		
06. REDWOOD LOG CABIN - OPTION 2	$194,501	1,980	$98.23
06A. OPTION 2 MAINTENANCE COSTS	$288,000		
07. REDWOOD LOG CABIN - OPTION 3	$736,793	1,980	$372.12
07A. OPTION 3 MAINTENANCE COSTS	$288,000		
08. REDWOOD LOG CABIN - OPTION 4	$245,869	1,980	$124.18
BEATTY PROPERTY OPTIONS:			
09. BEATTY PROPERTY - OPTION 1	$63,920	1,912	$33.43
09A. OPTION 1 MAINTENANCE COSTS	$144,000		
10. BEATTY PROPERTY - OPTION 2	$208,791	1,912	$109.20
10A. OPTION 2 MAINTENANCE COSTS	$288,000		
11. BEATTY PROPERTY - OPTION 3	$674,313	1,912	$352.67
11A. OPTION 3 MAINTENANCE COSTS	$288,000		
12. BEATTY PROPERTY - OPTION 4	$233,284	1,912	$122.01

1.) The numbers above include mark-ups including escalation to January 2021 at 5% Per Annum. contractor general conditions and insurances.

2.) Design contingency is zero for options 1 and 4. 5% for option 2, and 10% for option 3.

3.) The Owner should add for soft costs and include a separate construction contingency.

4.) Long term maintenance costs have been separated to delineate from capitol costs.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$34,249	$33.84
NET DIRECT BUILDING COST		$34,249	$33.84
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$3,425	$3.38
SUBTOTAL		$37,674	$37.23
INSURANCE	2.00%	$753	$0.74
SUBTOTAL		$38,427	$37.97
BONDS: CONTRACTOR	1.50%	$576	$0.57
TOTAL BUILDING COST		**$39,004**	**$38.54**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$34,249		$33.84
111 Site Preparation	$6,850		$6.77	
112 Site Improvements	$27,399		$27.07	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$34,249**		**$33.84**

DRAFT

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)		NIC		
This design idea was not practical due to location				
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$6,850**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	300	LF	67.42	$20,226
Add for barbed wire outrigger	300	LF	7.42	$2,225
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$27,399**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$25,040	$24.74
04 EXTERIOR CLOSURE		$23,320	$23.04
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$49,002	$48.42
NET DIRECT BUILDING COST		$97,362	$96.21
DESIGN CONTINGENCY	5.00%	$4,868	$4.81
SUBTOTAL		$102,230	$101.02
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$10,223	$10.10
SUBTOTAL		$112,453	$111.12
INSURANCE	2.00%	$2,249	$2.22
SUBTOTAL		$114,702	$113.34
BONDS: CONTRACTOR	1.50%	$1,721	$1.70
TOTAL BUILDING COST		**$116,423**	**$115.04**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$25,040		$24.74
031 Floor and Roof Construction	$25,040		$24.74	
032 Stair Construction				
04 EXTERIOR CLOSURE		$23,320		$23.04
041 Exterior Walls	$23,320		$23.04	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$49,002		$48.42
111 Site Preparation	$49,002		$48.42	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$97,362**		**$96.21**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Add pressure treated blocking and shims at deteriorated wood grade beams to prevent further settlement	120	LF	30.00	$3,600
Structure strengthening at walls				
Wall braces inside exterior wall for lateral strengthening				
Treated timber cross braces, 2x10 each side of post				
Cross braces at Grid 1 & 3, 18' average lengths	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
Cross braces at Grid A & F, 18' long	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$25,040**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building, limited				
Close off doors, board up with plywood	240	SF	15.00	$3,600
Fill other miscellaneous openings, windows and gaps	1,012	SF	10.00	$10,120
Rehab windows				
Repair window frames	56	LF	50.00	$2,800
Add / replace sills with stop and bead for new pane	56	LF	45.00	$2,520
Clear lexan view panel	86	SF	40.00	$3,440
Paint and seal window frames	56	LF	15.00	$840
TOTAL - 041 EXTERIOR WALLS				**$23,320**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure				
Shoring and support work, Allowance	1,012	SF	10.00	$10,120
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$49,002**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$26,117	$25.81
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$83,050	$82.07
04 EXTERIOR CLOSURE		$26,571	$26.26
05 ROOFING		$32,872	$32.48
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$146,258	$144.52
NET DIRECT BUILDING COST		$314,868	$311.13
DESIGN CONTINGENCY	5.00%	$15,743	$15.56
SUBTOTAL		$330,611	$326.69
ESCALATION TO MIDPOINT 01/2021	5.42%	$17,908	$17.70
SUBTOTAL		$348,520	$344.39
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$34,852	$34.44
SUBTOTAL		$383,371	$378.83
INSURANCE	2.00%	$7,667	$7.58
SUBTOTAL		$391,039	$386.40
BONDS: CONTRACTOR	1.50%	$5,866	$5.80
TOTAL BUILDING COST		**$396,904**	**$392.20**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$26,117		$25.81
011 Standard Foundations	$26,117		$25.81	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$83,050		$82.07
031 Floor and Roof Construction	$83,050		$82.07	
032 Stair Construction				
04 EXTERIOR CLOSURE		$26,571		$26.26
041 Exterior Walls	$26,571		$26.26	
042 Exterior Doors/Windows				
05 ROOFING		$32,872		$32.48
051 Roofing	$32,872		$32.48	
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$146,258		$144.52
111 Site Preparation	$98,758		$97.59	
112 Site Improvements	$47,500		$46.94	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$314,868**		**$311.13**

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (130 lf)	14	CY	1,520.72	$21,966
Spread/pad footings under posts, 3'x3'x2.5' deep (4ea)	3	CY	1,245.34	$4,151
TOTAL - 011 STANDARD FOUNDATIONS				**$26,117**
ELEMENT - SUBSTRUCTURE				
021 SLAB ON GRADE				
Slab on grade retrofit work				
Note: Alternate option of slab on grade in lieu of replacing sub floor framing assumed not required		NIC		
TOTAL - 021 SLAB ON GRADE				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Replace 8x8 bearers, mount on new footings	120	LF	30.00	$3,600
Replace floor joists, 2x10 joists @ 16" o.c	1,012	SF	17.50	$17,710
Replace floor sheathing, 3/4" plywood	1,012	SF	6.40	$6,477
Anchors, joists and bearers into foundations	18	EA	250.00	$4,500
Roofing replacement work				
Replace rafters tails (2x6 Rafters @ 3' o.c, sloped)	243	SF	30.00	$7,286
Install roof sheathing, 1/2" plywood over skip sheathing	1,214	SF	5.40	$6,558
Repair skip sheathing	1,214	SF	2.50	$3,036
Blocking between rafters at perimeter wall	140	LF	27.50	$3,850
Strengthening structure at walls				
Replace 4x4 knee braces to side bays	8	EA	240.00	$1,920
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall sections)	1,048	SF	15.00	$15,720
Plywood sheathing, 1/2"	1,048	SF	4.60	$4,821
Plywood shear nailing	1,048	SF	1.50	$1,572
HDU's, hold downs bolted to sub structure framing	12	EA	150.00	$1,800
Seismic anchors below wall into foundations	12	EA	350.00	$4,200
Alternate option of steel tension rod bracing from roof to foundations not anticipated		NIC		
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$83,050**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall cladding work				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Selective replacement 10% - 20%, old growth wood siding, vertically run	378	SF	17.50	$6,608
Check battens/ sub structure for status and report				
Paint exterior				
Exterior wood cladding (Paint entire building)	1,248	SF	3.23	$4,025
Premium at barn swing doors	2	EA	500.00	$1,000
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Solid heavy duty panel doors on frame with H.D Hinges				
Single, wide swing	2	EA	3,626.93	$7,254
Locks and associated hardware	2	EA	630.00	$1,260
Wood windows, dual glazed	75	SF	70.65	$5,299
Paint window frames	75	SF	15.00	$1,125
TOTAL - 041 EXTERIOR WALLS				**$26,571**
ELEMENT - ROOFING				
051 ROOFING				
Roof replacement				
Skip sheathing to remain				
Plywood sheathing or underlayment board installed over skip sheathing	1,214	SF	3.21	$3,898
Corrugated metal roofing, steel pitch premium	1,214	SF	21.35	$25,922
(saving of $11,960 to project if metall roofing salvaged)				
Flashings and roof plumbing				
Metal cap ridge flashings	40	LF	31.84	$1,273
Metal edge rake coping	62	LF	28.51	$1,779
TOTAL - 051 ROOFING				**$32,872**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Earthwork				
Excavate existing soil under the building, 24" deep				
Excavate, small machine (Temporary demo access)	82	CY	150.00	$12,369
Machine move dirt to outside building	82	CY	75.00	$6,184
Clean out dirt around posts and structure, by hand	1,012	SF	10.00	$10,120
Site off haul				
Load tracks	99	CY	25.00	$2,474
Haul dirt	99	CY	60.00	$5,937
Dispose dirt	99	CY	30.00	$2,969
Sub floor replacement work				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove 8x8 bearers, mounted on grade	120	LF	10.00	$1,200
Remove floor joists, piecemeal in existing structure	1,012	SF	5.00	$5,060
Remove floor sheathing, piecemeal in existing structure	1,012	SF	1.75	$1,771
Roofing replacement work				
Remove rafter tails, for replacement	243	SF	10.00	$2,429
Skip sheathing to remain				
Roof replacement				
Remove corrugated metal roofing	1,214	SF	2.40	$2,915
Remove flashings and roof plumbing				
Metal cap ridge flashings	40	LF	6.00	$240
Metal edge rake coping	62	LF	5.00	$310
Exterior wall cladding work				
Remove 10% to 20% old growth wood siding, vertically run	250	SF	5.00	$1,248
Check battens/ sub structure for status and report				
Hazmat demolition				
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	10,000.00	$10,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$98,758**

ELEMENT - SITEWORK

112 SITE IMPROVEMENTS

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	27,500.00	$27,500
Planting improvements	1	LS	10,000.00	$10,000
TOTAL - 112 SITE IMPROVEMENTS				**$47,500**

On-going maintenance, 20 year period

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$151,016	$149.23
NET DIRECT BUILDING COST		$151,016	$149.23
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$15,102	$14.92
SUBTOTAL		$166,118	$164.15
INSURANCE	2.00%	$3,322	$3.28
SUBTOTAL		$169,440	$167.43
BONDS: CONTRACTOR	1.50%	$2,542	$2.51
TOTAL BUILDING COST		**$171,982**	**$169.94**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$151,016		$149.23
111 Site Preparation	$151,016		$149.23	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$151,016**		**$149.23**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,012	SF	2.00	$2,024
Remove metal flashings	130	LF	5.00	$650
Remove exterior siding	1,500	SF	5.00	$7,500
Remove barn doors	3	EA	300.00	$900
Remove roof sheathing	1,012	SF	2.00	$2,024
Demolish wood framed structure	1,012	SF	20.00	$20,240
Demolish flooring	1,012	SF	5.00	$5,060
Demolish sub floor framing	1,012	SF	10.00	$10,120
Remove wood				
Load wood debris in trucks	187	CY	20.00	$3,748
Haul wood in trucks	187	CY	40.00	$7,496
Dispose	187	CY	15.00	$2,811
Hazmat demolition				
Hazmat monitoring and clearance	412	SF	5.00	$2,059
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
Biologist monitoring	1	LS	3,000.00	$3,000
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$151,016**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$47,637	$24.06
NET DIRECT BUILDING COST		$47,637	$24.06
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$4,764	$2.41
SUBTOTAL		$52,401	$26.47
INSURANCE	2.00%	$1,048	$0.53
SUBTOTAL		$53,449	$26.99
BONDS: CONTRACTOR	1.50%	$802	$0.40
TOTAL BUILDING COST		**$54,250**	**$27.40**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$47,637		$24.06
111 Site Preparation	$17,245		$8.71	
112 Site Improvements	$30,392		$15.35	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$47,637**		**$24.06**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Approved weed abatement product to perimeter of structure	198	LF	2.50	$495
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$17,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	340	LF	67.42	$22,922
Add for barbed wire outrigger	340	LF	7.42	$2,522
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$30,392**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$42,979	$21.71
04 EXTERIOR CLOSURE		$27,023	$13.65
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$92,655	$46.80
NET DIRECT BUILDING COST		$162,657	$82.15
DESIGN CONTINGENCY	5.00%	$8,133	$4.11
SUBTOTAL		$170,790	$86.26
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$17,079	$8.63
SUBTOTAL		$187,869	$94.88
INSURANCE	2.00%	$3,757	$1.90
SUBTOTAL		$191,626	$96.78
BONDS: CONTRACTOR	1.50%	$2,874	$1.45
TOTAL BUILDING COST		**$194,501**	**$98.23**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$42,979		$21.71
031 Floor and Roof Construction	$42,979		$21.71	
032 Stair Construction				
04 EXTERIOR CLOSURE		$27,023		$13.65
041 Exterior Walls	$27,023		$13.65	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$92,655		$46.80
111 Site Preparation	$87,185		$44.03	
112 Site Improvements				
113 Site Utilities	$5,470		$2.76	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$162,657**		**$82.15**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Foundation support for building				
Cribbing per Corp of Engineers - refer to Site Preparation				
TOTAL - 011 STANDARD FOUNDATIONS				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	22.00	$4,202
Replace porch framing, East side (Allow 50%)				
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$42,979**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off windows, board up with plywood	285	SF	12.50	$3,563
Close off doors, board up with plywood	84	SF	15.00	$1,260
Close off skylights, bpard up with plywood	240	SF	10.00	$2,400
Fill other miscellaneous openings and gaps	1,980	SF	10.00	$19,800
TOTAL - 041 EXTERIOR WALLS				**$27,023**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Pressure treated wood box cribbing, 6x6 members				
West elevation, 6' high, 2 blocks per lvl, 3' long(24 EA)	7	EA	2,160.00	$15,120
Prepare grade and sub floor for cribbing	7	EA	420.00	$2,940
North elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
South elevation, 6' high, 2 blocks per lvl, 3' long(24EA)	3	EA	2,160.00	$6,480
Prepare grade and sub floor for cribbing	3	EA	420.00	$1,260
East elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
East elevation, 12' high, 2 blocks per lvl, 3' long(48 EA)	1	EA	4,320.00	$4,320
Prepare grade and sub floor for cribbing	1	EA	420.00	$420
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	500.00	$500
Removal and disposal of shrubs	1	LS	250.00	$250
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Large tree removal (3 Tan oaks, 2 Madrones) - 5 Total	5	EA	2,500.00	$12,500
Debris removal, grinding	5	EA	1,500.00	$7,500
Remove girdle from Redwood trees, per Arborist report	2	EA	500.00	$1,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
TOTAL - 111 SITE PREPARATION				**$87,185**
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Utility disconnections				
Disconnect plumbing and provide cap/valve	1	LS	2,380.00	$2,380
Disconnect power and safe off	1	LS	2,210.00	$2,210
Remove obsolete power board	1	LS	880.00	$880
On-going maintenance, 20 year period - separated out				
TOTAL - 113 SITE UTILITIES				**$5,470**
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$141,497	$71.46
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$165,195	$83.43
04 EXTERIOR CLOSURE		$36,720	$18.55
05 ROOFING			
06 INTERIOR CONSTRUCTION		$10,280	$5.19
07 CONVEYING			
08 MECHANICAL		$86,770	$43.82
09 ELECTRICAL		$44,150	$22.30
10 EQUIPMENT		$15,381	$7.77
11 SITEWORK		$84,512	$42.68
NET DIRECT BUILDING COST		$584,505	$295.20
DESIGN CONTINGENCY	5.00%	$29,225	$14.76
SUBTOTAL		$613,730	$309.96
ESCALATION TO MIDPOINT 01/2021	5.42%	$33,244	$16.79
SUBTOTAL		$646,974	$326.75
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$64,697	$32.68
SUBTOTAL		$711,671	$359.43
INSURANCE	2.00%	$14,233	$7.19
SUBTOTAL		$725,905	$366.62
BONDS: CONTRACTOR	1.50%	$10,889	$5.50
TOTAL BUILDING COST		**$736,793**	**$372.12**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$141,497		$71.46
011 Standard Foundations	$141,497		$71.46	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$165,195		$83.43
031 Floor and Roof Construction	$165,195		$83.43	
032 Stair Construction				
04 EXTERIOR CLOSURE		$36,720		$18.55
041 Exterior Walls	$36,720		$18.55	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION		$10,280		$5.19
061 Partitions				
062 Interior Finishes	$10,280		$5.19	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$86,770		$43.82
081 Plumbing	$83,470		$42.16	
082 H.V.A.C.	$3,300		$1.67	
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$44,150		$22.30
091 Standard Electrical	$44,150		$22.30	
092 Special Electrical				
10 EQUIPMENT		$15,381		$7.77
101 Fixed/Movable Equipment				
102 Furnishings	$15,381		$7.77	
103 Special Construction				
11 SITEWORK		$84,512		$42.68
111 Site Preparation	$24,512		$12.38	
112 Site Improvements	$35,000		$17.68	
113 Site Utilities	$25,000		$12.63	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$584,505**		**$295.20**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid 1 & 3) Part hand machine dig/ rebar cages	46	CY	1,188.13	$54,707
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid A,B,C,D) Part hand machine dig/ rebar cages	51	CY	1,188.13	$60,621
Spread/pad footings under posts, 3'x3'x3.5' deep, exterior	14.0	CY	983.81	$13,773
Spread/pad footings under posts, 3'x3'x3.5' deep, interior	12.6	CY	983.81	$12,396
TOTAL - 011 STANDARD FOUNDATIONS				**$141,497**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing repairs				
Trim 12" off base of existing timber posts resting on grade	19	EA	340.00	$6,460
Treat seal base of poles	19	EA	320.00	$6,080
Achor base plates with knife plates connected into footing	19	EA	750.00	$14,250
Anchors connecting poles into new footings	19	EA	450.00	$8,550
Floor leveling				
Systematically level floor to correct settlement				
Hydraulic jack at new pad locations - see item below				
Lift/level floor level, hydraulic jack, difficult terrain	990	SF	13.00	$12,870
(Allow 50% floor area)				
Sub floor strengthening				
Add sub floor braces at foundation tie beams				
Treated timber cross braces, 4x10 each side of post				
Cross braces at Grid 1 & 3, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Cross braces at Grid A,B,C,D, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Wall/structure strengthening				
Retrofit 8x8 posts, 8' o.c, inside face of exterior walls	30	EA	432.00	$12,960
Fix posts to logs, simpson 0.22"x15" log screws (x2)	30	EA	495.00	$14,850
(Assume 12 logs per post and 24 fixings)				
Anchor posts, T&B (Roof diaphram & bottom to sub floor)	30	EA	425.00	$12,750
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Repair/replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	12.00	$2,292
Replace porch framing, East side (Allow 50%)				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
Floor system inside building, part replacement 10%				
T&G flooring, 1x6 fixed over Diagnol sheathing	198	SF	25.00	$4,950
Diagnol sheathing, 1x6 fixed over framing	198	SF	10.00	$1,980
Floor joists, 4"x5-1/2" @ 24" o.c	198	SF	9.50	$1,881
floor beams/bearers, 2"x5-1/2" over posts	50	LF	12.50	$625
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$165,195**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall repairs				
Replace lower 3 rows of logs to perimeter walls, install piecemeal so deconstruct is not required, crafting of new logs to match existing geometries and texture	194	LF	64.00	$12,416
Replace additional 4' at ends of corner logs, staggered laps splicing of new to existing logs	256	LF	67.83	$17,364
Allow to re-secure walls/ stacked logs	194	LF	10.00	$1,940
Allow shoring for the work	1	LS	5,000.00	$5,000
TOTAL - 041 EXTERIOR WALLS				**$36,720**
ELEMENT - INTERIOR CONSTRUCTION				
062 INTERIOR FINISHES				
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660
Refinish existing wood flooring				
Finish wood floor with Tung oil	1,900	SF	3.80	$7,220
TOTAL - 062 INTERIOR FINISHES				**$10,280**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - MECHANICAL				
082 H.V.A.C.				
Kitchen renovation				
Replace kitchen flue	1	LS	1,800.00	$1,800
Stove vent, per city no stove		NIC		
Hot water vent	1	LS	1,500.00	$1,500
TOTAL - 082 H.V.A.C.				**$3,300**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to switchboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,980	SF	12.50	$24,750
Conduit and wiring	1,980	SF	5.00	$9,900
TOTAL - 091 STANDARD ELECTRICAL				**$44,150**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	20	LF	374.23	$7,485
Countertop, plastic laminate with backsplash	20	LF	114.50	$2,290
Wall cabinet, plastic laminate	20	LF	280.30	$5,606
TOTAL - 102 FURNISHINGS				**$15,381**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building demolition				
Electrical demolition				
Remove existing Knob & Tube wiring	1,980	SF	1.40	$2,772
Exterior porch				
Remove porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	10.00	$5,590
Remove porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	7.50	$4,193
Remove porch handrailing				
Replace horizontal log rails, 3 high at perimeter	107	LF	9.50	$1,017
Exterior wall repairs				
Remove lower 3 rows of logs to perimeter walls (Per level)	194	LF	25.00	$4,850
piecemeal method so deconstruct not required				
Replace additional 4' at ends of corner logs, staggered laps	256	LF	15.00	$3,840
Hazmat demolition				
Remove linoleum floor to Kitchen floor glue product	300	SF	7.50	$2,250
(Prior to renovating the cabin floor)				
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$24,512**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
ADA Improvements, S.W Corner (#10 page 18)				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	20,000.00	$20,000
Planting improvements	1	LS	5,000.00	$5,000
TOTAL - 112 SITE IMPROVEMENTS				**$35,000**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / re-run piping for water and sewer to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$215,896	$109.04
NET DIRECT BUILDING COST		$215,896	$109.04
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$21,590	$10.90
SUBTOTAL		$237,486	$119.94
INSURANCE	2.00%	$4,750	$2.40
SUBTOTAL		$242,235	$122.34
BONDS: CONTRACTOR	1.50%	$3,634	$1.84
TOTAL BUILDING COST		**$245,869**	**$124.18**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$215,896		$109.04
111 Site Preparation	$215,896		$109.04	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$215,896**		**$109.04**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	2,633	SF	2.00	$5,267
Remove doors, single	6	EA	100.00	$600
Remove roof sheathing	2,633	SF	2.00	$5,267
Demolish wood framed structure	1,980	SF	20.00	$39,600
Demolish flooring (Building and Decking)	3,840	SF	2.50	$9,600
Demolish sub floor framing with crawl space (Building and Decking)	3,840	SF	5.00	$19,200
Demolish concrete foundations to building (Minimal)	3,840	SF	2.50	$9,600
Demolish stone and masonry fireplace	720	SF	25.00	$18,000
Demolish concrete foundations to fireplace	1	LS	10,000.00	$10,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Dispose stone and masonry				
Move out of building, hand	27	CY	150.00	$4,000
Load trucks	27	CY	40.00	$1,067
Haul debris	27	CY	50.00	$1,333
Dispose/recycle debris	27	CY	30.00	$800
Dispose concrete (Foundations)				
Load trucks	53	CY	75.00	$3,956
Haul debris	53	CY	50.00	$2,637
Dispose/recycle debris	53	CY	25.00	$1,319
Remove wood				
Load wood debris in trucks	293	CY	15.00	$4,400
Haul wood in trucks	293	CY	30.00	$8,800
Dispose	293	CY	15.00	$4,400
Hazmat demolition				
Hazmat monitoring and clearance	300	SF	5.00	$1,500
Remove linoleum floor to Kitchen floor glue product (Prior to renovating the cabin floor)	300	SF	7.50	$2,250
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$215,896**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$56,128	$29.36
NET DIRECT BUILDING COST		$56,128	$29.36
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$5,613	$2.94
SUBTOTAL		$61,741	$32.29
INSURANCE	2.00%	$1,235	$0.65
SUBTOTAL		$62,976	$32.94
BONDS: CONTRACTOR	1.50%	$945	$0.49
TOTAL BUILDING COST		**$63,920**	**$33.43**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$56,128		$29.36
111 Site Preparation	$21,245		$11.11	
112 Site Improvements	$34,883		$18.24	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$56,128**		**$29.36**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$21,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	400	LF	67.42	$26,968
Add for barbed wire outrigger	400	LF	7.42	$2,967
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$34,883**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$3,500	$1.83
04 EXTERIOR CLOSURE		$41,380	$21.64
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$129,728	$67.85
NET DIRECT BUILDING COST		$174,608	$91.32
DESIGN CONTINGENCY	5.00%	$8,730	$4.57
SUBTOTAL		$183,338	$95.89
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$18,334	$9.59
SUBTOTAL		$201,672	$105.48
INSURANCE	2.00%	$4,033	$2.11
SUBTOTAL		$205,706	$107.59
BONDS: CONTRACTOR	1.50%	$3,086	$1.61
TOTAL BUILDING COST		**$208,791**	**$109.20**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$3,500		$1.83
031 Floor and Roof Construction	$3,500		$1.83	
032 Stair Construction				
04 EXTERIOR CLOSURE		$41,380		$21.64
041 Exterior Walls	$41,380		$21.64	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$129,728		$67.85
111 Site Preparation	$129,728		$67.85	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$174,608**		**$91.32**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Roof repairs				
Repair shed roof along south	1	LS	3,500.00	$3,500
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$3,500**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off doors, board up with plywood	112	SF	15.00	$1,680
Fill other miscellaneous openings and gaps	1,912	SF	2.50	$4,780
Rehab windows				
Repair window frames	80	LF	50.00	$4,000
Add / replace sills with stop and bead for new pane	80	LF	45.00	$3,600
Clear lexan view panel	258	SF	40.00	$10,320
Paint and seal window frames	80	LF	15.00	$1,200
Strengthening at exterior walls				
Wood bracing, 2x10 with screw fixings				
Interior face exterior wall (10 locations)	300	LF	30.00	$9,000
Fix bracing, screw connections (4 points per location)	10	EA	680.00	$6,800
TOTAL - 041 EXTERIOR WALLS				**$41,380**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				
Pressure treated wood box cribbing, 6x6 members				
Exterior, (av) 3' high, 2 blocks per lvl, 3' long(30EA)	25	EA	1,080.00	$27,000
Prepare grade and sub floor for cribbing	25	EA	420.00	$10,500
Interior, (av) 3' high, 2 blocks per lvl, 3' long(20EA)	20	EA	1,080.00	$21,600
Prepare grade and sub floor for cribbing	20	EA	420.00	$8,400
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Hazmat monitoring and clearance	1	LS	5,000.00	$5,000
Remove wallboard for bracing walls, Hazmat	1,000	SF	4.50	$4,500
Collate and dispose material	1,000	SF	1.50	$1,500
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Paint / encapsulation				
Encapsulate and paint the building exterior to match doors	2,256	SF	3.60	$8,122
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$129,728**

Maintenance costs:

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$53,644	$28.06
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$115,711	$60.52
04 EXTERIOR CLOSURE		$78,956	$41.29
05 ROOFING		$24,238	$12.68
06 INTERIOR CONSTRUCTION		$3,060	$1.60
07 CONVEYING			
08 MECHANICAL		$83,470	$43.66
09 ELECTRICAL		$42,960	$22.47
10 EQUIPMENT		$7,690	$4.02
11 SITEWORK		$125,210	$65.49
NET DIRECT BUILDING COST		$534,939	$279.78
DESIGN CONTINGENCY	5.00%	$26,747	$13.99
SUBTOTAL		$561,686	$293.77
ESCALATION TO MIDPOINT 01/2021	5.42%	$30,425	$15.91
SUBTOTAL		$592,111	$309.68
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$59,211	$30.97
SUBTOTAL		$651,322	$340.65
INSURANCE	2.00%	$13,026	$6.81
SUBTOTAL		$664,348	$347.46
BONDS: CONTRACTOR	1.50%	$9,965	$5.21
TOTAL BUILDING COST		**$674,313**	**$352.67**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$53,644		$28.06
011 Standard Foundations	$53,644		$28.06	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$115,711		$60.52
031 Floor and Roof Construction	$115,711		$60.52	
032 Stair Construction				
04 EXTERIOR CLOSURE		$78,956		$41.29
041 Exterior Walls	$78,956		$41.29	
042 Exterior Doors/Windows				
05 ROOFING		$24,238		$12.68
051 Roofing	$24,238		$12.68	
06 INTERIOR CONSTRUCTION		$3,060		$1.60
061 Partitions				
062 Interior Finishes	$3,060		$1.60	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$83,470		$43.66
081 Plumbing	$83,470		$43.66	
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$42,960		$22.47
091 Standard Electrical	$42,960		$22.47	
092 Special Electrical				
10 EQUIPMENT		$7,690		$4.02
101 Fixed/Movable Equipment				
102 Furnishings	$7,690		$4.02	
103 Special Construction				
11 SITEWORK		$125,210		$65.49
111 Site Preparation	$100,210		$52.41	
112 Site Improvements				
113 Site Utilities	$25,000		$13.08	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$534,939**		**$279.78**

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (184 LF)	20	CY	1,729.72	$35,363
Interior footing, 1.5' wide x 2' deep, hit and miss (40 LF)	4	CY	1,729.72	$7,688
Spread/pad footings under posts, 2'x2'x2.5' deep (20 EA)	7	CY	1,430.02	$10,593
TOTAL - 011 STANDARD FOUNDATIONS				**$53,644**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing				
Replace crawl space posts, 4x4x N.E 4' high	20	EA	400.00	$8,000
Exterior cripple wall - see Exterior walls				
Flooring				
Replace missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	22.50	$1,125
Steel frame clips to connect joists, girders and posts	20	EA	75.00	$1,500
Retrofit sister 2x8 joists ea side girders (double) @48" o.c	1,008	LF	25.00	$25,188
Premium to pre drill and screw sister joists (or bolt)	1,008	LF	7.50	$7,556
Exterior cripple wall - see Exterior walls				
Strengthening structure at walls				
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall) Allow 100LF	800	SF	15.00	$12,000
Plywood sheathing, 1/2"	800	SF	4.60	$3,680
Plywood shear nailing	800	SF	1.50	$1,200
HDU's, hold downs bolted to sub structure framing	20	EA	150.00	$3,000
Seismic anchors below wall into foundations	20	EA	350.00	$7,000
Roof framing				
Retrofit x2 Ridge beams, span between rafters	117	LF	50.00	$5,850
Connect hardware ends of ridge beams	59	EA	115.00	$6,785
Blocking between rafters, exterior perimeter walls	236	LF	17.50	$4,130
Blocking between rafters, interior walls	153	LF	17.50	$2,678
Retrofit collar ties to supplement existing	59	EA	77.50	$4,534
Roofing replacement work				
Replace part rafters, 2x8 Rafters@ 2'o.c (Allowance, 20%)	402	SF	29.50	$11,847
New roof sheathing, 5/8", pitched roof	2,008	SF	4.80	$9,638
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$115,711**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior walls				
Cripple wall retrofit work				
Stud framing, 2x4 @16" o.c (Cripple wall)	582	SF	15.00	$8,730

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Plywood sheathing, 1/2"	582	SF	4.60	$2,677
Sill/ bearer, 3x4 bolted to foundations, 24" o.c	200	LF	62.50	$12,500
New wood siding, 1x12 to match historical planks, cripple wall				
North elevation, N.E 3.5' high	224	SF	22.50	$5,040
East & West Elevation, N.E 2.5' high	230	SF	22.50	$5,175
South Elevation, N.E 2' high	128	SF	22.50	$2,880
HDU's, hold downs bolted to bearer, 4' o.c	50	EA	125.00	$6,250
Exterior wall cladding work				
Replace siding,1x12 salvaged old-growth redwood, Allowance	150	SF	35.00	$5,250
Check battens/ sub structure for status and report				
Rehab windows				
Repair window frames	138	LF	50.00	$6,900
Add / replace sills with stop and bead for new pane	138	LF	45.00	$6,210
Replace glass to windows	146	SF	30.00	$4,380
Paint and seal window frames	138	LF	15.00	$2,070
Rehab doors, restore to working condition with repair and paint				
Exterior	4	EA	750.00	$3,000
Interior, rooms	4	EA	400.00	$1,600
Interior, cupboards	2	EA	250.00	$500
Paint exterior				
Exterior wood cladding, prepare and paint	2,448	SF	2.37	$5,794
TOTAL - 041 EXTERIOR WALLS				**$78,956**
ELEMENT - ROOFING				
051 ROOFING				
Roof Replacement				
Asphalt shingles (standard strip shingles)	1,912	SF	4.87	$9,317
Adhered membrane	1,912	SF	1.72	$3,282
Rigid insulation, 2"	1,912	SF	2.77	$5,295
Flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	6.39	$747
Asphalt shingle valley flashing	25	LF	5.88	$147
Metal eave edge flashing	147	LF	23.47	$3,450
Raked metal roof end flashing	85	LF	23.47	$2,000
TOTAL - 051 ROOFING				**$24,238**
ELEMENT - INTERIOR CONSTRUCTION				
062 INTERIOR FINISHES				
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 062 INTERIOR FINISHES				**$3,060**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to swicthboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,912	SF	12.50	$23,900
Conduit and wiring	1,912	SF	5.00	$9,560

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 091 STANDARD ELECTRICAL				**$42,960**
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	10	LF	374.23	$3,742
Countertop, plastic laminate with backsplash	10	LF	114.50	$1,145
Wall cabinet, plastic laminate	10	LF	280.30	$2,803
TOTAL - 102 FURNISHINGS				**$7,690**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Demolition, piecemeal at building				
Remove roof shingles	1,912	SF	2.60	$4,971
Remove roof underlayment	1,912	SF	1.20	$2,294
Remove wood siding to replace, Allowance 150 sf	150	SF	5.00	$750
Remove flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	4.00	$468
Asphalt shingle valley flashing	25	LF	4.00	$100
Metal eave edge flashing	147	LF	6.00	$882
Raked metal roof end flashing	85	LF	6.50	$554
Sub floor framing repairs				
Remove crawl space posts, N.E 4' high	20	EA	390.00	$7,800
Remove sub floor exterior wall paneling	582	SF	12.50	$7,275
Flooring				
Remove missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	10.00	$500
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Roofing replacement work				
Remove damaged rafters, 2x8 Rafters @ 2' o.c, sloped (Allowance,	402	SF	12.50	$5,020
Remove roof sheathing, 5/8", pitched roof	2,008	SF	2.40	$4,819
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Hazmat341 monioring and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	1.50	$5,550
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$100,210**
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / correct piping into site to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$204,845	$107.14
NET DIRECT BUILDING COST		$204,845	$107.14
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$20,485	$10.71
SUBTOTAL		$225,330	$117.85
INSURANCE	2.00%	$4,507	$2.36
SUBTOTAL		$229,836	$120.21
BONDS: CONTRACTOR	1.50%	$3,448	$1.80
TOTAL BUILDING COST		**$233,284**	**$122.01**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$204,845		$107.14
111 Site Preparation	$204,845		$107.14	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$204,845**		**$107.14**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,912	SF	2.00	$3,824
Remove metal flashings	232	LF	5.00	$1,160
Remove exterior siding	2,472	SF	5.00	$12,360
Remove doors, single	12	EA	100.00	$1,200
Remove roof sheathing	1,912	SF	2.00	$3,824
Demolish wood framed structure	1,912	SF	15.00	$28,680
Demolish flooring	1,912	SF	2.00	$3,824
Demolish sub floor framing	1,912	SF	3.50	$6,692
Remove dead tree	2	EA	2,000.00	$4,000
Remove large trees hanging over property	2	EA	2,000.00	$4,000
Recycle wood				
Load wood debris in trucks	212	CY	25.00	$5,311
Haul wood in trucks	212	CY	50.00	$10,622
Dispose/recycle wood	212	CY	35.00	$7,436
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Consultant monitoring, inspections and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	0.75	$2,775
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	15,000.00	$15,000
TOTAL - 111 SITE PREPARATION				**$204,845**

ZFA STRUCTURAL ENGINEERS

WHITE (DYER) BARN

Structure Stabilization Basis of Design

Midpeninsula Regional Open Space District
La Honda Creek Open Space Preserve, San Mateo County, California
District Project Number: MAA05-008

March 13, 2020

Prepared For:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Prepared By:

Steven Patton, SE, Senior Associate
Matt Frantz, SE, Associate Principal
Mark Moore, SE, Principal-in-Charge

TABLE OF CONTENTS

EXHIBITS

Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
Exhibit C: *Geotechnical Investigation* by Romig Engineers
Exhibit D: *Asbestos and Lead Survey* by Terracon Consultants, Inc.
Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
Exhibit F: *Topographic Site Plan* by Sigma Prime Geosciences, Inc.
Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
Exhibit H: *Conceptual Cost Estimate* by OCMI

BASIS OF DESIGN SUMMARY

Introduction

The White Barn (also referred to as the Dyer Barn) is located on a moderately sloping site off Allen Road in the La Honda Creek Open Space Preserve and is owned by Midpeninsula Regional Open Space District (District). The White Barn is a rectangular wood-framed structure that was part of a working farmstead from the 1860s until 1973. The original construction date is unknown, but the District estimates that it was constructed before 1860 and was partially rebuilt after 1900.

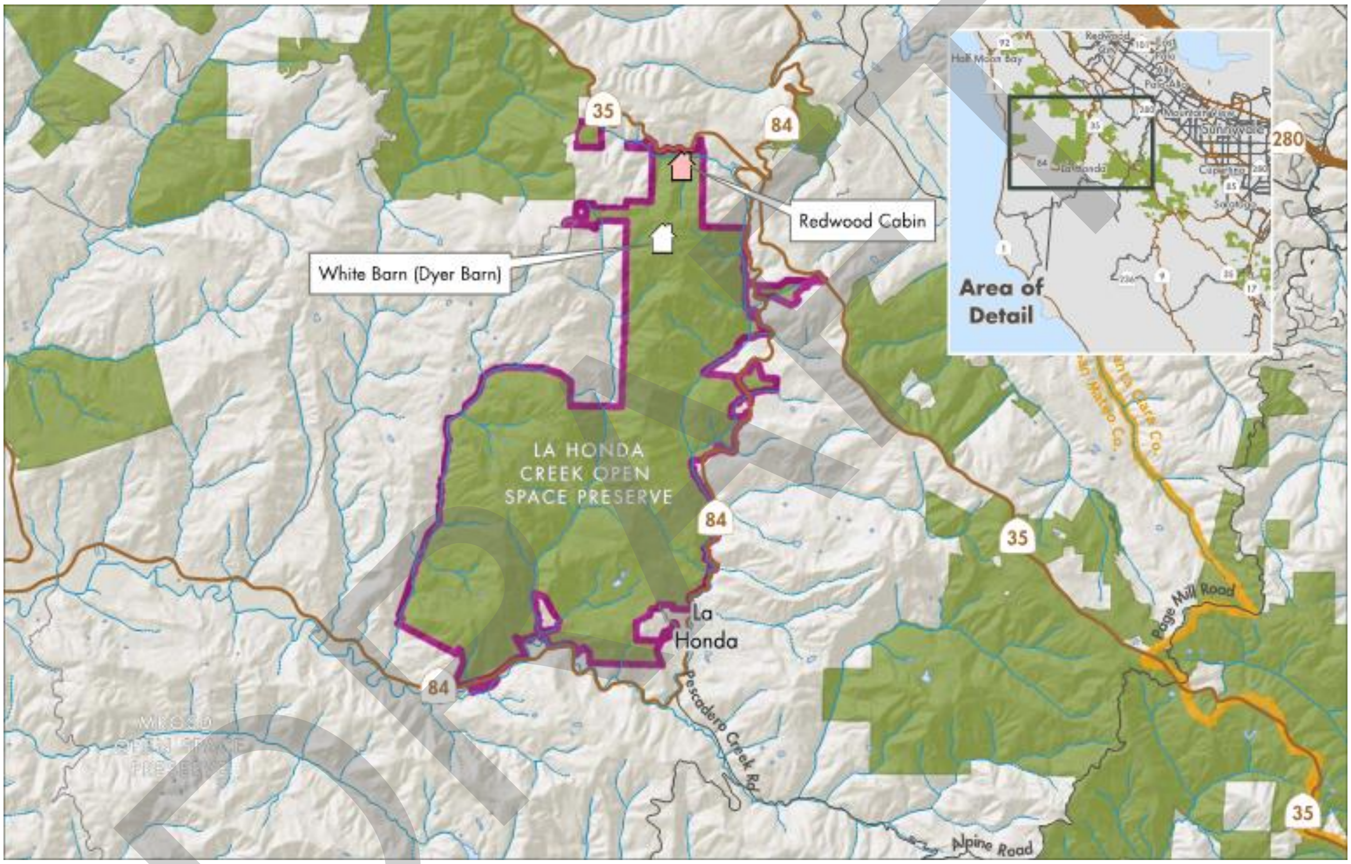


Figure 1. Project Area Map

The exterior of the structure contains vertical redwood boards and doors on each façade. The primary structure is hand-hewn timber post and beam framing that is supported by a redwood beam foundation. The gable roof is comprised of skip sheathing supporting rusted, corrugated metal roofing. The District purchased this property in 1984 and the structure has been uninhabited under the District's ownership. The building is eligible for individual inclusion in the National Register and California Register of Historic Places and qualifies as a historical resource. The lack of use and years of deferred maintenance have left the White Barn in poor condition.

The District has initiated a project to assess the structure of the White Barn, along with the La Honda Creek Redwood Cabin and Beatty Property Home. The project is being performed in two phases:

- Phase 1: Site reconnaissance and structure assessment
- Phase 2: Improvement selection and construction documents

This report summarizes the findings and recommendations from the Phase 1 tasks including an assessment of the existing conditions, Basis of Design, conceptual design alternatives, and cost estimates. The proposed alternatives include:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a storage facility for District use.
4. **Remove the structure** and restore the underlying natural resource values

Each alternative can include interpretive signage if or once the site is accessible to the public.

Consultants and Exhibits

The findings and recommendations contained in this summary are based on the following reports, which are provided as Exhibits:

- Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
- Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
- Exhibit C: *Geotechnical Investigation* by Romig Engineers
- Exhibit D: *Asbestos and Lead Survey* by Terracon Consultants, Inc.
- Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
- Exhibit F: *Topographic Site Plan* by Sigma Prime Geosciences, Inc.
- Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
- Exhibit H: *Conceptual Cost Estimate* by OCMI

Permitting Agency

The permitting agency for this building is the County of San Mateo Planning and Building Department (County). A preliminary coordination meeting was performed with the County to discuss the project. The County requested that a follow-up meeting be held once an option is selected by the District. In addition, the County of San Mateo Historic Resource Planner stated that the proposed option must be reviewed and approved by the County's Historic Resources Advisory Board (HRAB). The County did not provide definitive guidance on the permitting schedule as this is dependent on the selected option, but the permitting and review schedule is expected to increase along with the scope of rehabilitation. For instance, the County stated that installation of a fence could likely be approved with an over-the-counter review, whereas rehabilitation for occupancy of the interior of the building would require a formal submittal review process. Demolition of the building or any significant alterations to the historic fabric would require greater review time by the HRAB.

Regulatory Requirements

The following regulatory contexts, summarized here from Exhibit A, were investigated and considered for this building:

- National Register of Historic Places
    - The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Based on a previous assessment, the White Barn was determined to be eligible for the National Register.

- California Register of Historic Resources
  - The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Based on a previous assessment, the White Barn was determined to be eligible for the California Register.
- Secretary of The Interior's Standards
  - *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Standards*) establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The *Standards* and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources.

Governing Building Code

Since the building is eligible for the National and California Registers, the *California Historical Building Code* (Part 8 of the California Code of Regulations, Title 24) is the governing building code. As discussed in Exhibit A, the code provides performance-oriented rather than prescriptive provisions for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources. The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all.

Architectural Condition Assessment

The results of the architectural conditions assessment, detailed in Exhibit A, are summarized below.

Windows

All exterior windows have been boarded up from the exterior and are now only visible from the interior. The sash observed were in generally fair to poor condition as none retains the original glazing and framing is somewhat weathered and deteriorated.

Exterior Doors

There are four doors to the Barn, made of wood boards of similar characteristics to the boards used for the façades. Several of the boards are displaced in the vertical direction, giving an overall feeling of being out of square with the façade openings. In general, they are in fair to poor condition showing heavy weathering and exposure to the elements, even though still operable with some difficulty.

Exterior Wood Cladding

The exterior board-and-batten siding is in fair to poor condition. Many of the battens have collapsed or are missing, leaving the joints of the vertical boards open with varying gaps between them, which allows the intrusion of small animals, insects, water and humidity, and direct sun into the building, reducing its sheltering effect of the building interiors. The boards show a high degree of weathering from exposure to the elements. In some cases, the bottom of the boards has rotted away completely and no longer covers the grade beams.

Foundations

The foundation of this building is made of wood grade beams sitting on or partially buried in the ground, making it vulnerable to moisture from the ground, animals, and insects. Where the foundation beams were visible at the building perimeter, they are in very poor condition, being spongy and brittle to the touch; the condition of intermediate foundation beams could not be visually assessed.

Corrugated Metal Roof

It is assumed that the existing galvanized, corrugated metal roof is a non-original replacement for the original roofing, however no remnants of earlier roofing were observed during the site visit. The corrugated metal roofing exhibits some surface corrosion, but generally appears to be sound. Interior observations indicate that the panels may not be lapped properly which allows water to enter the building.

Interior Floors

The wood floorboards display signs of heavy use, discoloring and partial loss of mass along the edges next to the façade cladding. Some areas have been affected by termites and other insect attacks. Several floorboards are loose, and do not appear to be attached to the framing below, which creates a condition for unstable footing when walking inside the building.

Interior Wood Feeding Crib, Pen and Partitions

These partitions are formed by wood boards nailed to the main structure supports and some secondary posts mounted directly over the floorboards. They are in generally fair condition. Several pieces have biological growth where exposed to the elements, and some show signs of insect damage.

Roof Framing

The roof framing appears to represent a few different eras of construction. The roof framing appears to be in generally good condition, with the exception of the exposed rafter tails, which are in generally fair condition, where the wood is splitting and beginning to check in some locations. However, no significant deterioration or loss of profile was observed.

Post and Beam Framing

The main supporting structure is made of hand-hewn single pieces of redwood. All the main frame elements are in good condition, showing only minor signs of decoloring and humidity near the base of the posts, where they are in direct contact with the foundations.

Structural Condition Assessment

The results of the structural condition assessment are detailed in the report in Exhibit B. The structural assessment includes a review of the existing materials conditions as well as the expected performance of the structure under seismic and gravity loading.

Overview

The structure above grade appears to be in generally fair to good structural condition for the era of construction. The base of the structure in contact with soil appears to be in poor condition with obvious structural damage and deterioration apparent.

Roof Framing

The roof is composed of corrugated metal sheathing that is supported by 1x6 skip sheathing spanning between 2x6 rafters spaced at 3 feet on center. The roof framing, viewed from the ground, appeared to be generally in good condition. Some localized deterioration due to weather ingress is assumed because of gaps observed in the corrugated metal roofing.

Post and Beam Framing

The primary structure is comprised of a timber post and beam system with 8x8 posts at 8 feet on center along the north and south ends of the building, as well as along the center of the building below the ridge. These posts support 8x8 beams, which in turn support the roof rafters. The timber framing was observed to be in generally good condition.

Walls

Walls are comprised of 1x vertical board and batten siding, which is generally in fair to poor condition with obvious signs of deterioration due to weather exposure particularly at the bottom of the walls adjacent to soil. Battens are also missing in many locations and the walls do not provide a waterproof or pest resistant façade for the interior of the structure.

Floor Framing

At the ground floor level, the flooring is composed of 2x straight sheathing that is assumed to be supported by wood floor framing. The floor sheathing is in fair to poor condition with deterioration observed at some locations, particularly at the perimeter of the building. The floor framing sits just above or directly on the soil, so there is no access to observe the condition or type of framing. Deterioration due to soil contact is assumed in the floor framing throughout.

Foundations

The foundations for this structure are limited to wood grade beams placed directly on the soil. This wood has significantly deteriorated and contributed to settlement of the structure over time.

Seismic Force-Resisting System

The building generally lacks a seismic force-resisting system. De-facto lateral resistance is provided by the knee braces in the post and beam system, although this provides limited strength and ductility and is inadequate to resist the significant seismic forces that may occur at this site. The corrugated metal roofing serves as the de-facto roof diaphragm. A Tier 1 assessment of the structure using ASCE 41-17 *Seismic Evaluation and Retrofit of Existing Buildings* identified a number of potential deficiencies including the lack of a complete and well-defined seismic force-resisting system and the lack of steel hardware at post to beam connections. The structure is expected to perform poorly during a significant earthquake.

Geotechnical Investigation

A geotechnical investigation report has been prepared by Romig Engineers, which is in Exhibit C. Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- The depth to competent bearing material appears to vary from the surface at the north side to up to 6 feet below ground surface at the south side. Foundations are recommended to extend down to competent bearing material to reduce the potential for differential settlement, or deepened excavations could be backfilled with compacted fill or lean concrete cement slurry (page 7).
- The preliminary Hazard Zone Map indicates that the site is located in an area that is potentially susceptible to earthquake-induced landslides. However, it appears that the mapping is associated with the steep slopes in the general site vicinity, rather than the slopes in the immediate vicinity of the barn, and no obvious indications of slope instability immediately surrounding the barn were observed (page 4).
- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 7).

The bottom of all footing excavations should be cleaned of loose, soft, overly moist or collapsible soil and debris. A member of the geotechnical engineer's staff should observe the excavations to confirm that they have at least the minimum recommended dimensions, are founded in competent residual soil or bedrock, and have been properly cleaned prior to placing concrete forms and reinforcing steel. If existing fill soil, colluvial soil, or disturbed bedrock is encountered at the foundation bearing depth, the geotechnical field representative will require these materials to be removed and a deeper embedment depth provided before reinforcing steel and concrete is placed.

Hazardous Materials Survey

An Asbestos and Lead Survey was performed by Terracon, which is documented in the report in Exhibit D. In summary, no asbestos containing materials were detected in the tested materials. Lead based paint was confirmed in the building and is the only hazardous material identified. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. If loose and/or peeling paint is disturbed, it is required to be mitigated.

Archaeological Survey

An archaeological survey is not required for all Alternatives and was therefore not included in this Assessment. An archaeological survey would only be performed for Alternatives 3 and 4. Should these options be selected, the survey would be performed concurrent with the documentation for that phase.

Arborist Report

An arborist's report was not required for this building, since there are no trees in the immediate vicinity of the building.

Wildlife Survey

A wildlife survey was performed by Swaim Biological, Incorporated, on June 17, 2019, which is in Exhibit E, to identify special status mammal species in and around the building. Suitable bat roost habitat is present within the structure and moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat. Based on the observed presence of at least three bats roosting within the structure, this site is presumed to be serving as a maternity roost. No signs of woodrats were present in the structure or surrounding natural habitat. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

Recommendations to address the presence of wildlife include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1 of SBI's report. The bat wintering period is generally from November 16 through February 15, no building or tree work should be conducted during this time if bats are present.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- The need for replacement habitat due to impacts on the maternity roost per District guidelines is dependent upon whether the planned stabilization activities will eliminate roosting habitat. Determination of the need for replacement habitat plan should coincide with the development of the deterrent plan.
- Nesting bird surveys are required if work takes place between February 15 and August 30.

Site Access Constraints

The following items were considered when developing cost estimates for BOD options and should be considered for future planning of repairs and maintenance for the White Barn:

- Wildlife Habitat – The presence of protected species in the area requires that personnel and visitors to the site follow District guidelines and advisory documents for access. District access permits are required for this site. Bird nesting season is February 15 to August 30. Bat maternity season is from April 15 to August 31. Torpor season is from November 15 to February 15. Construction restrictions will be in effect for these times. A biological monitor is required to be present during the first phases of construction or demolition to ensure bats are not harmed. Exclusion may also be warranted depending on the type of work taking place.

Design Alternatives

To provide long-term stability of the structure and safety of the public and District staff, we recommend implementation of one of the following alternatives.

Four alternatives are explored to address the existing condition of the structure, which range from minimal work with restricted public access to a complete rehabilitation to allow for re-occupancy. Demolition is also explored as an option. Cost estimates have been developed for each option to assist the District with decision making.

Alternative 1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

Recommendations:

- Install a secure chain-link fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.
- Weed abatement at perimeter.
- Additional factors may need to be considered regarding the recommended lifespan of this option.

The estimated cost for Alternative 1 is **$39,004**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit H. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

Recommendations:

- Install pressure treated blocking/shims at locations of deteriorated wood grade beams to prevent further settlement of the superstructure and deterioration of the foundation.
- Provide wood cross bracing at the interior of exterior walls.
- The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.
- Follow the *Mothballing Guidelines* outlined in Exhibit G, including:
    a. Secure the building and its component features to reduce vandalism or break-ins.
    b. Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
    c. Provide adequate ventilation to the interior.
    d. Develop and implement a maintenance and monitoring plan for protection.
- Secretary of the Interior's *Standards* are the most appropriate basis for this proposed project alternative.
- Weed abatement at perimeter.
- Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements. Fenestration that is currently boarded-up from the exterior should be repaired, and openings covered with clear Lexan to allow for viewing of the historic interior. The non-historic plywood should also be removed.

- Remove peeling, loose lead-containing paint from the exterior of the Barn. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to protect the historic redwood cladding from the elements. The preparation of the substrate for painting should be gentle, it is not recommended that the existing texture of the wood be significantly altered. The condition of the coating should be inspected annually, and the building will likely require repainting every 7-10 years to maintain a sound coating on the wood.
- Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Alternative 2 is **$116,423**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit H. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 3: Repair and rehabilitate the structure for reuse as a storage facility for District use. The California Historic Building Code (CHBC) would be utilized to define the design criteria.

Recommendations:

- The stabilization methods proposed for this option target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code to allow for re-occupancy of the existing building. It is assumed there is no change of occupancy from the existing.
- Provide new structural members including:
  - New concrete foundation
  - New vertical seismic force-resisting system
  - New roof diaphragm
  - Remove and replace deteriorated siding (assume 40% require repair).
  - New floor system
- Secretary of the Interior's *Standards* are the most appropriate basis for this proposed project alternative.
- In addition to the envelope repair described in proposed project alternative #2 for the Barn, rehabilitating the building for a storage use should include the installation of interior lighting to meet code required minimums for safety.
- Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.
- Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Given the wooden construction of the building, it would be inadvisable to store any flammable materials within the barn, or any items that would increase the risk of fire or damage to the historic resource.
- Care should be taken to protect the door framing from impact damage; install temporary protection if necessary, in a manner that does not attach directly to or otherwise damage the historic fabric of the barn.

- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Alternative 3 is **$396,904**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit H. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 4: Remove the structure and restore the underlying natural resource values.

Recommendations:

- Demolishing the structure may require additional processes to obtain demolition permits.
- Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.
- Develop a replacement bat maternity roost habitat plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.
- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site should also be considered.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.
- Due to the relatively small size of the structure, the District may consider dismantling and relocating the structure as an alternative to demolition.

The estimated cost for Alternative 4 is **$171,982**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit H.

EXHIBIT A

Architectural Basis of Design and Alternative Evaluations

By Page & Turnbull, Inc.

TABLE OF CONTENTS

INTRODUCTION

The purpose of this section of the Basis of Design report is to evaluate the existing architectural conditions and the potential impacts and implications of four proposed project alternatives/treatments for the White (Dyer) Barn in the La Honda Creek Open Space Preserve. The four proposed project alternatives/treatments are as follows:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a storage facility for District Use
4. **Remove the structure** and restore the underlying natural resource values.

METHODOLOGY

To evaluate the existing conditions of the three subject buildings, Page & Turnbull conducted visual conditions assessments and documented the existing conditions with digital photography. The conditions were evaluated based on the following rating system of good, fair, and poor conditions:

Good (G)
The building element / feature is intact, structurally sound, and performing its intended purpose. The element / feature needs no repair or rehabilitation, but only routine or preventative maintenance.

Fair (F)
The building element / feature shows signs of aging and one or more of the following conditions is present:
a) There are early signs of wear, failure, or deterioration though the element / feature and its components are generally structurally sound and performing their intended purpose; or
b) There is failure of one individual component.

Poor (P)
The building element / feature shows signs of deterioration and one or more the following conditions is present:
a) The element / feature is no longer performing its intended purpose; or
b) Feature is missing; or
c) Deterioration or damage affects more than 30% of the element / feature; or
d) The element / feature shows signs of imminent failure or breakdown.

Unknown (U)
The element / feature was not accessible for assessment or not enough information is available to make an evaluation.

Evaluation of the proposed project alternatives took into account the historic significance of the La Honda Creek White Barn, and the applicable preservation principles and context, including the Secretary of the Interior's Standards for the Treatment of Historic Properties, the 2016 California Building Code, the 2016 California Existing Building Code, and the 2016 California Historical Building Code.

Evaluation of the structural conditions and recommendations for the remediation of structural deficiencies was performed by ZFA. Refer to the assessment report and treatment recommendations produced by ZFA for all structural considerations and impacts.

GUIDING PRESERVATION PRINCIPLES AND CONTEXT

The following section describes the various preservation principles and context that are applicable to the La Honda Creek White Barn. For analysis and considerations related to the California Environmental Quality Act (CEQA) as it may apply to the proposed project alternatives, additional studies may need to be performed.

THE NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Typically, resources over fifty years of age are eligible for listing in the National Register if they meet any one of the four criteria of significance and if they sufficiently retain historic integrity. However, resources under fifty years of age can be determined eligible if it can be demonstrated that they are of "exceptional importance," or if they are contributors to a potential historic district. National Register criteria are defined in depth in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*. There are four basic criteria under which a structure, site, building, district, or object can be considered eligible for listing in the National Register.

Criteria

Criterion A (Event): Properties associated with events that have made a significant contribution to the broad patterns of our history;

Criterion B (Person): Properties associated with the lives of persons significant in our past;

Criterion C (Design/Construction): Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components lack individual distinction; and

Criterion D (Information Potential): Properties that have yielded, or may be likely to yield, information important in prehistory or history.

Integrity

Once a resource has been identified as being potentially eligible for listing in the National Register, its historic integrity must be evaluated. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity. These aspects are location, design, setting, materials, workmanship, feeling and association.

Location is the place where the historic property was constructed or the place where the historic event occurred;

Setting addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s);

Design is the combination of elements that create the form, plan, space, structure, and style of the property;

Materials refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form the historic property;

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;

Feeling is the property's expression of the aesthetic or historic sense of a particular period of time; and

Association is the direct link between an important historic event or person and the historic property.

In order to be determined eligible for listing, these aspects must closely relate to the resource's significance and must be intact.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places.

In order for a property to be eligible for listing in the California Register, it must be found significant under one or more of the following criteria.

Criteria

Criterion 1 (Events): Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2 (Persons): Resources that are associated with the lives of persons important to local, California, or national history.

Criterion 3 (Architecture): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

Criterion 4 (Information Potential): Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

Resources eligible for the National Register are automatically listed in the California Register of Historical Resources.

Integrity

The process of determining integrity is similar for both the California Register and the National Register. The same seven variables or aspects that define integrity—location, design, setting, materials, workmanship, feeling and association—are used to evaluate a resource's eligibility for listing in the California Register and the National Register. There is a critical distinction between the two registers, however, and that is the degree of integrity that a property can retain and still be considered eligible for listing. According to the California Office of Historic Preservation:

It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the National Register, but they may still be eligible for listing in the California Register. A resource that has lost its

historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant or historical information or specific data.[1]

SECRETARY OF THE INTERIOR'S STANDARDS

The Secretary of the Interior's Standards for the Treatment of Historic Properties (hereafter "*Standards*") establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The Standards and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources. The *Standards* define four approaches to the treatment of historic properties, adapted below. A variety of factors contribute to the selection of an appropriate treatment, including the historic significance, physical condition, proposed use, and intended interpretation of the subject properties.

Preservation:

Focuses on the maintenance and repair of existing historic materials. Requires retention of the greatest amount of historic fabric, along with the building's historic form, features, and detailing as they have evolved over time. When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment.

Rehabilitation:

Acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character. When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment.

Restoration:

Allow for the depiction of a building at a particular time in its history by preserving materials from the period of significance and removing materials from other periods. When the property's design, architectural, or historical significance during a particular period of time outweighs the potential loss of extant materials, features, spaces, and finishes that characterize other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned, Restoration may be considered as a treatment.

Reconstruction:

Establish a limited framework for re-creating a vanished or non-surviving building with new materials, primarily for interpretive purposes. When a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction, Reconstruction may be considered as a treatment.

Once a treatment option has been established, an associated set of standards are applied. In addition to the *Standards*, the Secretary of the Interior publishes guidelines with specific examples to aid in interpreting how the standards are applied. For the purposes of this Basis of Design, the treatment approaches most appropriate to the four proposed project alternatives are Preservation and Rehabilitation.

---

[1] California Office of Historic Preservation, *Technical Assistance Series No. 6, California Register and National Register: A Comparison* (Sacramento, CA: California Office of State Publishing, November 2004)

Standards for Preservation:

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standards for Rehabilitation*

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

*For the *Historic Preservation Tax Incentives Program*, there is a similar but distinct set of standards.

Further discussion of the appropriate treatment options for the La Honda Creek White Barn can be found in the following sections of this Basis of Design Report.

CALIFORNIA HISTORICAL BUILDING CODE

The California Historical Building Code is Part 8 of the California Building Standards Code (California Code of Regulations, Title 24). The code provides performance-oriented rather than prescriptive provisions for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources.[2] The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all. From Section 8-101.2, Purpose:

> *The purpose of the CHBC is to provide regulations for the preservation, restoration, rehabilitation, relocation, or reconstruction of buildings or properties designated as qualified historical buildings or properties (Chapter 8-2). The CHBC is intended to provide solutions for the preservation of qualified historical buildings or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to preservation, and to provide for the reasonable safety of the occupants or users. The CHBC requires enforcing agencies to accept solutions that are reasonably equivalent to the regular code (as defined in Chapter 8-2) when dealing with qualified historical buildings or properties.*

Generally, qualified historical buildings may continue to be used as they were historically unless the continued use or occupancy constitutes a distinct hazard to life safety as defined in the CHBC.[3] For a change in occupancy, e.g. in the case of a rehabilitation or adaptive use, the property may need to be adapted to conform with the applicable requirements of its new use as defined in the CHBC.[4] The White Barn has been determined to be an historic resource; see the Current Historic Status section in the continuation of this report for further information.

CALIFORNIA EXISTING BUILDING CODE

For existing buildings not designated as historic resources, the provisions of the California Existing Building Code (CEBC) apply to their repair, alteration, change of occupancy, addition, and relocation.[5] Per the 2016 CEBC, Section 101.3, the intent of the code is to "provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition, and relocation of existing buildings." The White Barn is an historic resource, but the CEBC may still be applied by the Authority Having Jurisdiction where applicable.

[2] California Historical Building Code, 2016, vii.
[3] 2016 California Historical Building Code, Section 8-102.1.4.
[4] 2016 California Historical Building Code, Section 8-302.2.
[5] 2016 California Existing Building Code, Section 101.2

LA HONDA CREEK WHITE (DYER) BARN

CURRENT HISTORIC STATUS

The La Honda Creek White Barn (Barn), also known as the Dyer Barn, was evaluated for eligibility for inclusion in the National Register of Historic Places and the California Register of Historical Resources in an Historical Resource Evaluation (HRE) prepared by LSA in February 2018. The HRE found that the Barn appears eligible for individual listing in both the National Register and the California Register under several different significance criteria.

Under Criterion A of the National Register and Criterion 1 of the California Register, the Barn was found significant for its association with the early agricultural land use and development of San Mateo County in the mid-19th through the mid-20th centuries.[6] Under Criterion C of the National Register and Criterion 3 of the California Register, the Barn was found significant as a representative example of a Vernacular utilitarian building type associated with the mid-19th century agricultural development of San Mateo County and California.[7] And finally, under Criterion D of the National Register and Criterion 4 of the California Register, the Barn was found significant for its representation of and potential to yield further information about a local building tradition and joinery technology with labor-intensive craftsmanship, and the use of local redwood in its period of construction.[8]

CHARACTER-DEFINING FEATURES

Exterior

- The siting of the Barn in a sparsely developed area that still conveys its rural history and association.
- Use of simple, utilitarian, and primarily local construction materials
- Medium-pitched gable roof.
- Simple, rectangular form and plan.
- Vertical board-and-batten redwood siding
- Board-and-batten clad doors.
- Variety of utilitarian fenestration associated with agricultural use

Interior

- Hand-hewn redwood post-and-beam construction.
- Largely open volume from the floor to the roof framing without internal horizontal structural members.
- Simple, wide-plank wood floors

PERMITTING AGENCY – AUTHORITY HAVING JURISDICTION

The Barn is located in San Mateo County within a Resource Management zone. The authority having jurisdiction for environmental approvals including the issuance of planning approvals and building permits is the County of San Mateo Department of Planning and Building Department. Permitted uses within the Resource Management Zone include the following:

- Agricultural uses and accessory structures, on-site sales of agricultural products.
- Nurseries and greenhouses
- Temporary trailer parks and other housing for farm laborers
- Livestock raising and grazing

---

[6] LSA *Historical Resource Evaluation of the Dyer Barn,* 2018, page 30.
[7] Ibid, page 31.
[8] Ibid, page 32.

- Dairies
- Kennels or Catteries
- Timber Harvesting (see zoning code for specifications)
- Quarries and waste disposal
- Single-family residences
- Public and private clubs
- Public recreation
- Commercial recreation

EXISTING CONDITIONS ASSESSMENT

On July 10th, 2019 Page & Turnbull performed a visual conditions assessment of the exterior and interior of the White Barn (Barn), located at the end of Kebet Ridge Road, Redwood City, approximately 1.5 miles to the east of the intersection of Bear Gulch Road and Allen Road. It was built circa 1860 and it currently shares an open sloping hillside site with two contemporary buildings belonging to the La Honda Creek Preserve, which is operated by the Midpeninsula Regional Open Space District. The site is generally characterized by rolling grassland bound by wooded areas. The Barn stands at an elevation below the contemporary structures at the toe of a hill on a narrow flat section. The hillside continues to fall away from the barn's South face into a heavily wooded ravine. Conditions were examined from ground level for the building exteriors and interiors. For the assessment of structural conditions, please see the report produced by ZFA.

The conditions assessment investigated the following exterior building elements:

- Wood
  - Windows,
  - Doors,
  - Exterior wood cladding,
  - Foundations,
  - Roof framing,
- Metal elements
  - Corrugated metal roof,
  - Hinges, latches and miscellaneous elements.
- Landscape
  - Surrounding hill slopes and possible affectation from natural rain water draining around the base of the building,

The interior building elements investigated were the following:

- Wood
  - Floors,
  - Interior wood feeding crib, pen and partitions,
  - Roof framing,
  - Post and beam framing.

Interiors were evaluated for the possible presence of protected animal species residing in the building, none of which were observed during this inspection.

An analysis of specific code deficiencies for occupancy was not conducted, however general code considerations related to the four proposed project alternatives will be discussed as applicable.

Previous documentation provided to the Page & Turnbull team is listed below. The Conditions Assessment and Recommendations Report by Interactive Resources, Inc. provides a number of exterior and interior stabilization recommendations related to the structural stability and material maintenance of the building. It is Page & Turnbull's understanding that none of the recommended interventions have occurred, and we therefore may reiterate the need for many of them.

- Conditions Assessment and Recommendations Report, by Interactive Resources, Inc. (11/30/2017).
- Historical Resource Evaluation of the Dyer Barn, by LSA (02/06/2018).

While the scope of this report does not include the preparation of restoration documents or specific recommendations for repairs, any costing of such work should consider that the work is to be performed in accordance with the Secretary of Interiors Standards for Rehabilitation which indicate the following hierarchy: protect and retain, repair, or replace in-kind (if deteriorated beyond repair).

Exterior

Windows

All exterior windows have been boarded up from the exterior and are now only visible from the interior. The sash observed were in generally fair to poor condition as none retains the original glazing and framing is somewhat weathered and deteriorated. The windows to the east façade are single sash six-lite windows. There is also an open panel on the south façade covered by a sliding panel which slides on wooden tracks.

Doors

There are four doors to the Barn, made of wood boards of similar characteristics to the boards used for the façades, two symmetrical on the east façade and the two others on the south and west façade near that corner of the building. The boards of the doors are nailed on the inside to a wood formed "Z" shape support on which the hinges are attached. Several of the boards are displaced in the vertical direction, giving an overall feeling of being out of square with the façade openings. In general they are in fair to poor condition showing heavy weathering and exposure to the elements, even though still operable with some difficulty. The door hinges are attached to the wood using highly rusted square headed nuts and bolts.

Exterior Wood Cladding

The exterior board-and-batten siding is in fair to poor condition. Many of the battens have collapsed or are missing, leaving only remnants and traces to indicate their prior size and position. The missing battens leave the joints of the vertical boards open with varying gaps between them, which allows the intrusion of small animals, insects, water and humidity, and direct sun into the building, reducing its sheltering effect of the building interiors. The boards show a high degree of weathering from exposure to the elements, warping lengthwise in most cases, which widens the gaps separating them. Some boards have partially collapsed or are missing along the façades. The boards display a greater degree of deterioration due to moisture toward the bottom of the boards; in some cases the bottom of the boards has rotted away completely and no longer covers the grade beams. Most boards display diverse degrees of weathering and biological growth, especially along the sides where battens are missing. Some of the boards bear evidence of termite and other insect attacks. UV damage is greatest on the west and south façades of the Barn, and appeared to be at least 1/8-inch deep in some areas.

Foundations

The foundation of this building is made of wood grade beams sitting on or partially buried in the ground, making it vulnerable to moisture from the ground, animals, and insects. Where the foundation beams were visible at the building perimeter, they are in very poor condition, being spongy and brittle to the touch; the condition of intermediate foundation beams could not be visually assessed.

Corrugated Metal Roof

It is assumed that the existing galvanized, corrugated metal roof is a non-original replacement for the original roofing, however no remnants of earlier roofing were observed during the site visit. The corrugated metal roofing exhibits some surface corrosion, but generally appears to be sound. Interior observations indicate that the panels may not be lapped properly within the rows of roofing, as the joints between them show diffused light coming through in bright conditions. If light is getting through, then water likely is too to some degree.

Hinges, Latches and Miscellaneous Elements

Most of the other metal elements, such as hinges, nuts and bolts, and latches, although rusted in all their surface, appear not to be severely damaged, being in fairly good conditions and working properly. Rehabilitation would require removing and treating the existing corrosion, applying a corrosion-inhibiting coating, and oiling the hardware as required for proper operation.

Site

The barn is sited within the slope of a hill such that the land slopes toward the building on the north side and down from the building on the south side while being roughly level to the east and west. The primary approach to the building is from the east. With water from the northern portion of the site draining toward the building's north side, combined with the greater shading from the sun on the north side, it is not surprising that the greatest deterioration and loss of historic fabric due to moisture was observed on the north side of the building at or near the ground.

Interior

Floors

The wood floor boards display signs of heavy use, discoloring and partial loss of mass along the edges next to the façade cladding. Some areas have been affected by termites and other insect attacks and have biological growth, especially next to the cladding openings where boards are missing. Several floorboards are loose, and do not appear to be attached to the framing below, which creates a condition for unstable footing when walking inside the building.

Interior Wood Feeding Crib, Pen and Partitions

These partitions formed by wood boards nailed to the main structure supports and some secondary posts mounted directly over the floorboards. They are in generally fair condition for structures that were utilitarian in their original construction. In some areas the boards have split or become displaced, but otherwise the material is generally sound. Several pieces have biological growth where exposed the to the elements, and some show signs of insect damage.

Roof framing

The roof framing appears to represent a few different eras of construction. The ridge beam is supported by tall, hand-hewn redwood posts that and appear to be original, and are mortise and tenon jointed to the beam. The ridge beam, rafters, and purlins all appear to be machine-milled, and may be a later replacement for the original roof framing. The rafters lap each other over the ridge beam instead of being mitered and, form a 90-degree gable. Toe-nailed knee bracing is extant between the center posts and ridge beams in a few locations, but not all. Similarly, there are tie-beams between a few of the rafters running just underneath the ridge beam, but otherwise the volume of the barn inscribed by the framing is open. The roof framing appears to be in generally good condition, with the exception of the exposed rafter tails, which are in generally fair condition. Greater exposure to the elements has caused the rafter tails to be more weathered than the protected, interior sections of framing, and in several cases the wood is splitting and beginning to check, however no significant deterioration or loss of profile was observed. The side closest to the corrugated metal displays some weather originated discoloring due to the heat originated by the metal and from humidity and rot possibly from filtering water or from condensation effects in the cooler hours of the day.

Post and Beam Framing

The main supporting structure is made of hand-hewn single pieces of redwood. Joints between the main framing elements are formed by the mortise-and-tenon system, not requiring nails or other auxiliary elements to secure the joints. All the main frame elements are in good conditions, showing only minor signs of decoloring and humidity near the base of the posts, where they are in direct contact with the foundations. These signs also show on beams in the locations next to the façade cladding where either or both boards and battens are missing.

Figure 1

East façade has symmetric doors and windows. Traces of whitewash at the top part of the cladding. Skip sheathing boards covered by another that follows the roof line of the gale end. Roof at 45 degree angle

Figure 2

Foundation beam. Deterioration along lower section of boards conforming all façades. Heavy use and weathering deterioration of floor boards.

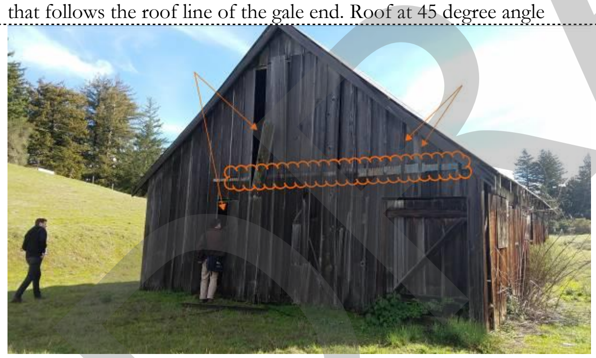


Figure 3

West façade, some boards have collapsed or are missing parts. Metal sheet addition to tie the boards to the beam on the other side

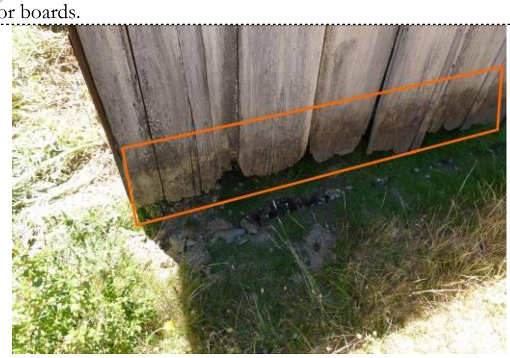


Figure 4

Heavy weathering and deterioration of the cladding in lower section of all façades

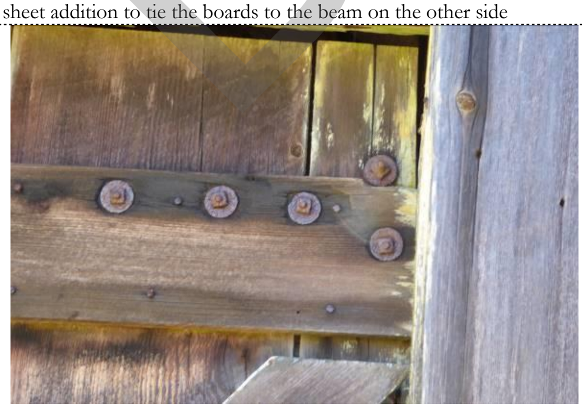


Figure 5

Square nuts and bolts holding hinges of doors

Figure 6

Sliding window at the south façade.

Figure 7

Main structure elements are hand-hewn while exterior cladding is machine sawn. Open separation between cladding boards corresponds to missing battens. Some boards are missing or have collapsed

Figure 8

Mortice and tenon joints between main structure elements. Hinges for doors are attached using square headed nuts and bolts. Some boards from the cladding are missing. Display of humidity and moss growth

Figure 9

Main structure elements are hand-hewn while exterior cladding is machine sawn. Open separation between cladding boards corresponds to missing battens. Some boards are missing or have collapsed

Figure 10

Image 35: Floor boards heavily weathered. Cladding boards missing or collapsed with openings due to missing battens. Evident signs of humidity and deterioration of floors and cladding

Figure 11

Boarded window of the east façade. Interior partitions added and modified as required by use needs

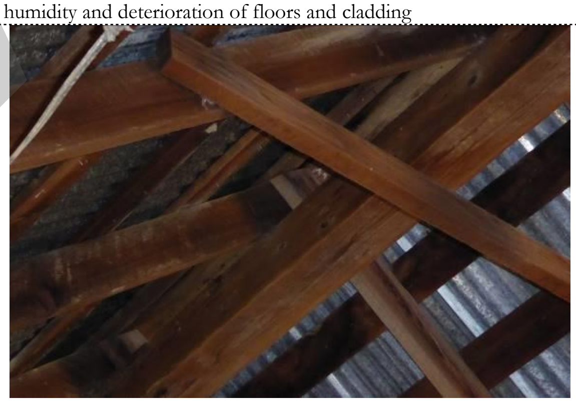


Figure 12

Rafters joints to the main structure beam by mortice and tenon or similar system, without use of metal elements. Corrugated metal roof

PROPOSED PROJECT ALTERNATIVES EVALUATION

The following evaluation concerns the work required to address architectural deterioration and deficiencies, and plan for the necessary building maintenance associated with the proposed project alternatives. For recommended structural stabilization and rehabilitation work, please see the report produced by ZFA.

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

This option proposes to install a fence around the perimeter of the property to restrict access to the home in order to mitigate potential public safety concerns associated with unauthorized access to the building. No distinct hazards were observed at the exterior of the building at the time of survey in July, 2019. Since this option does not seek to stabilize the resource for any future use or prevent further deterioration, it would not be consistent with the Secretary of the Interior's Standards.

The absence of paint on the exterior of the building exposes the historic wood materials to further deterioration from weather and ultraviolet radiation. While it is difficult to estimate how long it would be before the building materials have deteriorated beyond repair, the cost of repair and rehabilitation will continue to increase with time as the deterioration progresses. Since the vernacular use of redwood framing and cladding is an important character-defining feature, maintenance and retention of those materials is important to the integrity of the resource and its eligibility for the National Register of Historic Places and the California Register of Historical Resources. Significant loss of material integrity could jeopardize the eligibility of the resource.

2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

Of the treatments defined by the *Secretary of the Interior's Standards* (Standards), the standards for Preservation are the most appropriate to this proposed project alternative. To mitigate potential falling hazards, the security of exterior features such as shutters, board-and-batten siding, and roofing should be inspected and re-secured as required. Fenestration that is currently boarded-up should be inspected semi-annually and plywood protection should be re-secured as required. The Barn foundation should be stabilized and repaired as described in the Structural recommendations. Once necessary repairs and selective replacement work have been completed, the Barn should be repainted to protect the historic redwood cladding from the elements. Due to the depth of the UV damage in some areas, the preparation of the substrate for painting should be as gentle as possible to achieve a sound coating, and it is not recommended that the existing texture of the wood be significantly altered. The condition of the coating should be inspected annually, and the building will likely require repainting every 7-10 years to maintain a sound coating on the wood.

All doors and windows should be secured against unauthorized entry. Additional security measures to guard against unauthorized access should be installed at potential points of access in order to protect the building and the public. The building interior should be inspected at least semi-annually for signs of human, wildlife, or water intrusion into the building, and any observed intrusion should be addressed as soon as possible.

3. **Repair and rehabilitate the structure for reuse** as a storage facility for District Use

Of the treatments defined by the *Secretary of the Interior's Standards* (Standards), the standard for Rehabilitation would be the most appropriate to this proposed project alternative. In addition to the envelope repair described in proposed project alternative #2 for the Barn, rehabilitating the building for a storage use should include the following:

- Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements.
- The floor in the building should be rehabilitated
- Interior lighting should be installed to meet code required minimums for safety.

Given the wooden construction of the building, it would be inadvisable to store any flammable materials within the barn, or any items that would increase the risk of fire or damage to the historic resource. Care should be taken when moving items in and out of the building to protect the door framing from impact damage; install temporary protection if necessary in a manner that does not attach directly to or otherwise damage the historic fabric of the barn.

4. **Remove the structure** and restore the underlying natural resource values.
Demolishing the White (Dyer) Barn, which has been determined to be an historic resource, may require additional processes to obtain demolition permits. Debris from the demolished building, including all hazardous materials, would need to be disposed of in accordance with Local, State, and Federal Regulations, and the site would need to be cleaned up and remediated to allow for public access.

EXHIBIT B

Structural Condition Assessment and Basis of Design

by ZFA Structural Engineers

Attachment 2

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

WHITE (DYER) BARN
STRUCTURAL CONDITION ASSESSMENT REPORT AND BASIS OF DESIGN (BOD)

Midpeninsula Regional Open Space District

La Honda Creek Open Space Preserve, San Mateo County, California

District Project Number: MAA05-008

March 13, 2020

Prepared For

Midpeninsula Regional Open Space District

330 Distel Circle

Los Altos, CA 94022

Prepared By

Steven Patton, SE, Senior Associate

Mark Moore, SE, Principal-in-Charge

San Carlos, California

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

The following structural Basis of Design report provides an evaluation of the condition and anticipated performance of the existing White Barn structure to support seismic and gravity loading as well as a conceptual design of the structural scope required to achieve four proposed project alternatives. The findings and recommendations contained herein, in conjunction with those from the other team members, are intended to assist the District with cost evaluations and decision-making. The four alternatives being considered are:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a storage facility for District use.
4. **Remove the structure** and restore the underlying natural resource values

Structural Condition Assessment

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. The structure above grade appears to be in generally fair to good structural condition for the era of construction. The base of the structure in contact with soil appears to be in poor condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review. As-built drawings contained herein were created by ZFA based on visual observations and measurements made during site visits.

The following major structural deficiencies were also observed in the existing building; all photos referenced can be found in the *Structural Systems and Condition Assessment* section.

- The structure is founded on wood timber beams that are sit directly on the soil and have significantly deteriorated over time (see Photo 3 and Photo 4). No foundation is present.
- Settlement was observed likely due to the deteriorating base of the structure. The structure is generally tilting in the downhill direction of the slope.
- The structure supporting gravity loads is comprised of wood timber, which are connected with mortise and tenons. This connection is not acceptable by current building code standards.
- Deterioration was observed at framing and exterior siding locations that have been exposed to weather and moisture (see Photo 5).

Seismic Assessment

The White Barn has been reviewed for the Collapse Prevention performance level using the Tier 1 evaluation of the ASCE 41-17 standard *Seismic Evaluation and Retrofit of Existing Buildings*. The building was reviewed based on the visual assessments performed by ZFA staff, geotechnical investigation performed by Romig Engineers and ASCE 41-17 structural Tier 1 checklists. Nonstructural elements were not included in the scope of the Tier 1 analysis.

The building is constructed of roughhewn timber framing connected with mortise and tenon joints. The exterior walls are comprised of vertical board and batten siding. The structure lacks a conventional seismic force-resisting system, and is expected to perform poorly during a significant earthquake. Six (6) Tier 1 deficiencies were identified as noncompliant. See the Findings and Recommendations section of this report for additional information on the items noted below.

- LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
    - There is no defined lateral force-resisting system present in the existing structure. The timber frames and exterior siding are not adequate to transfer seismic forces to the foundation. The corrugated steel roof is not adequate to act as a roof diaphragm.
    - The structure is supported directly on the soil with no foundation.
- REDUNDANCY: Shear walls are not present and therefore there is no redundancy in the lateral force-resisting system.
- WOOD POSTS: There are no foundations, and therefore no positive connections between wood posts and the foundation.
- GIRDER/COLUMN CONNECTION: Columns and girders are connected by mortise and tenon; no plates or connection hardware are present.
- ROOF CHORD CONTINUITY: Continuous roof diaphragm chords are not present around the perimeter of the roof.
- OTHER DIAPHRAGMS: The de-facto roof diaphragm is corrugated steel which is not adequate to resist seismic forces.

Geotechnical Investigation

A geotechnical investigation report has been prepared by Romig Engineers (Appendix C). Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- Varying depth to competent bearing material up to 6 feet is anticipated across the structure (page 7).
- The site is noted to be in an area that is potentially susceptible to earthquake-induced landslides, but due to the moderate slopes in the immediate vicinity of the barn, this is not likely to be of concern for this structure (page 4).
- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 7).

The following evaluation report details our structural findings and recommendations.

INTRODUCTION

The purpose of this evaluation is to review and evaluate the structure of the subject building using visual observations, engineering judgment and criteria provided by ASCE 41-17. The evaluation is focused on identifying deficiencies that are present in the structural system that may affect the performance of the building under gravity or seismic loads to identify structural scope that is required to stabilize the building for mothballing or rehabilitate it as an occupied structure.

The seismic evaluation is based on criteria that has been tailored for specific building types and desired levels of building performance based on observation of structural and nonstructural damage occurring in previous earthquakes and provides a means to identify general deficiencies based on anticipated behavior of specific building types. The Tier 1 evaluation procedure of ASCE 41-17 was used to assess primary components and connections in the seismic force-resisting system using standard checklists and simplified structural calculations. Checklist items are general in nature and are intended to highlight building components that do not exceed conservative construction guidelines. If the element is compliant, it is anticipated to perform adequately under seismic loading without additional review or strengthening. Items indicated as non-compliant in a Tier 1 checklist are considered potential deficiencies that require further analysis. The results of the Tier 1 evaluation provide a general understanding of the anticipated performance of the structure in its current state and inform the structural scope required to provide overall stability if the building is to be mothballed with no public access to the interior. If the building is to be rehabilitated for an occupied use, the Tier 1 results indicate that retrofit of the structure is required. The retrofit is designed to the governing building code, which is the 2016 or 2019 California Historical Building Code. The structural scope for these alternatives, as well as restricted access and demolition options, are summarized in this report.

EVALUATION OVERVIEW

This structural evaluation report for the existing White Barn is based on the following:

- The American Society of Civil Engineers/ Structural Engineering Institute (ASCE/SEI 41-17) Standard *Seismic Evaluation and Retrofit of Existing Buildings* using Tier 1, Collapse Prevention structural evaluation criteria.
- Multiple site visits for general review of the structure were performed by Steven Patton of ZFA. No destructive testing or removal of finishes was performed or included in the scope.
- Existing material properties as indicated in Appendix C.
- Review of the following geotechnical report and hazard maps:
    - Geotechnical Report prepared by Romig Engineers dated October 2019

STRUCTURE OVERVIEW

<u>General Site Description</u>

The building is located on a moderately sloping site located in the Midpeninsula Regional Open Space District (District) La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The building site is in a remote area south of Skyline Boulevard on Kebet Ridge/Allen Road. The building is currently unoccupied.

<u>Structural Performance Objective</u>

In accordance with ASCE 41-17, a structural performance objective consists of a target performance level for structural elements in combination with a specific seismic hazard level. For the seismic assessment of the subject building, the Basic Performance Objective for Existing Buildings (BPOE) was selected. While the BPOE seeks safety for occupants with reasonable confidence, it allows existing structures to be assessed for seismic forces that are less than those required for the design of new structures under the current building code (2016 or 2019 California Building Code). Buildings meeting the BPOE are expected to experience nominal damage from relatively frequent, moderate earthquakes, but have the potential for significant damage and economic loss from the most severe, though less frequent, seismic events. It should be noted that the cost savings from not retrofitting the subject building up to current code standards may result in greater repair costs in the event of an earthquake.

For the purposes of this Tier 1 review to the BPOE, the specified level of performance is **Collapse Prevention (S-5)** for this former agriculture building (assumed to be Risk Category II as defined by ASCE 7). The Collapse Prevention Structural Performance Level as described by ASCE/SEI 41-17 is defined as: "…the post-earthquake damage state in which a structure has damaged components and continues to support gravity loads but retains no margin against collapse. A structure in compliance with the acceptance criteria specified in this standard for this Structural Performance Level is expected to achieve this state." Retrofit of the building to satisfy this performance objective would only be mandatory for Alternative *3* which would allow for re-occupancy of the unpermitted building.

The S-5 Structural Performance Level can be defined as less than the Life Safety (S-3) performance level. For further context, the Life Safety Structural Performance Level (S-3), is described as: *'… the post-earthquake damage state in which significant damage to the structure has occurred but some margin against either partial or total structural collapse remains.'*

A Tier 1 evaluation of nonstructural elements was not included within the scope of this review.

<u>Site Seismicity (Earthquake Activity)</u>

In accordance with ASCE 41-17, 'seismicity', or the potential for ground motion, is classified into regions defined as Low, Moderate, or High. These regions are based on mapped site accelerations S_s and S_1, which are then modified by site coefficients F_a and F_v to produce the Design Spectral Accelerations, S_{DS} (short period) and S_{D1} (1-second period). The successful performance of buildings in areas of high seismicity depends on a combination of strength, ductility of structural components, and the presence of a fully interconnected, balanced, and complete seismic force-resisting system. Where buildings occur in lower levels of seismicity, the strength and ductility required for better performance is significantly reduced and building components or connections with additional strength capacity can in some cases be adequate despite lacking ductility.

Based on the geotechnical investigation and report prepared for the subject site, the soil profile of this building has been determined by the geotechnical engineer to be classified as **Site Class C** as defined by ASCE 41-17 and is used in determination of site coefficients F_a and F_v.

According to the site values indicated by the geotechnical report, USGS data and evaluated using seismic acceleration equations and tables of ASCE 41-17, the site is located in a region of **High Seismicity** with a design short-period spectral response acceleration parameter (S_{DS}) of 1.556g and a design spectral response acceleration parameter at a one second period (S_{D1}) of 0.97g. Per the table shown below, both of these parameters exceed the lower boundaries for high seismicity classification, 0.5g for S_{DS} and 0.2g for S_{D1}.

*Level of Seismicity**	S_{DS}	S_{D1}
Low	< 0.167g	< 0.067g
Moderate	≥ 0.167g < 0.500g	≥ 0.067g < 0.200g
High	≥ 0.500g	≥ 0.200g

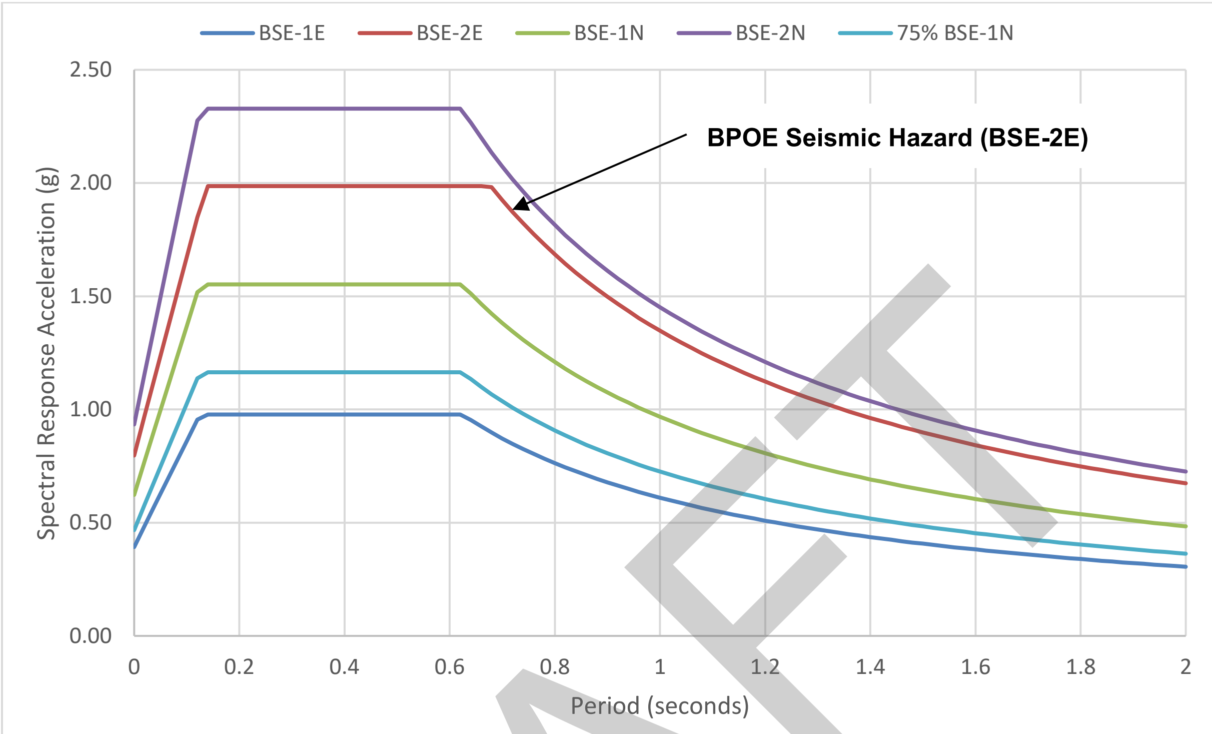
*Where S_{XS} and S_{X1} values fall in different levels of seismicity, the higher level shall be used.

The spectral response parameters S_S and S_1 were obtained for the BSE-2E seismic hazard level for existing structures (BPOE). The acceleration values were adjusted for the maximum direction and site class in accordance with ASCE 41-17 Section 2.4.1, and compared to BSE-2N (defined by current building code as the maximum considered earthquake for design of new buildings) to determine the design values for the Tier 1 analysis, since values obtained for the BSE-1E hazard level need not exceed the hazard levels for new construction.

The following charts depict the response spectra for the multiple seismic hazard levels defined by ASCE 41-17: two existing hazard levels and two hazard levels corresponding to code design of new structures (ASCE 7). Note that the seismic hazard level for design of existing structures is lower than that for new construction for this structure (period <1.0).

Seismic Hazard Level*	**Building Code Reference**	**Design Spectral Acceleration $S_{a(XS)}$(T)**
BSE-1E	ASCE 41-17 (20%/50yr)	0.98g
BSE-1N	ASCE 7-10 Design Basis Earthquake (DBE)	1.556g
BSE-2E	ASCE 41-17 (5%/50yr)	1.991g
BSE-2N	ASCE 7-10 Maximum Considered Earthquake (MCE)	2.334g

* Seismic hazard levels denoted with 'E' for existing buildings or 'N' for new building equivalency.



Structural Systems and Condition Assessment

General

The one-story, wood-framed barn structure was constructed around 1860. The building footprint is approximately 25 feet by 40 feet, with a floor area of approximately 960 square feet. Plans, sections and elevations are shown for reference in Figures 1 through 4. Refer to Appendix B for a complete set of annotated structural drawings. The building is rectangular in plan, with the long direction oriented in the East-West direction. Modifications to the existing structure, including the installation of some newer framing, appears to have occurred since the original construction. This is evident by the presence of machine-milled framing in some locations, which contrasts with the roughhewn original timber framing.

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. The structure above grade appears to be in generally fair to good structural condition for the era of construction. The base of the structure in contact with soil appears to be in poor condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review.

Roof Framing

The roof is composed of corrugated metal sheathing that is supported by 1x6 skip sheathing at 16” on center. The corrugated metal roofing was added subsequent to the original construction. The 1x sheathing is supported by 2x6 rafters spaced at 3 feet on center. The rafters are supported by a ridge beam at the peak of the gable roof and an 8x8 beam at the exterior walls. There is an approximately 10” overhang at the ends of the gable roof. The roof framing, viewed from the ground, appeared to be generally in good condition. Some localized deterioration due to weather ingress is assumed because of gaps observed in the corrugated metal roofing.

Post and Beam Framing

The primary structure is comprised of a timber post and beam system with 8x8 posts at 8 feet on center along the north and south ends of the building, as well as along the center of the building below the ridge. These posts support 8x8 beams, which in turn support the roof rafters. Posts and beams are typically connected with mortice and tenon joints. 4x4 knee braces are located along each column line, which were originally intended to provide lateral stability for wind loading. The roof framing plan is shown in Figure 2 and a section through the building is shown in Figure 3. An elevation of the south side of the building is shown in Figure 4. The timber framing was observed to be in generally good condition.

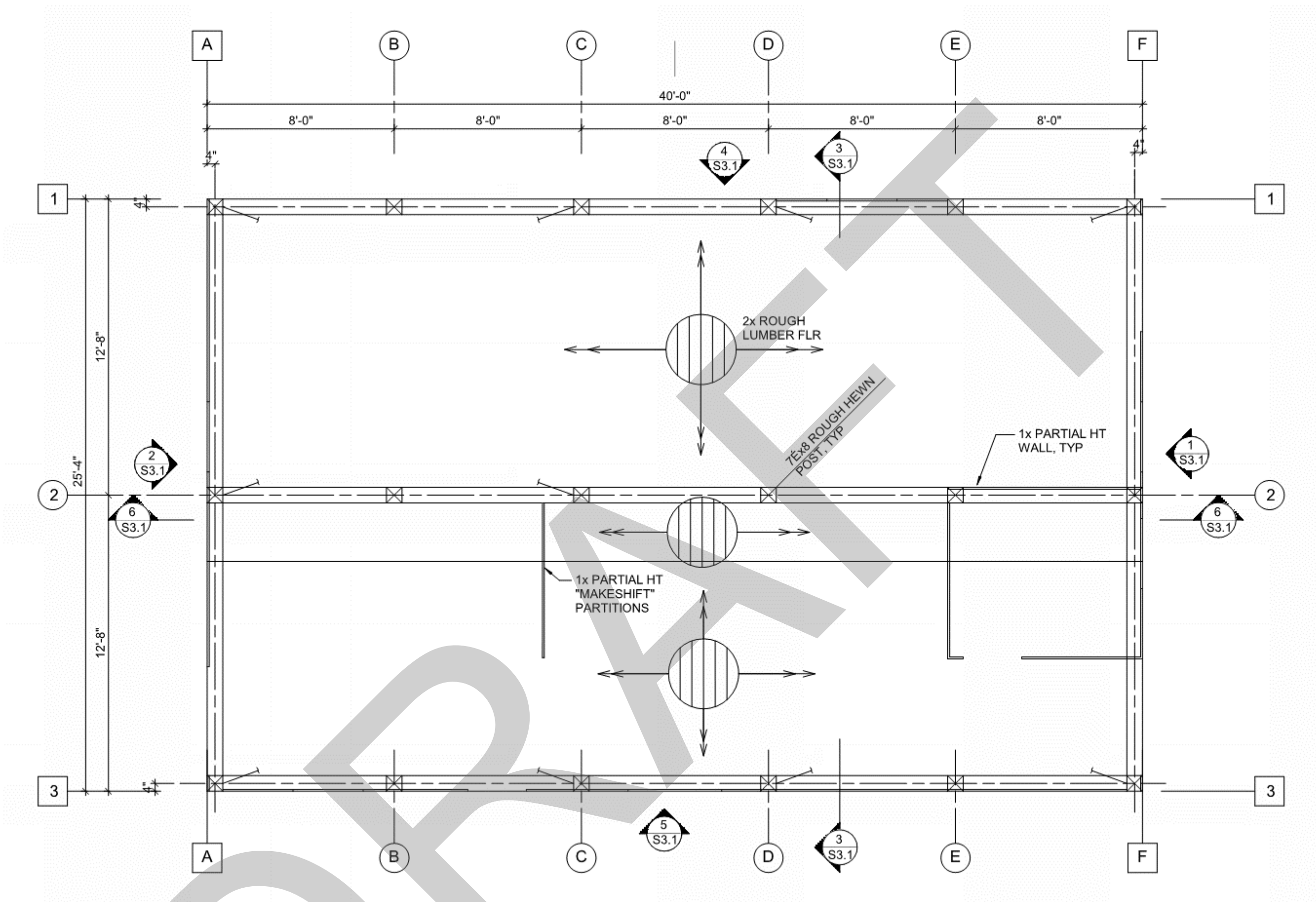


Figure 1: Existing Ground Floor Framing Plan developed by ZFA

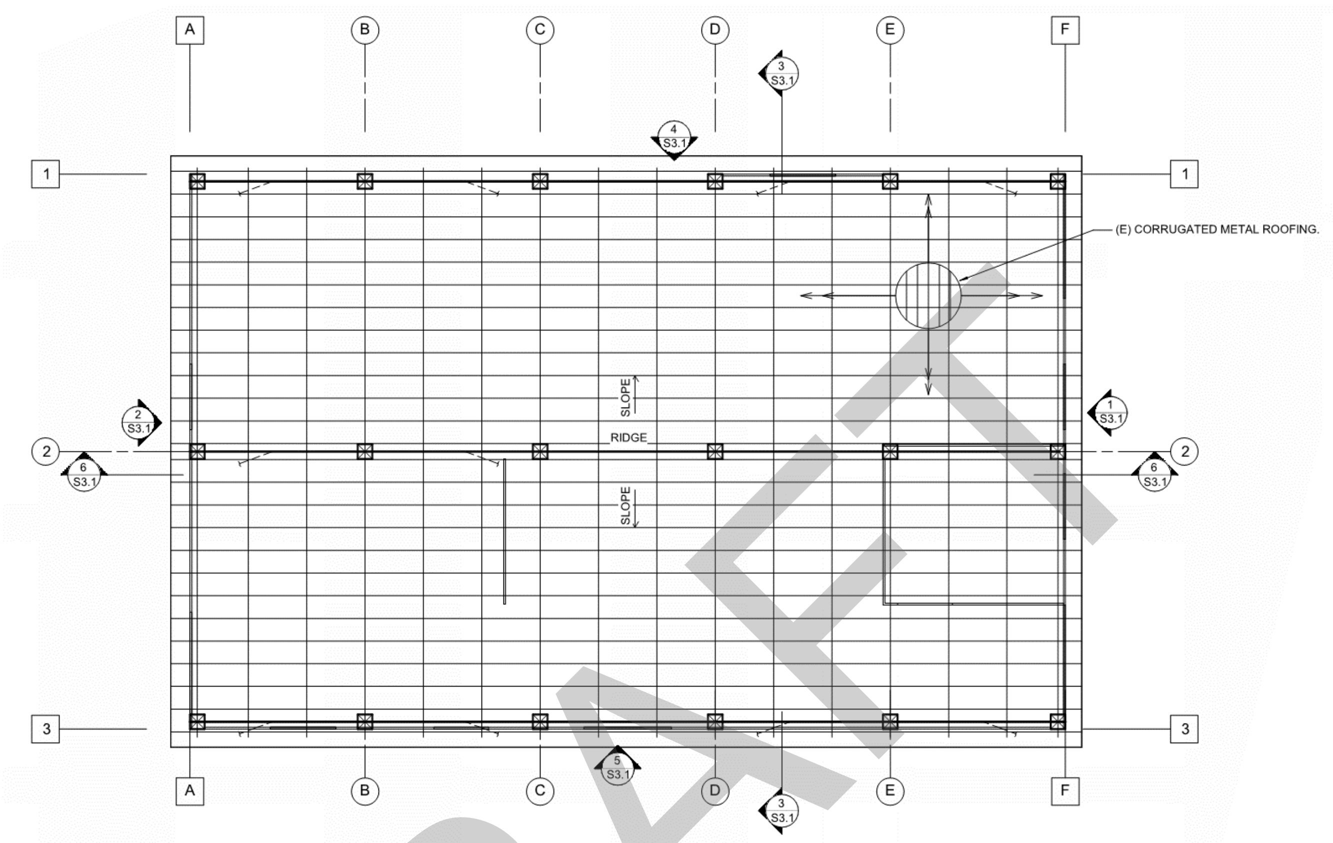


Figure 2. Existing Roof Framing Plan developed by ZFA

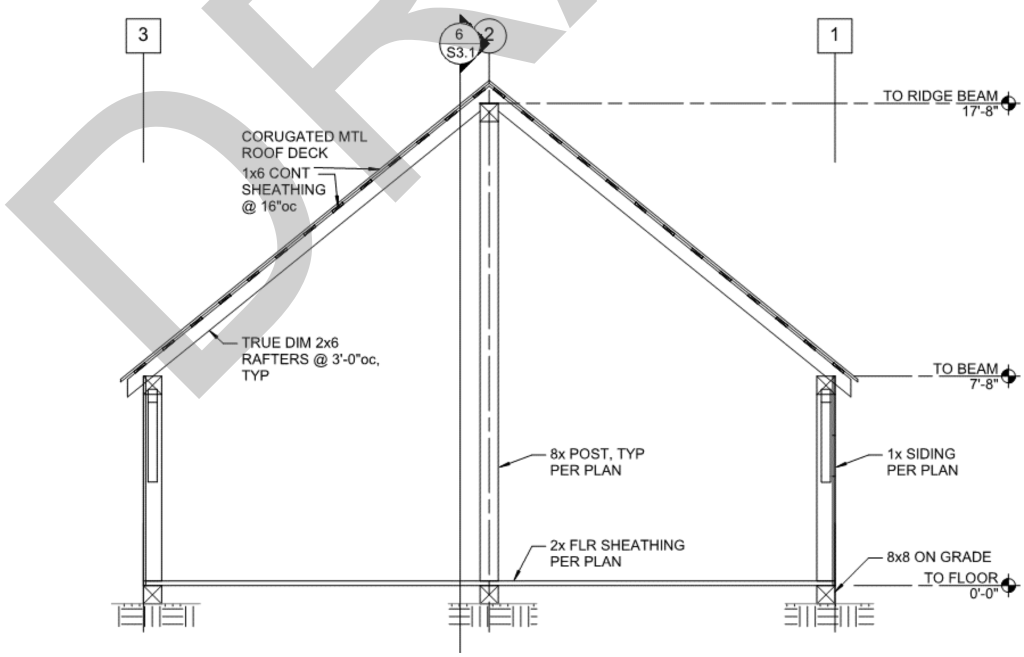


Figure 3. Transverse Section Through Building developed by ZFA

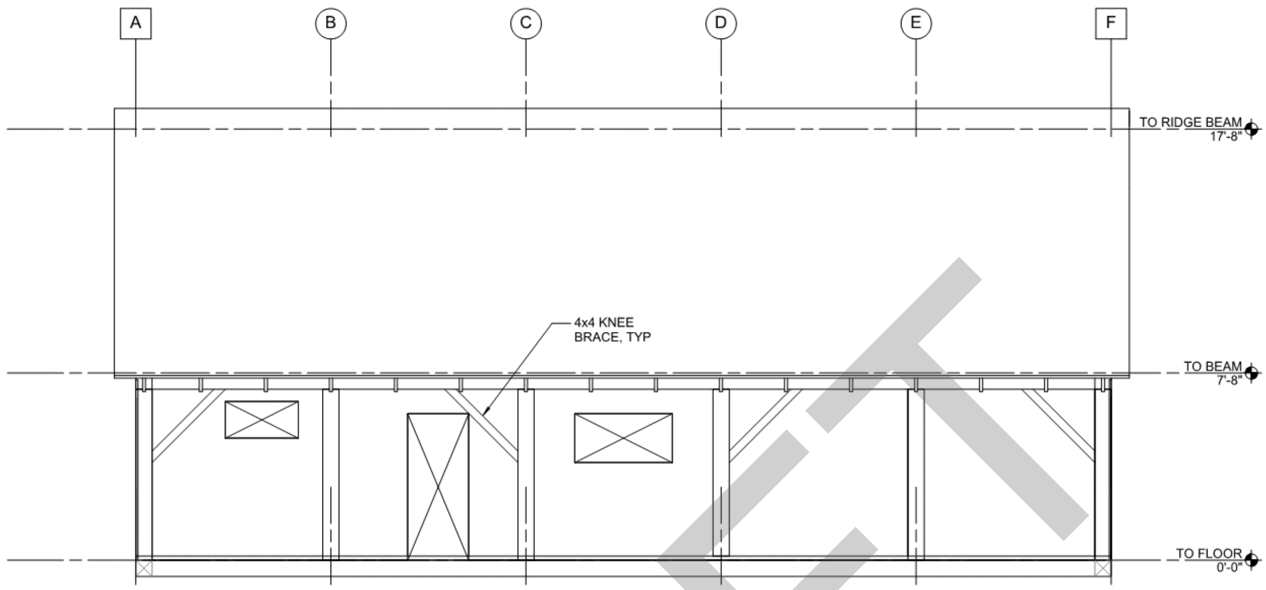


Figure 4. South Elevation developed by ZFA

Walls

Walls are comprised of 1x vertical board and batten siding that spans between the wood grade beam and roof beam along the shorter sides of the building. At the gable ends of the building, a wind girt is located at the lower roof level and provides an intermediate support for 1x siding between the wood grade beam and perimeter roof rafters. The wall siding was generally in fair to poor condition with obvious signs of deterioration due to weather exposure particularly at the bottom of the walls adjacent to soil (see Photo 5). Battens are also missing in many locations and the walls do not provide a waterproof or pest resistant façade for the interior of the structure. Miscellaneous interior partial height walls are present in some locations and do not contribute to the structural integrity of the building.

Floor Framing

At the ground floor level, the flooring is composed of 2x straight sheathing that is assumed to be supported by wood floor framing. The floor sheathing is in fair to poor condition with deterioration observed at some locations, particularly at the perimeter of the building (see Photo 6). The floor framing sits just above or directly on the soil, so there is no access to observe the condition or type of framing. Deterioration due to soil contact is assumed in the floor framing throughout.

Seismic Force-Resisting System

The building generally lacks a seismic force-resisting system. De-facto lateral resistance is provided by the knee braces in the post and beam system, although this provides limited strength and ductility and is inadequate to resist the significant seismic forces that may occur at this site. The corrugated metal roofing serves as the de-facto roof diaphragm.

Foundations

The foundations for this structure are limited to wood grade beams placed directly on the soil. This wood has significantly deteriorated and contributed to settlement of the structure over time.

Material Properties

Basic properties for existing structural materials found on existing building documentation or in accordance with ASCE 41 code prescribed minimum structural values utilized in the analysis calculations can be found in Appendix C.

Photo 1. Front elevation

Photo 2. Side elevation

Photo 3. Existing condition at foundation

Photo 4. Existing condition at foundation

Photo 5. Deterioration of exterior siding

Photo 6. Deterioration at floor sheathing

Photo 7. Deterioration at base of exterior wall

Building Type

This structure type is not defined specifically in ASCE 41-17. The closest type of structure this building can be classified as is **Building Type W1: Wood-Light Frames**, which was used for this evaluation. As described by ASCE/SEI 41-17: *'These buildings are single- or multiple-family dwellings one or more stories high with plan areas less than or equal to 3,000 ft^2. Building loads are light, and the framing spans are short. Floor and roof framing consist of wood joists or rafters on wood studs spaced no more than 24in. apart. The first floor framing is supported directly on the foundation system or is raised up on cripple studs and post-and-beam supports. The foundation is permitted to consist of a variety of elements. Chimneys, where present, consist of solid brick masonry, masonry veneer, or wood frame with internal metal flues. Seismic forces are resisted by wood frame diaphragms and shear-walls. Floor and roof diaphragms consist of straight or diagonal lumber sheathing, tongue-and-groove planks, oriented strand board, plywood, or other materials. Shear walls are permitted to consist of straight or lumber sheathing, plank siding, oriented strand board, plywood, stucco, gypsum board, particleboard, fiberboard, or similarly performing materials. Interior partitions are sheathed from floor to floor with plaster or gypsum board. Older construction often has open-front garages at the lowest story and is permitted to be split-level.'*

Historical Performance

Smaller wood-framed structures, particularly those with wood shear walls, have typically performed relatively well in earthquake events provided adequate shear wall length is maintained without localized stresses in short wall piers and there are no significant plan or vertical discontinuities such as a difference in stiffness between floors in a multi-storied structure. This structure is significantly different than these typical structures, entirely lacking any shear walls, and is expected to perform poorly during a significant earthquake.

Benchmark Buildings

In addition to classifying buildings by type of construction, ASCE 41 identifies 'Benchmark Buildings' for each type. The detailing of seismic force-resisting systems in Benchmark Buildings is generally considered to meet the performance requirements of ASCE 41. When a building is determined to meet Benchmark Building requirements through field verification of construction compliant with benchmark code requirements, only review of foundation and non-structural elements is required. The subject building was constructed in the 1860's, well before the benchmark date for this type of construction. Since it does not meet the criteria of a Benchmark Building, a complete Tier 1 analysis is performed.

FINDINGS AND RECOMMENDATIONS

Structural Seismic Deficiencies

The ASCE 41-17 Tier 1 Collapse Prevention and Building Type Specific Checklists indicate the primary building structure as non-compliant in six (6) areas. These items would all need to be addressed prior to re-occupancy of the building (Alternative 3). General recommendations to address the deficiencies are summarized below; more specific structural scope items are provided in Alternative 3 of the *BOD Alternatives and Recommended Repair Narrative* section and Appendix B.

a) LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
    i) Recommendation: In order to provide a complete seismic force-resisting system, provide the following:
        i. New vertical lateral system such as wood shear walls or tension braced frames.
        ii. New plywood sheathing on existing roof framing.
        iii. New foundations beneath the new lateral system.
b) REDUNDANCY: Shear walls are not present and therefore there is no redundancy in the lateral force-resisting system.
    i) Recommendation: The recommendations for item (a) will address this deficiency.
c) WOOD POSTS: There are no foundations, and therefore no positive connections between wood posts and the foundation.
    i) Recommendation: Provide new concrete spread footings with steel hardware connections to existing posts.
d) GIRDER/COLUMN CONNECTION: Columns and girders are connected by mortise and tenon; no plates or connection hardware are present.
    i) Recommendation: Provide steel hardware at connection. Connection reinforcing may be designed to be hidden and not obscure the historical connections.
e) ROOF CHORD CONTINUITY: Continuous roof diaphragm chords are not present around the perimeter of the roof.
    i) Recommendation: The recommendations for item (a) will address this deficiency.
f) OTHER DIAPHRAGMS: The de-facto roof diaphragm is corrugated steel which is not adequate to resist seismic forces.
    i) Recommendation: The recommendations for item (a) will address this deficiency.

Structural Gravity Deficiencies

a) The structure is founded on wood timber beams that are sit directly on the soil and have significantly deteriorated over time (see Photo 3 and Photo 4). No foundation is present.
    i) Recommendation: Provide new concrete strip footing around perimeter of structure and concrete spread footings under interior posts. Repair deteriorated framing.
b) Settlement was observed likely due to the deteriorating base of the structure. The structure is generally tilting in the downhill direction of the slope.
    i) Recommendation: The recommendations for item (a) will address this deficiency.

c) The structure supporting gravity loads is comprised of wood timber, which are connected with mortise and tenons. While these connections have historically performed adequately, this connection is not commonly acceptable by current standards.
   i) Recommendation: The recommendations for item (a) of seismic deficiencies will address this deficiency.
d) Deterioration was observed at some framing locations that have been exposed to weather and moisture (see Photo 5).
   i) Recommendation: Replace deteriorated framing in kind. Repair exterior of structure to mitigate future exposure to weather.

<u>BOD Alternatives and Recommended Repair Narrative</u>

Recommendations for the following alternatives are also shown in the conceptual structural drawings in Appendix A of this report.

BASIS OF DESIGN ALTERNATIVE #1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance. (See drawing 1-S2.1)

1) Install a secure fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 300 lineal feet and is recommended to be at least 20 feet from the perimeter of the building to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.

BASIS OF DESIGN ALTERNATIVE #2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure. (See drawings 2-S2.1 & 2-S3.1)

The recommended stabilization methods specifically target only the gravity related structural deficiencies and would not allow for re-occupancy of the building. The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.

1) Install pressure treated blocking/shims at locations of deteriorated wood grade beams to prevent further settlement of the superstructure.
2) Provide 2x10 cross bracing at the interior of exterior walls. Assume two bays of cross bracing along each perimeter wall in longitudinal direction and one or two bays of bracing along each perimeter wall in the transverse direction (assume 7 bays total) to allow for access through at least one door opening.
3) Follow the *Mothballing Guidelines* including:
   a. Secure the building and its component features to reduce vandalism or break-ins.
   b. Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
   c. Provide adequate ventilation to the interior.
   d. Develop and implement a maintenance and monitoring plan for protection.
4) Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements. Fenestration that is currently boarded-up from the exterior should be repaired, and the non-historic plywood should be removed.

BASIS OF DESIGN ALTERNATIVE #3: **Repair and rehabilitate the structure for reuse** as a storage facility for District use. (See drawing 3-S2.1 & 3-S3.1)

The stabilization methods proposed for this alternative target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code (2016 or 2019 California Historical Building Code) to allow for re-occupancy of the existing building.

1) New concrete foundation:
    a. Install new 18-inch wide by 30-inch deep shallow strip footing around the perimeter of the building that extends a minimum of 6" above grade. See geotechnical report for requirements. Assume 130 linear feet of continuous footing.
    b. Install new 24-inch square by 30-inch deep spread footings under existing posts. See geotechnical report for requirements. Spread footings to extend a minimum of 6" above grade. Assume 4 spread footings.
    c. The foundation can be installed in sections in a "hit and miss" sequence to avoid the need to shore the entire structure simultaneously.
    d. Provide new anchors and hardware for connection of existing structure to new foundation.
    e. Assume existing floor sheathing and framing will be removed and replaced after foundation installation.
2) New vertical seismic force-resisting system:
    a. New wood-framed walls with plywood sheathing may be installed on the interior of the perimeter walls. Shear walls would be anchored to new foundations. Plywood sheathing will be visible on the interior face of the exterior walls and will obstruct the view of the existing, exterior wood siding from the inside of the building.
    b. If sheathing of walls is not desired for historic or aesthetic reasons, provide steel tension rod bracing at each perimeter wall with connections to new foundations and new roof diaphragm. Assume two bays of cross bracing along each perimeter wall in longitudinal direction and one bay of bracing along each perimeter wall in the transverse direction (6 bays total).
3) New roof diaphragm:
    a. Remove existing roofing. Install new plywood on existing skip sheathing over roof rafters (approximately 1,100 square feet). Provide allowance for repair/replacement of 20% of roof framing.
    b. Connect roof diaphragm to new vertical lateral system with wood blocking, steel fasteners and steel connection hardware.
    c. Provide new roofing and underlayment over entire roof. Alternatively, existing corrugated metal roofing could be reused as long as a waterproof substrate is installed beneath.
4) Remove and replace deteriorated siding (assume 40% require repair).
5) New floor system:
    a. New wood-framed floor system (assume 2x10 joists at 16" on center) with minimum 8" clearance above grade to bottom of floor joists, sheathed with new ¾" plywood. Assume 24" of soil over entire floor area will be required to be excavated and removed from site to allow for site preparation in accordance with the geotechnical report and for adequate clearance of the floor framing above grade.

BASIS OF DESIGN ALTERNATIVE #4: Remove the structure and restore the underlying natural resource values.

For cost estimation purposes, the complete demolition of the structure, its foundations and site elements assuming that demolition would likely follow a more typical process for permitting and contracting the demolition work. Assume 60 tons of wood materials would need to be removed from the site. (See drawing 4-S2.1)

- Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.

- The site landscaping would be rehabilitated by planting native grasses and tress to return it as close as possible to its original condition prior to the construction of the building.
- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site should also be considered.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.
- Due to the relatively small size of the structure, the District may consider dismantling and relocating the structure as an alternative to demolition.

RELIABILITY OF SEISMIC EVALUATIONS

In general, structural engineers do not have the ability to predict the exact damage to a building as a result of an earthquake. There will be a wide variation of damage from building to building due to the variations in ground motion and varying types and quality of construction. In addition, engineers cannot predict the exact ground motions of the earthquake that may strike a given building. Design and evaluation of buildings are performed using general guidelines and information from past earthquakes. Engineers and the codes used for design and evaluation have been conservative when attempting to ensure that building design meets minimum standards of Collapse Prevention. This effort is based on science and technology as well as on observations made from actual seismic events. Building design and evaluation codes are constantly evolving to better meet performance targets based on this information. Continued research will improve predictive methods and facilitate performance-based engineering. It has been estimated that, given design ground motions, a small percent of new buildings and a slightly greater percent of retrofit buildings may fail to meet their expected performance.

CLOSING

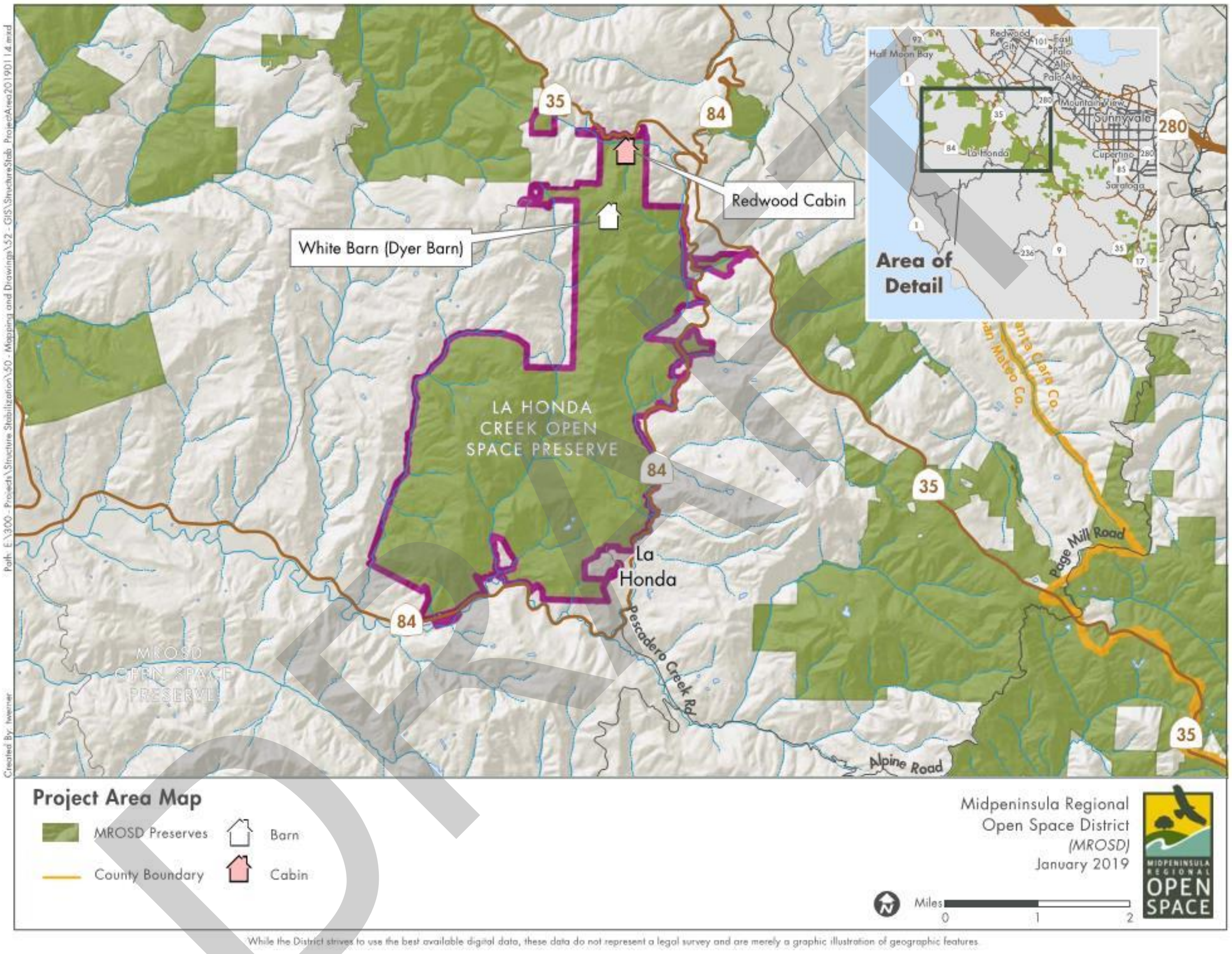
The structural condition assessment, seismic review, analysis and BOD associated with this evaluation were based on the site review of framing and elements of the building which are plainly visible. No attempt was made to uncover hidden conditions or perform any destructive or non-destructive testing. The items discussed in this report are subject to revision should more information become available.

This report is general in nature and does not imply that the recommendations listed above are the only structural requirements that must be made to the existing structure to meet current code criteria.

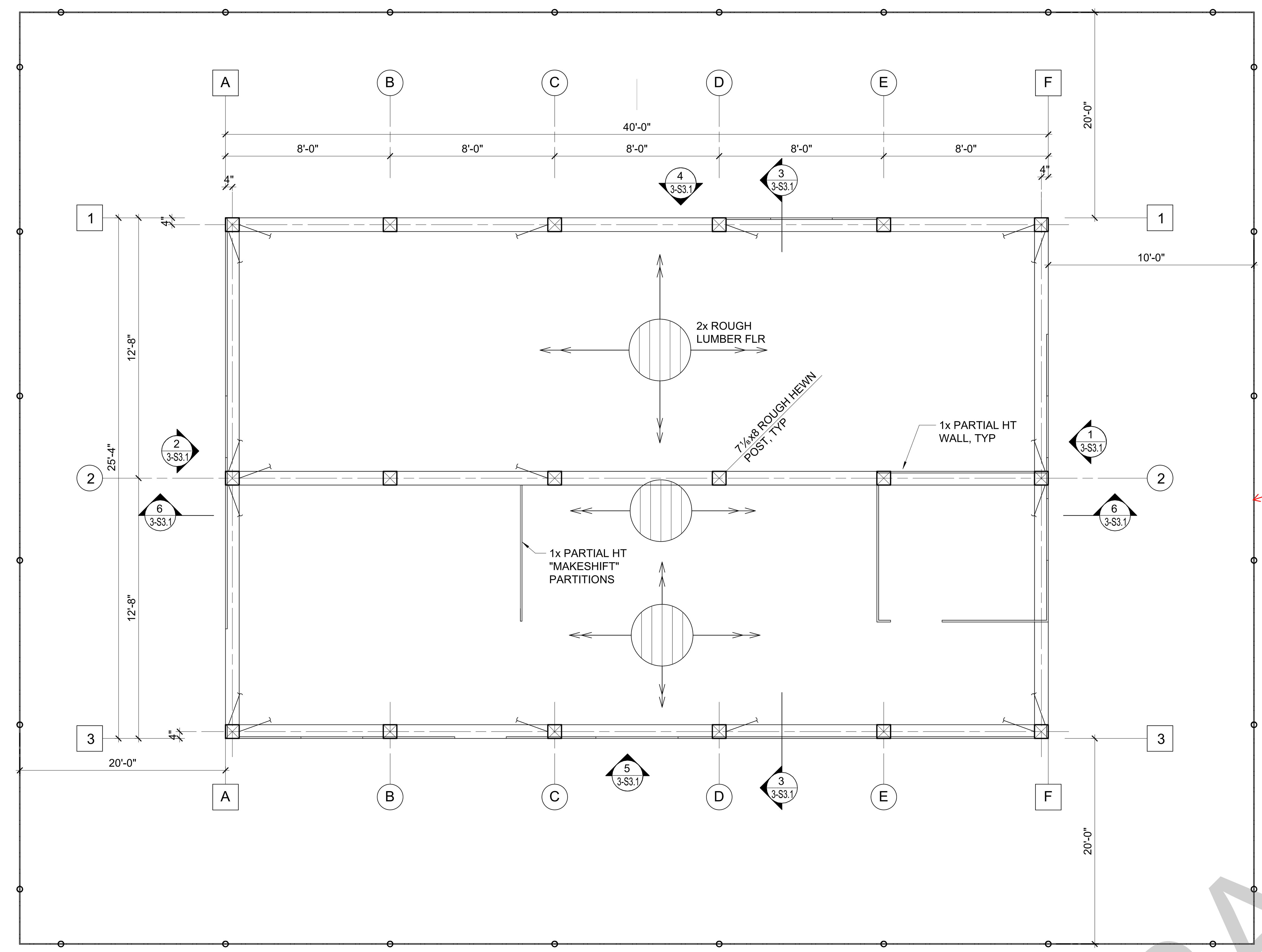
We understand you may have questions regarding this evaluation and are available for comment and explanations. Please call with any questions you may have. Thank you for choosing ZFA Structural Engineers to assist you with this building seismic and structural stabilization review.

Steven Patton, SE	Mark Moore, SE
Senior Associate	Executive Principal

APPENDIX A – SITE MAP


35
84
Redwood Cabin
White Barn (Dyer Barn)
Area of Detail
LA HONDA CREEK OPEN SPACE PRESERVE
84
35
La Honda
84
Pescadero Creek Rd
Page Mill Road
San Mateo Co.
Santa Clara Co.
Alpine Road
35
280
Sunnyvale
Project Area Map
MROSD Preserves
Barn
County Boundary
Cabin
Midpeninsula Regional Open Space District (MROSD)
January 2019
Miles 0 1 2
OPEN SPACE
While the District strives to use the best available digital data, these data do not represent a legal survey and are merely a graphic illustration of geographic features.

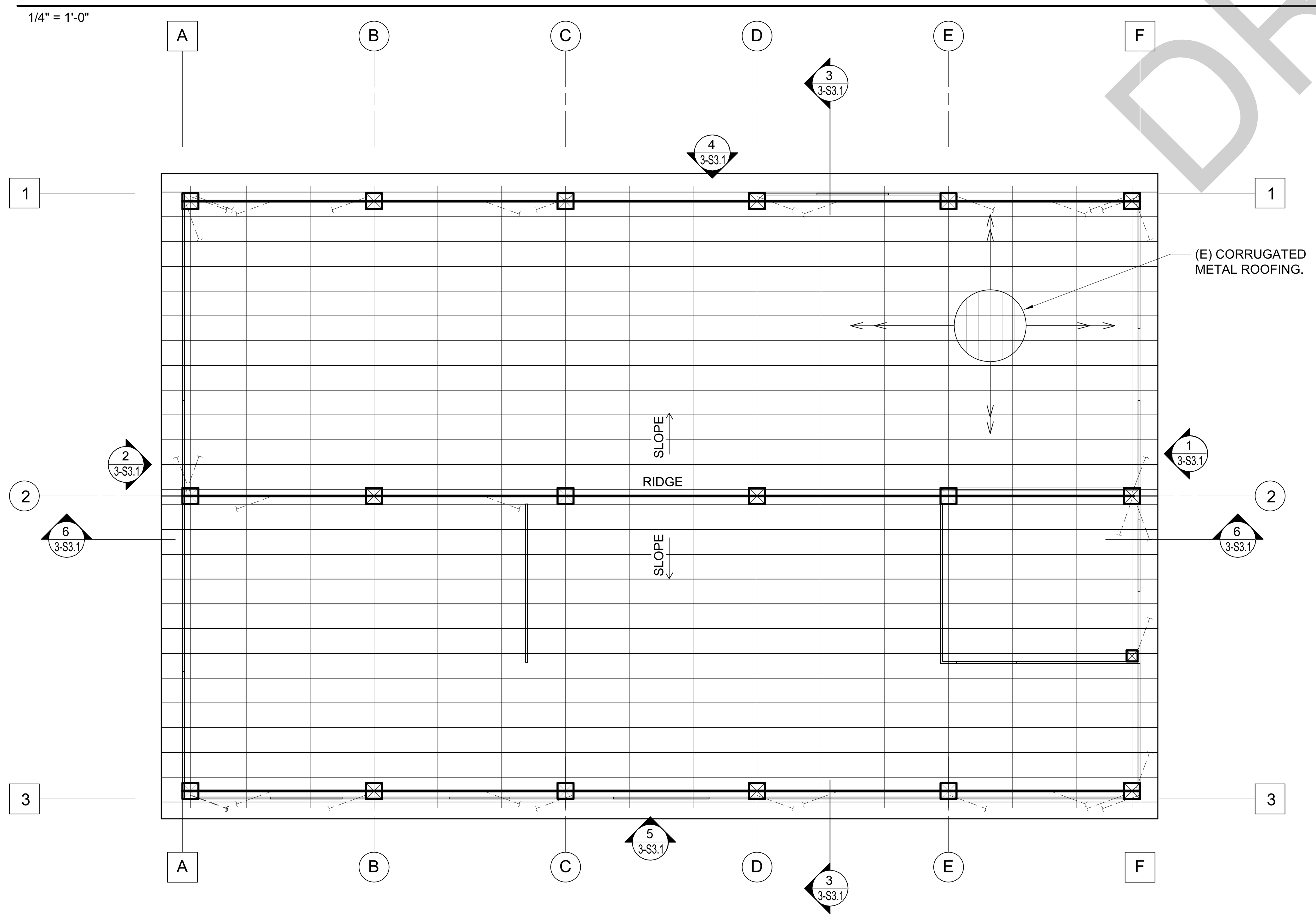
APPENDIX B – STRUCTURAL STABILIZATION BASIS OF DESIGN ALTERNATIVES



NORTH

FLOOR PLAN BOD OPTION 1

1/4" = 1'-0"

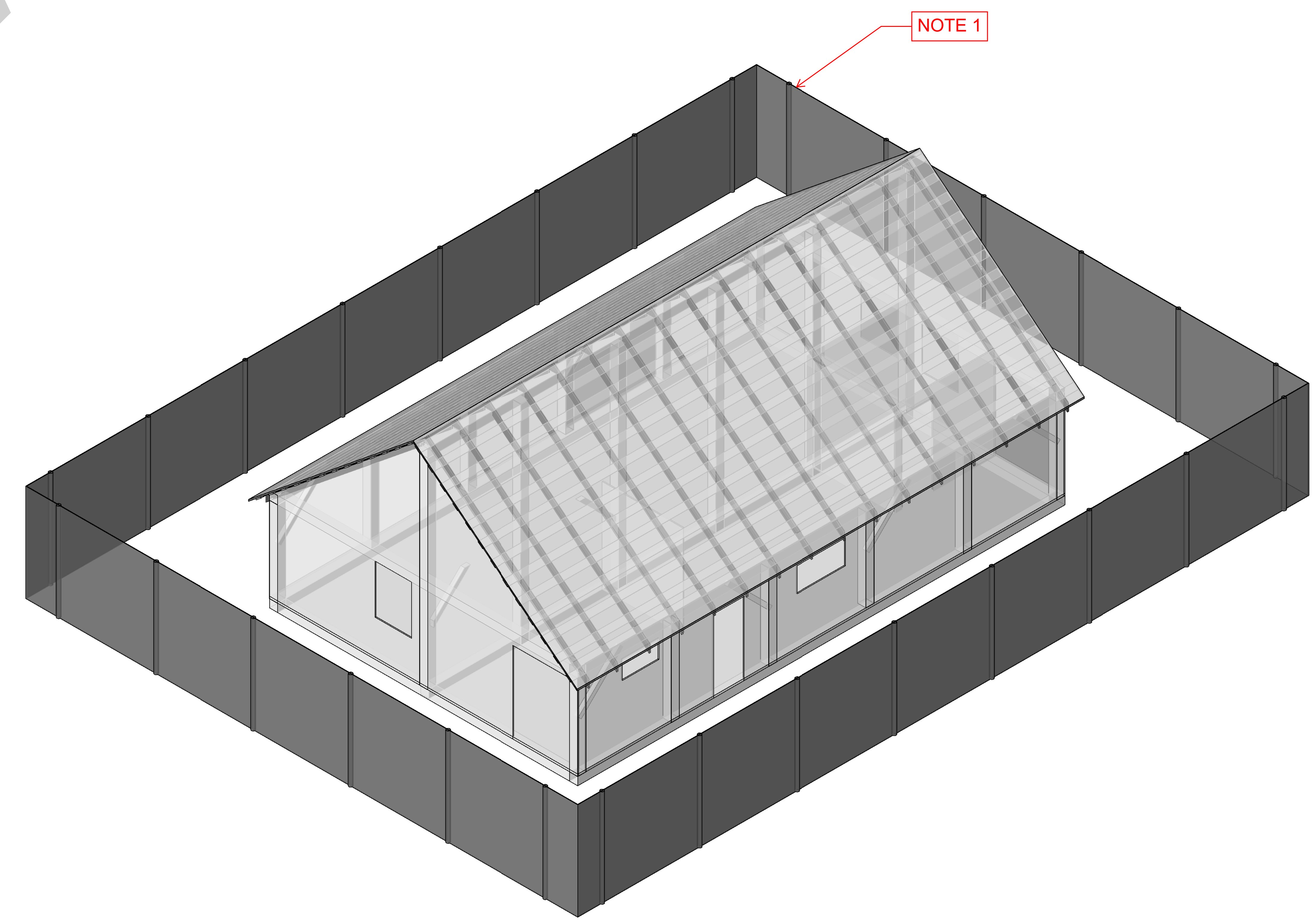


NORTH

ROOF FRAMING PLAN BOD OPTION 1

1/4" = 1'-0"

PRINT TO 11x17



3 3D ISOMETRIC VIEW

BASIS OF DESIGN ALTERNATIVE 1:

1) Install a secure fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Assume two gated locations for maintenance personnel access.

2) Nesting bird surveys are required if work takes place between February 15 and August 30.

DRAFT

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

DYER BARN
BOD OPTION 1
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

FLOOR AND ROOF FRAMING PLANS

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

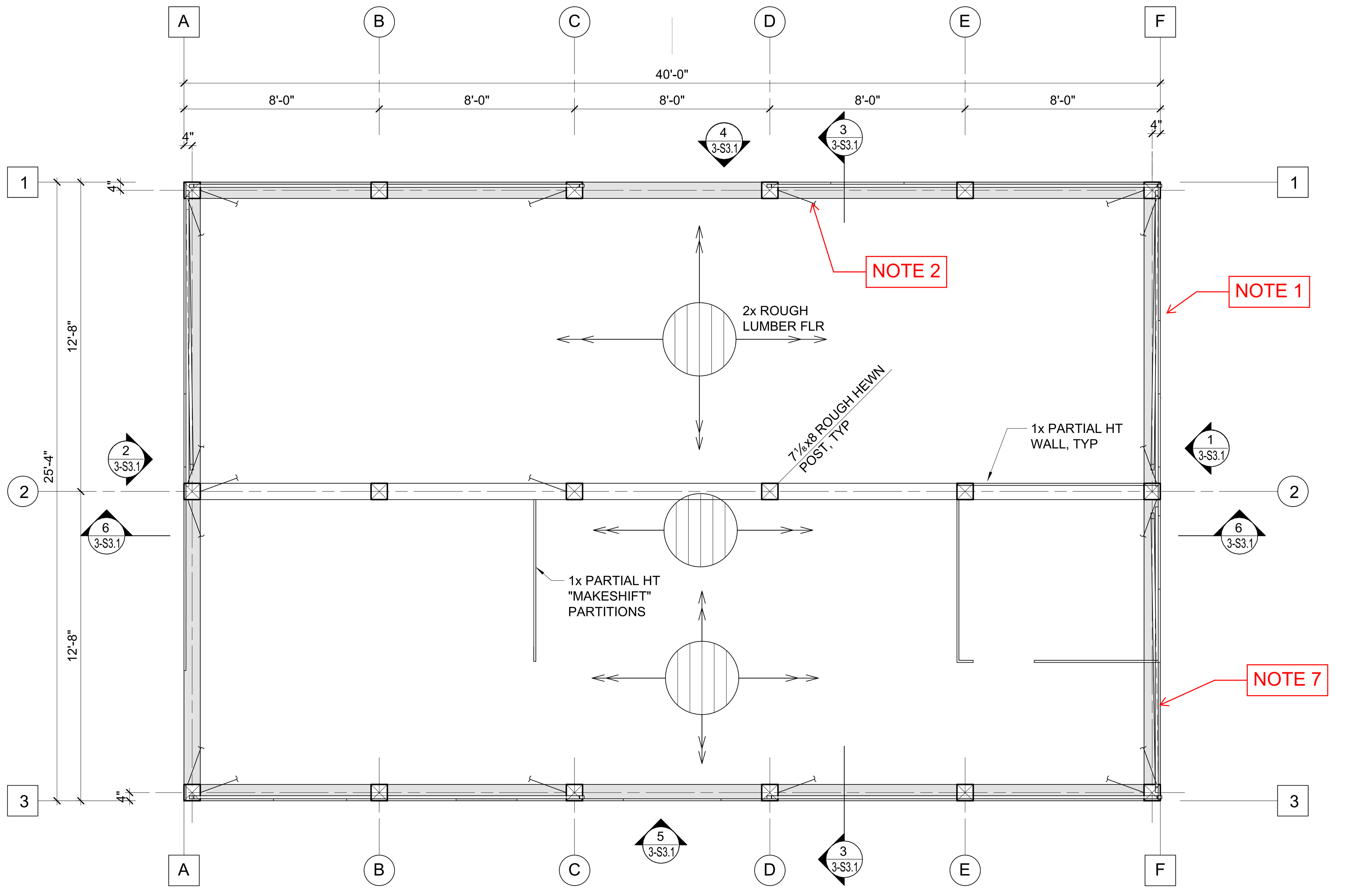
SHEET

1-S2.1

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

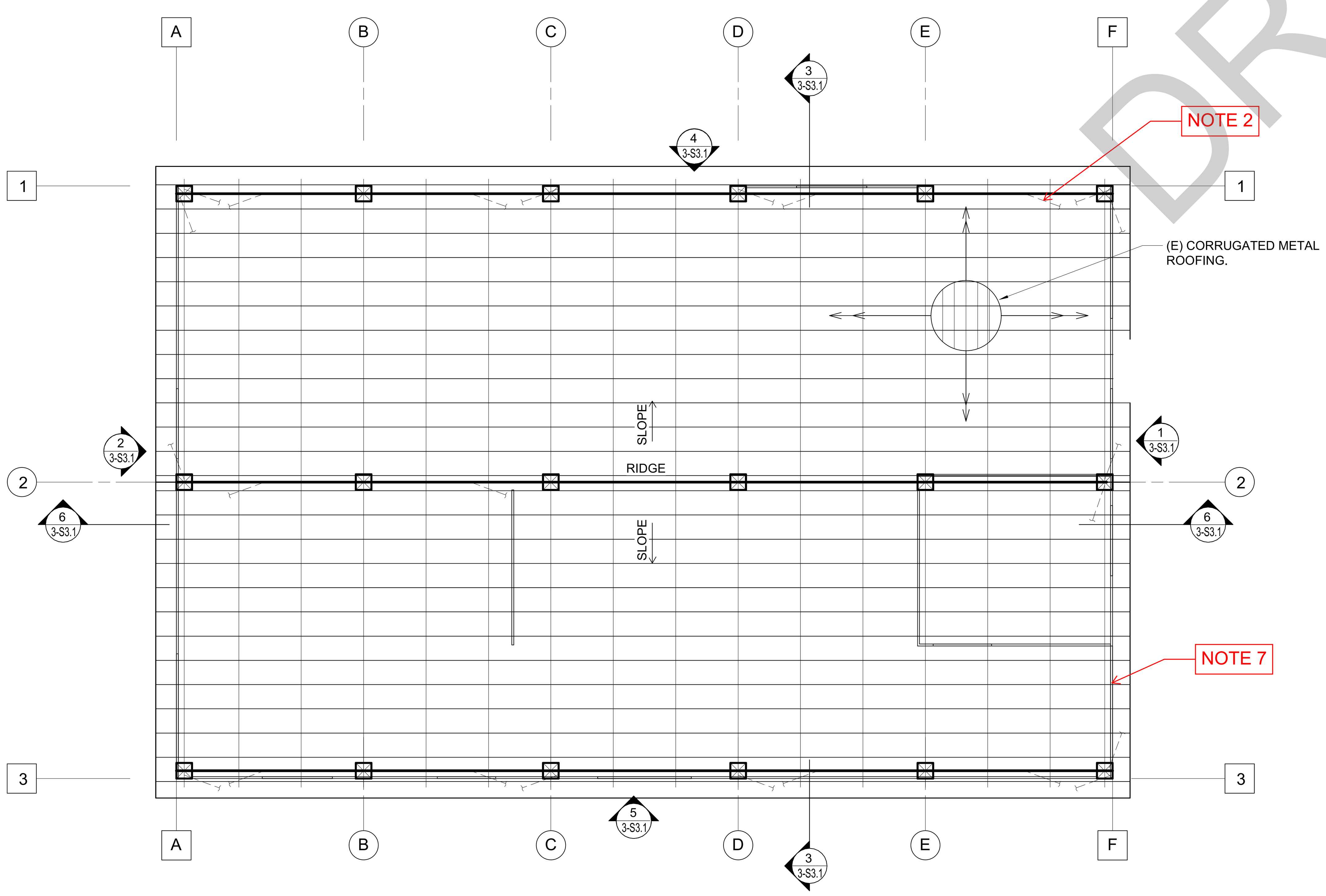
C:\revit_local\R2019\19235_La Honda_White Barn_S19C_leos@zfa.com.rvt
11/22/2019 1:49:34 PM

Attachment 2



FLOOR PLAN BOD OPTION 2

1/4" = 1'-0"



ROOF FRAMING PLAN BOD OPTION 2

1/4" = 1'-0"

PRINT TO 11x17

C:\revit_local\R2019\19235_La Honda_White Barn_S19C_leos@zfa.com.rvt

11/22/2019 1:48:41 PM

BASIS OF DESIGN ALTERNATIVE 2:

1) Install pressure treated blocking/shims at locations of deteriorated wood grade beams to prevent further settlement of the superstructure and deterioration of the foundation.

2) Provide wood cross bracing at the interior of exterior walls.

3) The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.

4) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a) Secure the building and its component features to reduce vandalism or break-ins.
b) Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
c) Provide adequate ventilation to the interior.
d) Develop and implement a maintenance and monitoring plan for protection.

5) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

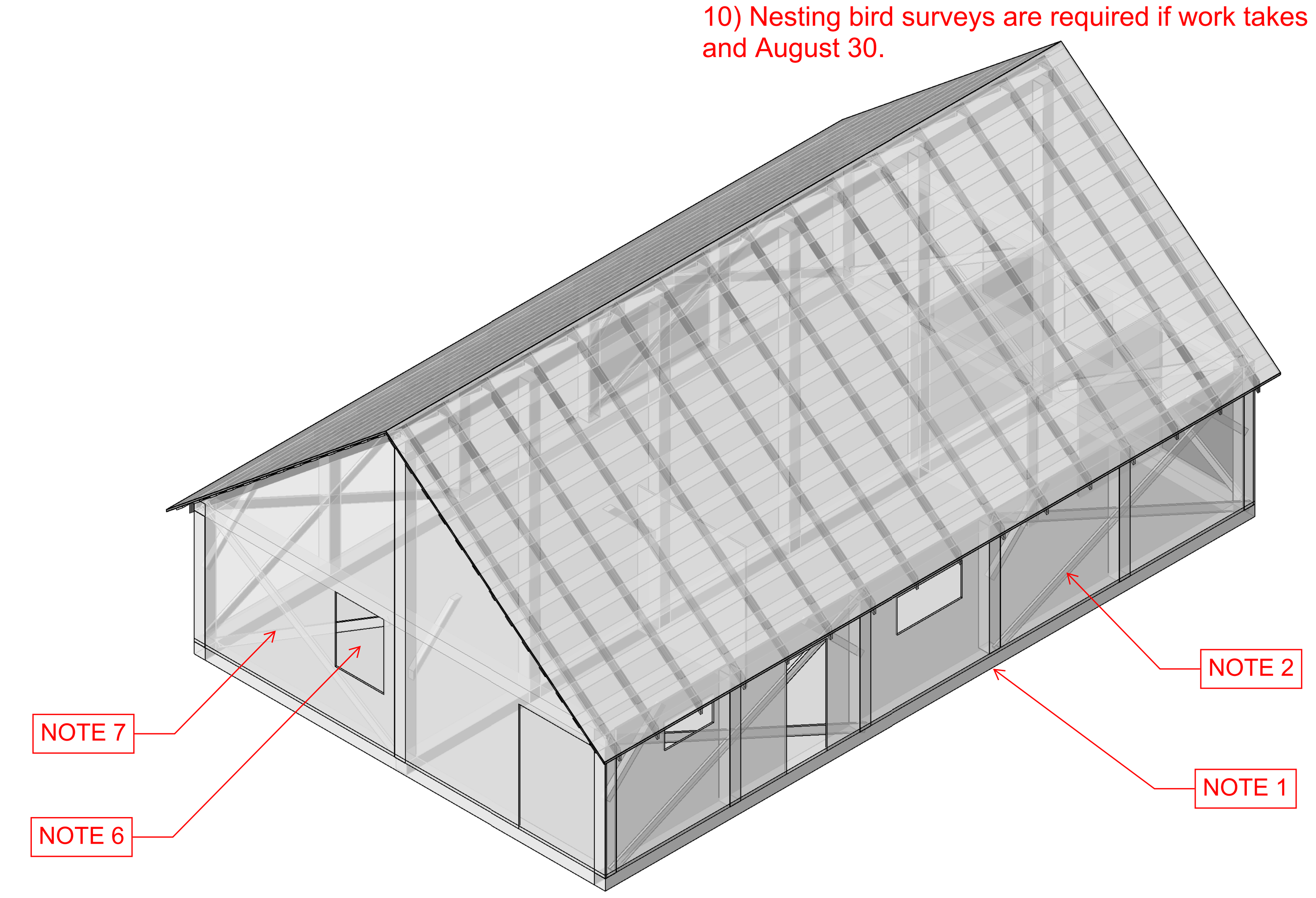
6) Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements. Fenestration that is currently boarded-up from the exterior should be repaired, and openings covered with clear Lexan to allow for viewing of the historic interior. The non-historic plywood should also be removed.

7) Remove peeling, loose lead-containing paint from the exterior of the Barn. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to protect the historic redwood cladding from the elements. The preparation of the substrate for painting should be gentle, it is not recommended that the existing texture of the wood be significantly altered. The condition of the coating should be inspected annually, and the building will likely require repainting every 7-10 years to maintain a sound coating on the wood.

8) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

9) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

10) Nesting bird surveys are required if work takes place between February 15 and August 30.



3 3D ISOMETRIC VIEW

DRAFT

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

DYER BARN
BOD OPTION 2
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

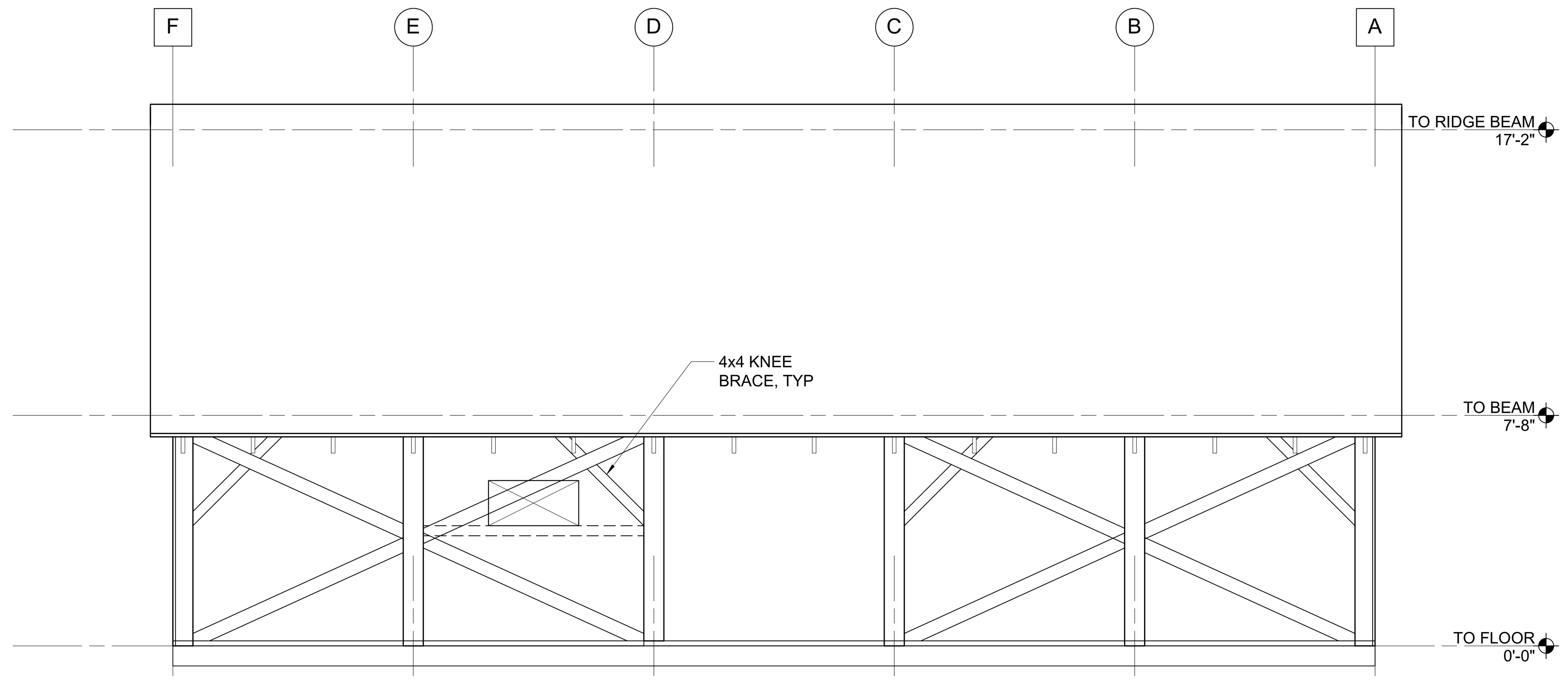
FLOOR AND ROOF FRAMING PLANS

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

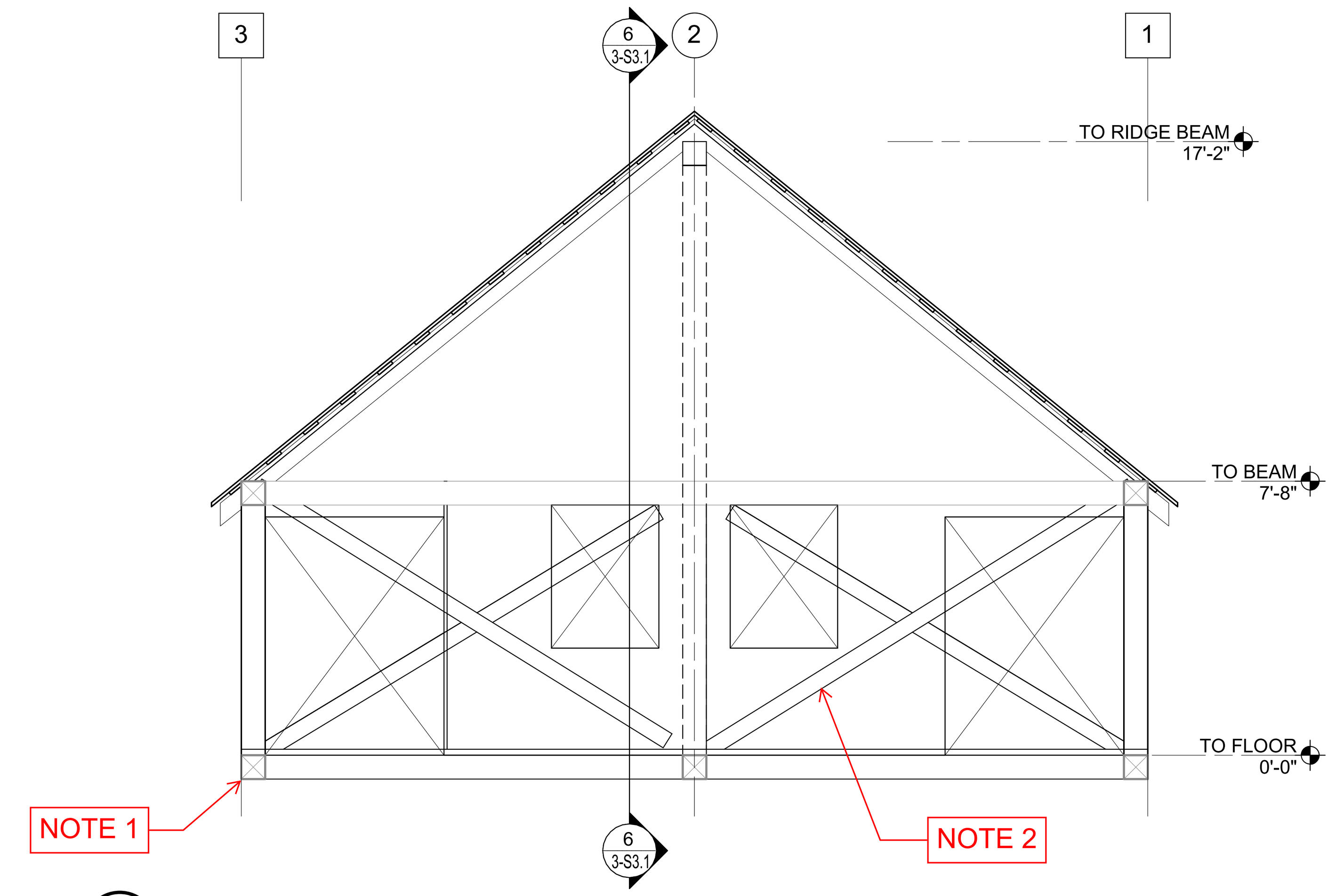
SHEET

2-S2.1

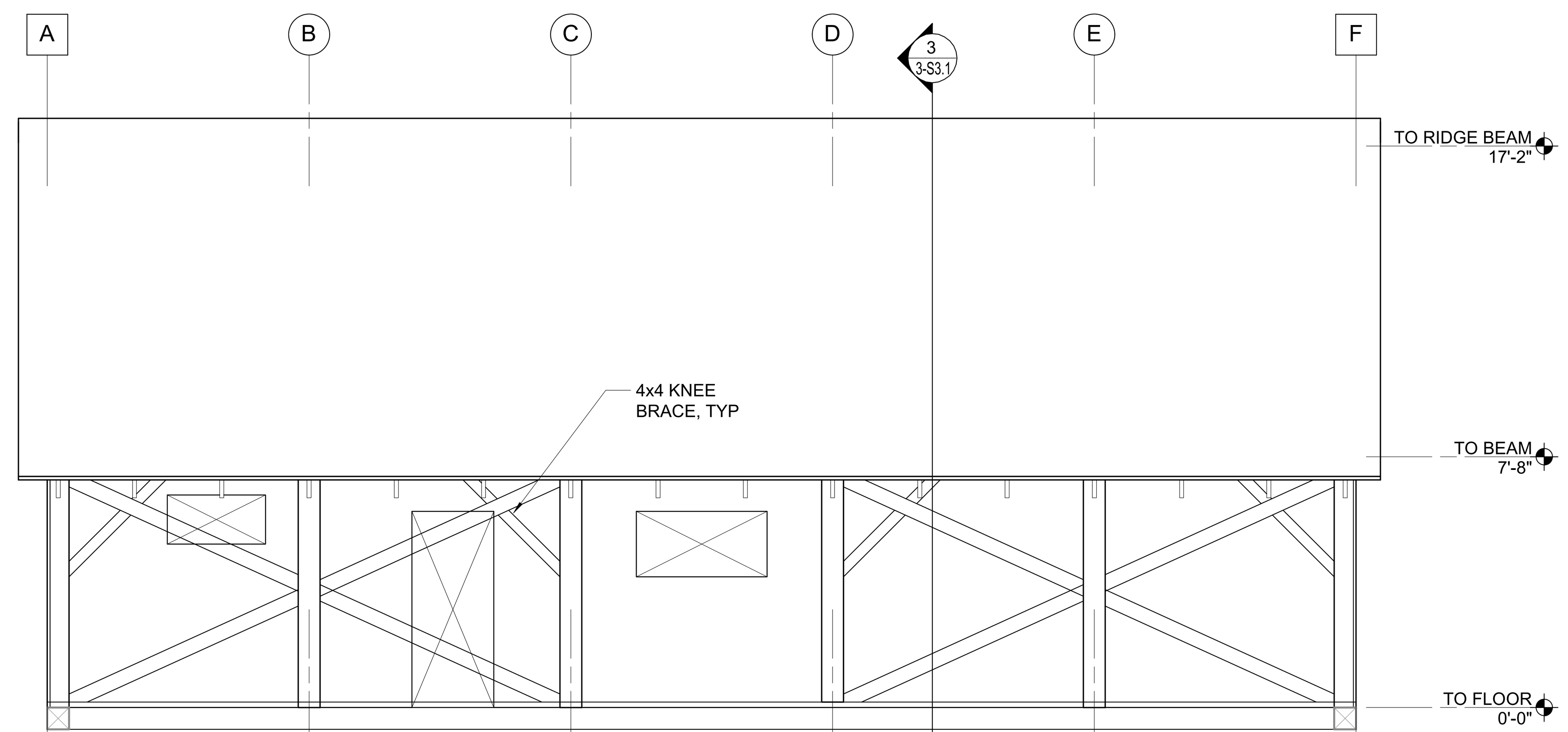
Attachment 2



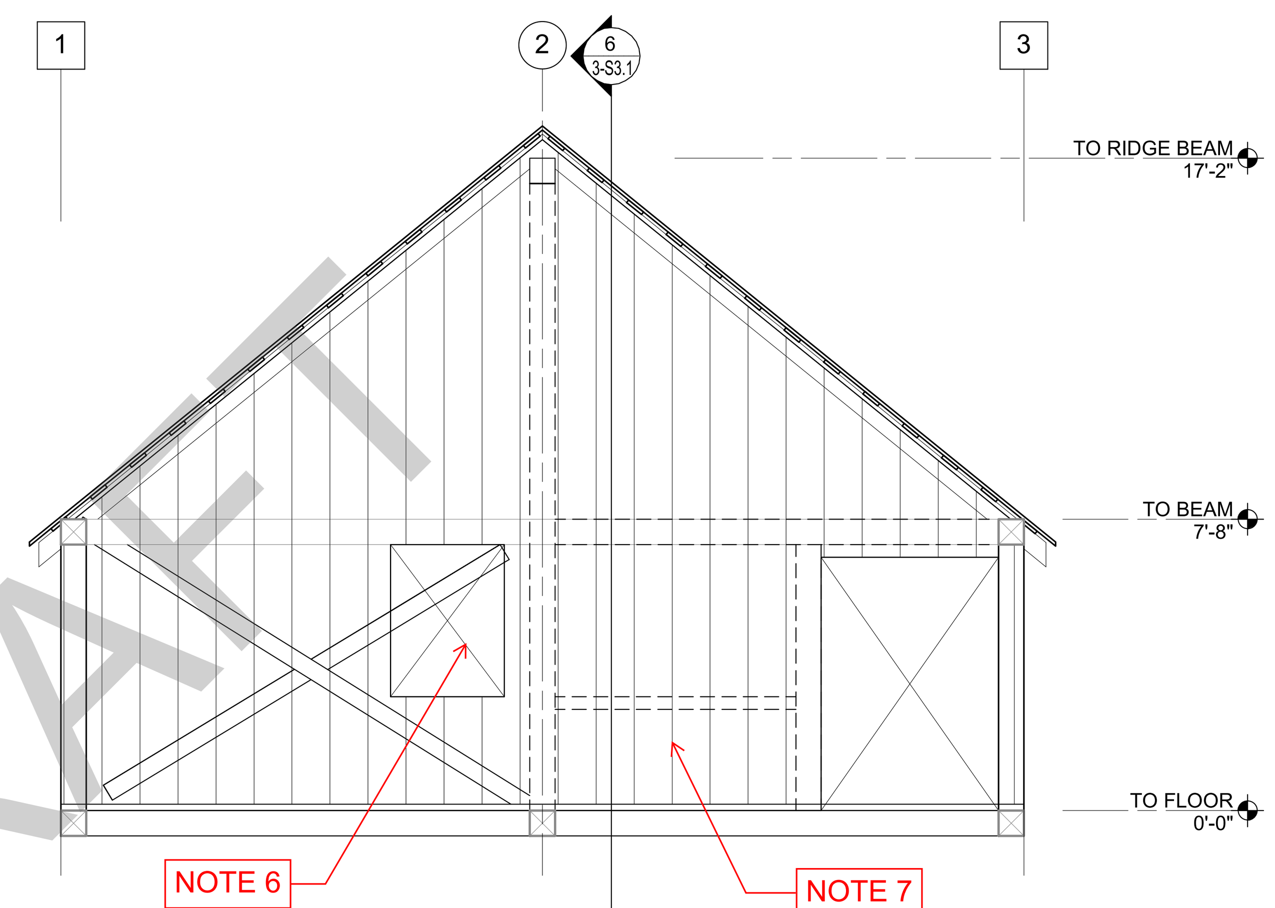
4 NORTH ELEVATION BOD OPTION 2
1/4" = 1'-0"



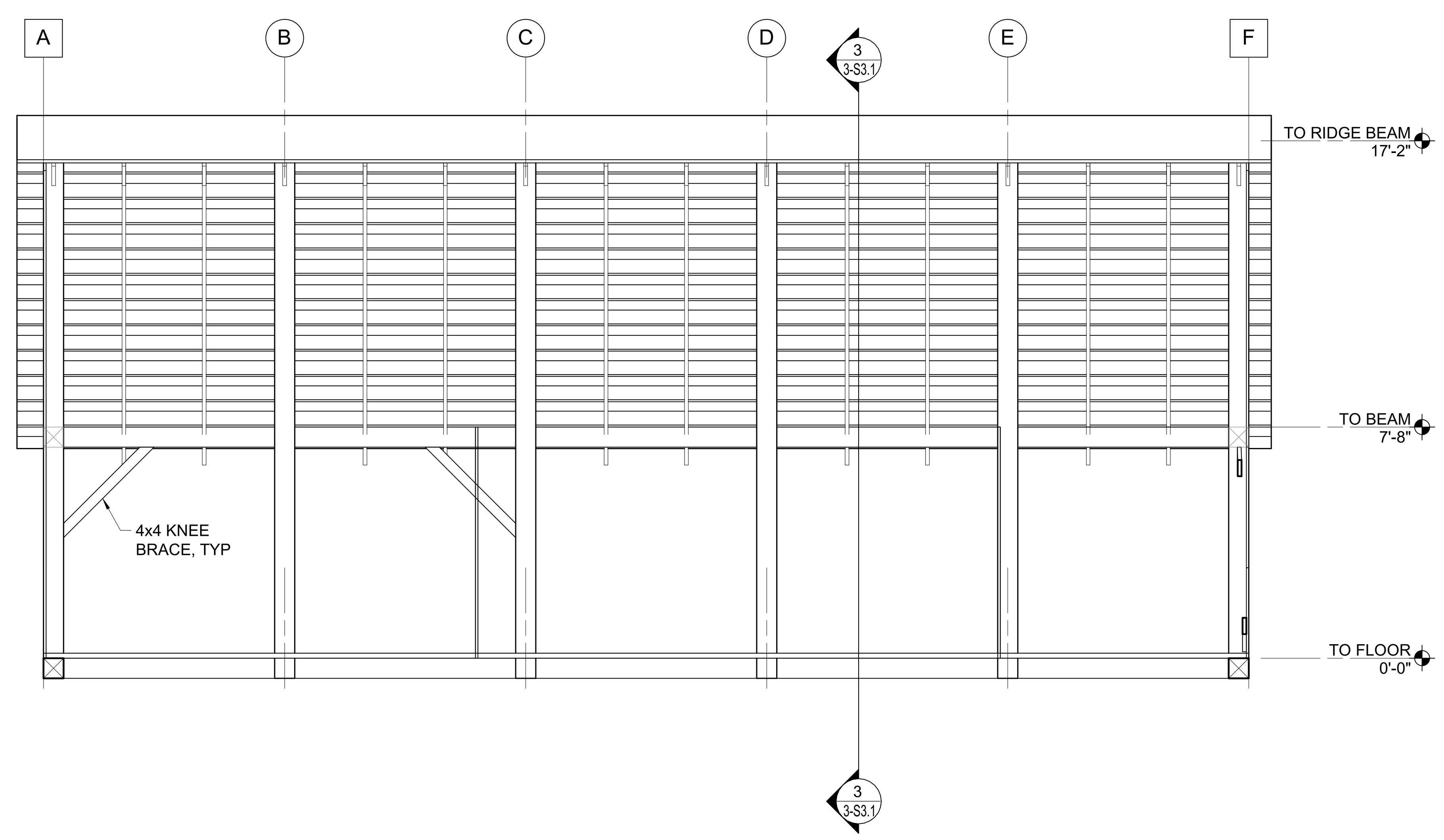
1 EAST ELEVATION BOD OPTION 2
1/4" = 1'-0"



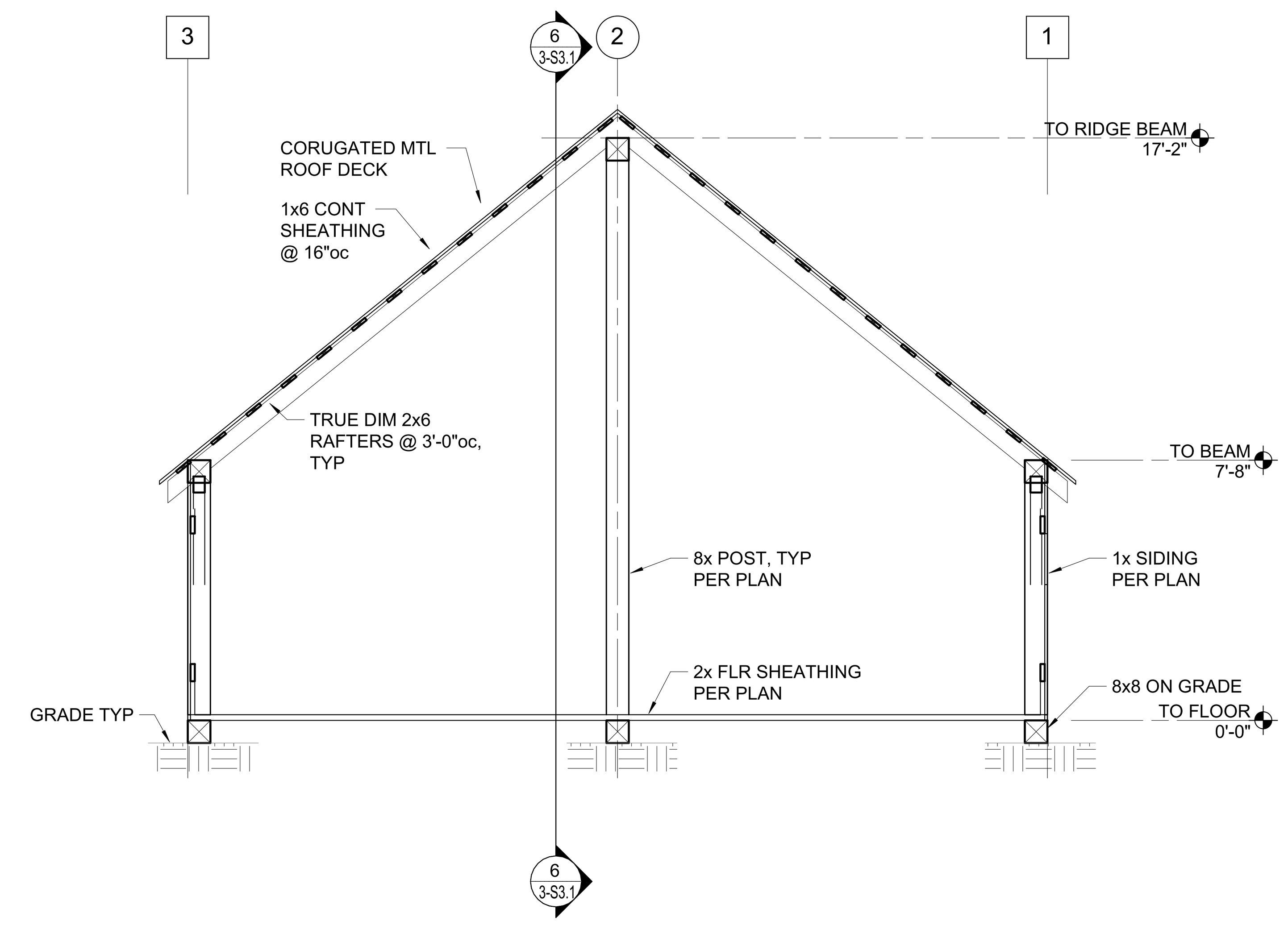
5 SOUTH ELEVATION BOD OPTION 2
1/4" = 1'-0"



2 WEST ELEVATION BOD OPTION 2
1/4" = 1'-0"



6 BUILDING SECTION - LONGITUDINAL BOD OPTION 2
1/4" = 1'-0"



3 BUILDING SECTION - TRANSVERSE BOD OPTION 2
1/4" = 1'-0"

PRINT TO 11x17

C:\revit_local\R2019\19235_La Honda_White Barn_S19C_leos@zfa.com.rvt

11/22/2019 1:49:42 PM

BASIS OF DESIGN ALTERNATIVE 2:

1) Install pressure treated blocking/shims at locations of deteriorated wood grade beams to prevent further settlement of the superstructure and deterioration of the foundation.

2) Provide wood cross bracing at the interior of exterior walls.

3) The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.

4) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a) Secure the building and its component features to reduce vandalism or break-ins.
b) Remove furnishings, trash, wildlife waste products and stored hazardous materials (i.e. poisons, paints, etc.) and ensure it is broom-clean.
c) Provide adequate ventilation to the interior.
d) Develop and implement a maintenance and monitoring plan for protection.

5) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

6) Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements. Fenestration that is currently boarded-up from the exterior should be repaired, and openings covered with clear Lexan to allow for viewing of the historic interior. The non-historic plywood should also be removed.

7) Remove peeling, loose lead-containing paint from the exterior of the Barn. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to protect the historic redwood cladding from the elements. The preparation of the substrate for painting should be gentle, it is not recommended that the existing texture of the wood be significantly altered. The condition of the coating should be inspected annually, and the building will likely require repainting every 7-10 years to maintain a sound coating on the wood.

8) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

9) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

10) Nesting bird surveys are required if work takes place between February 15 and August 30.

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

DYER BARN
BOD OPTION 2
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

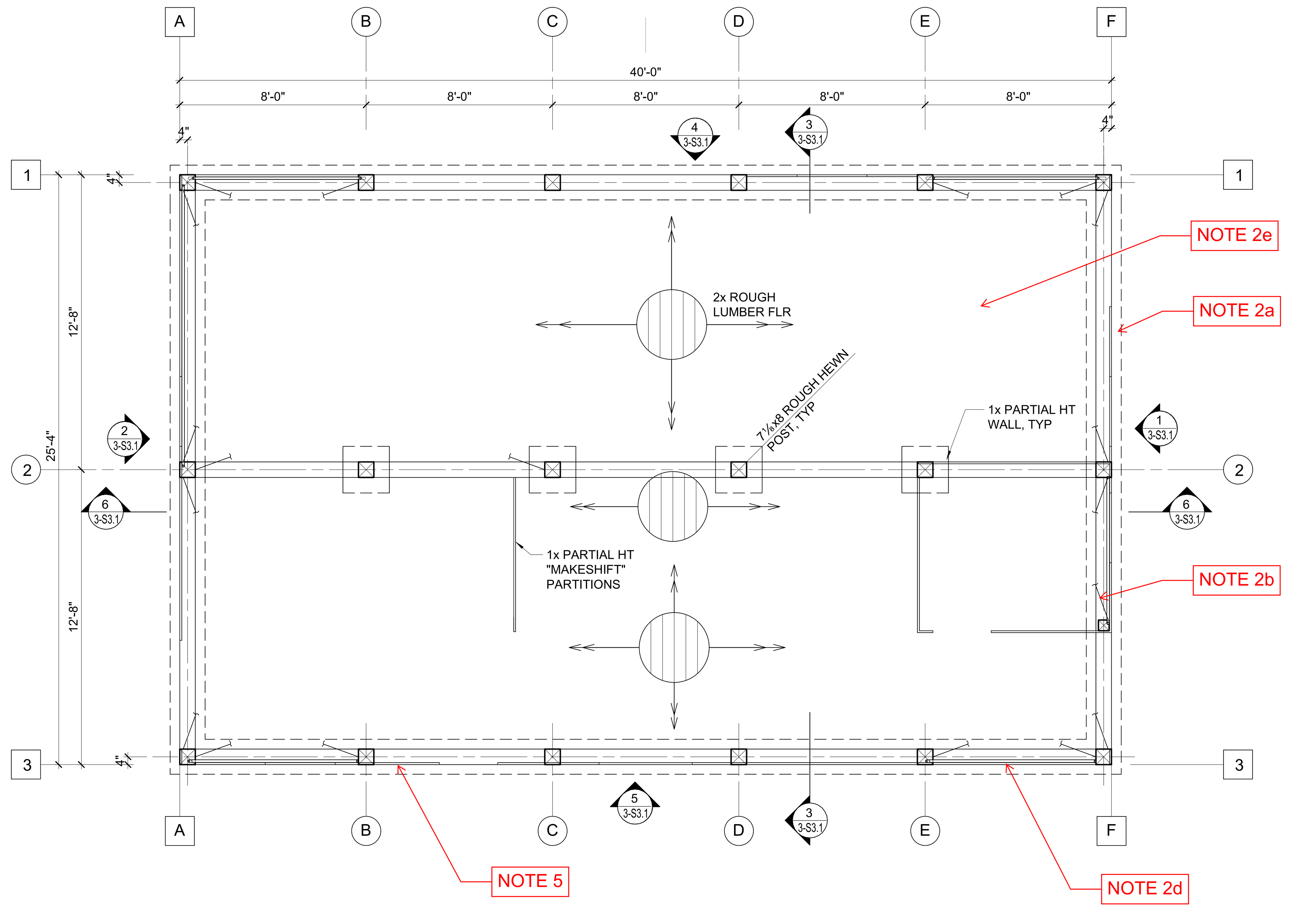
SHEET DESCRIPTION

ELEVATIONS & SECTIONS

ENGR: SRP
DATE: NOV 22, 2019
PM: SRP

SHEET

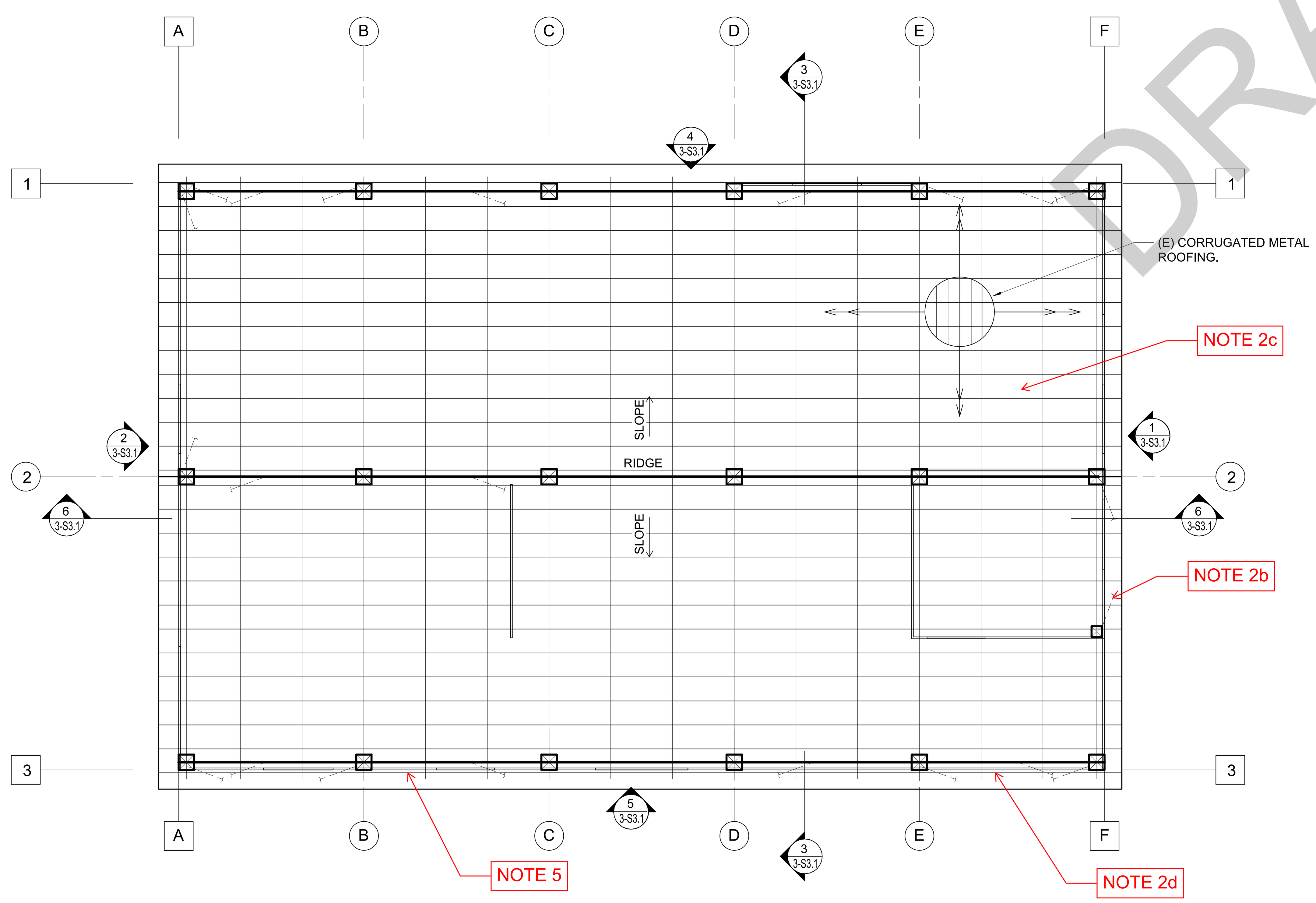
2-S3.1



NORTH

FLOOR PLAN BOD OPTION 3

1/4" = 1'-0"

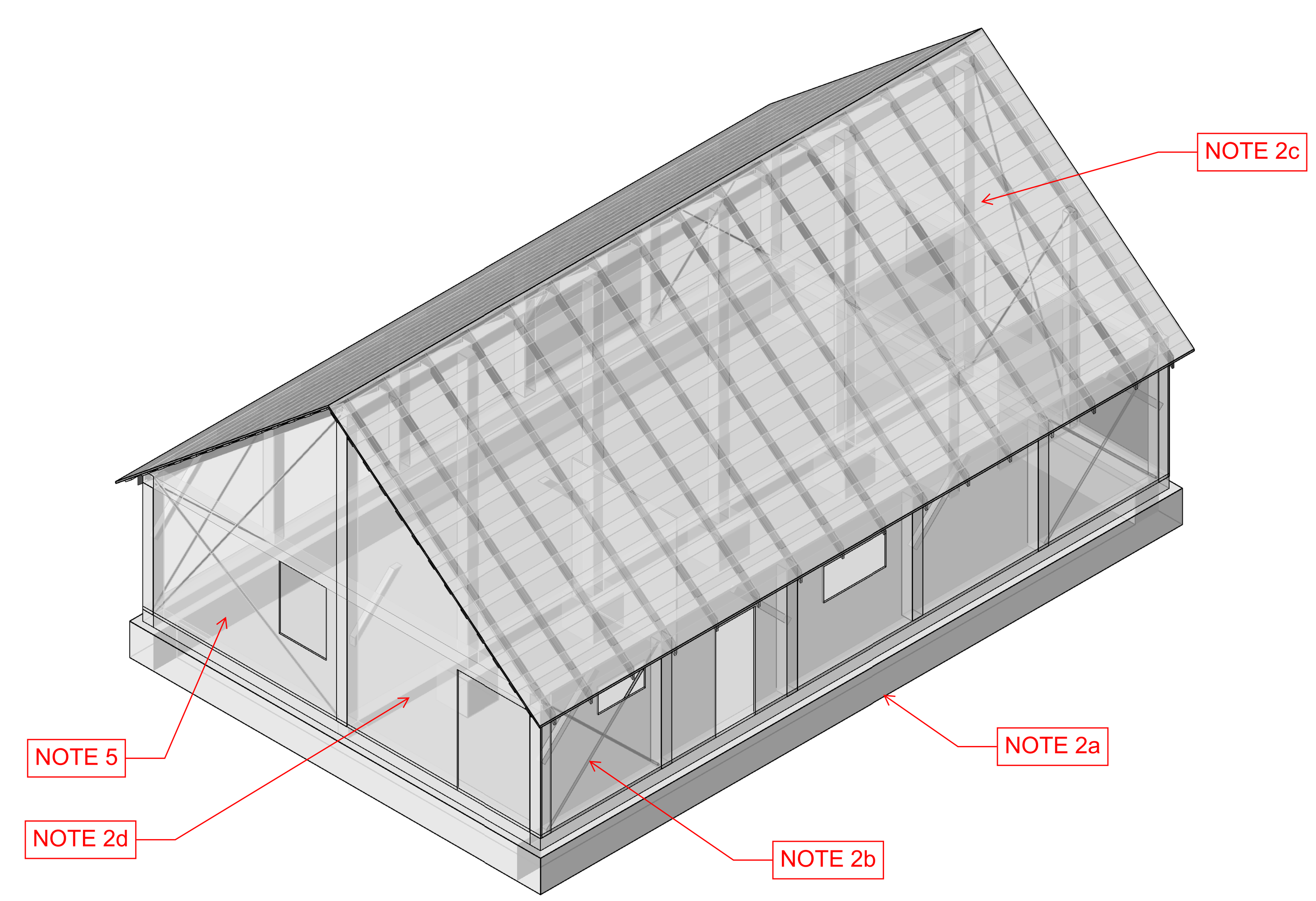


NORTH

ROOF FRAMING PLAN BOD OPTION 3

1/4" = 1'-0"

PRINT TO 11x17



1 3D ISOMETRIC VIEW

DRAFT

BASIS OF DESIGN ALTERNATIVE 3:

1) The stabilization methods proposed for this option target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code to allow for re-occupancy of the existing building. It is assumed there is no change of occupancy from the existing.

2) Provide new structural members including:
a) New concrete foundation
b) New vertical seismic force-resisting system
c) New roof diaphragm
d) Remove and replace deteriorated siding (assume 40% require repair).
e) New floor system

3) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

4) In addition to the envelope repair described in proposed project alternative #2 for the Barn, rehabilitating the building for a storage use should include the installation of interior lighting to meet code required minimums for safety.

5) Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule

6) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

7) Given the wooden construction of the building, it would be inadvisable to store any flammable materials within the barn, or any items that would increase the risk of fire or damage to the historic resource.

8) Care should be taken to protect the door framing from impact damage; install temporary protection if necessary, in a manner that does not attach directly to or otherwise damage the historic fabric of the barn.

9) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

10) Nesting bird surveys are required if work takes place between February 15 and August 30.

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 2

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

DYER BARN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

FLOOR AND ROOF FRAMING PLANS

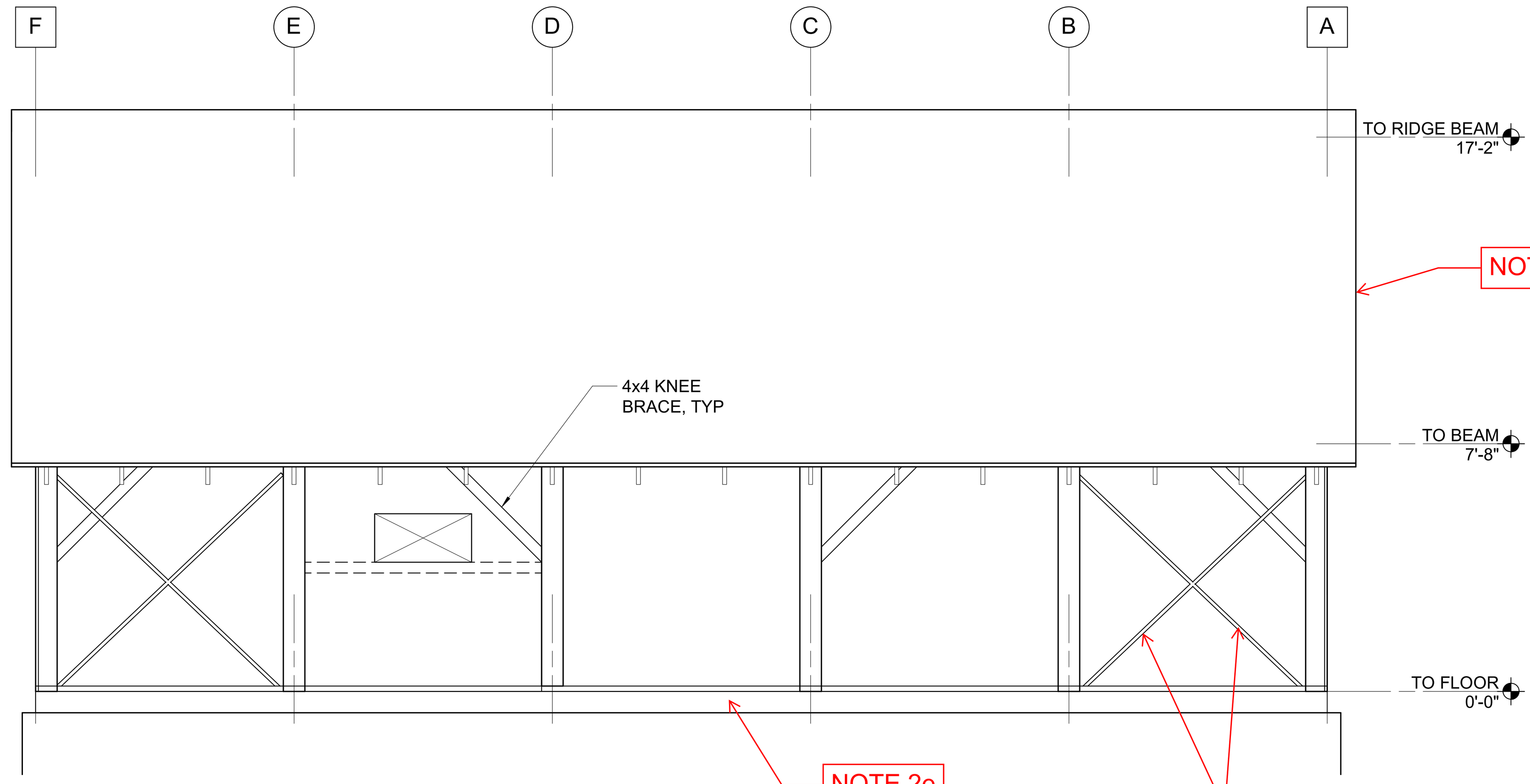
ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

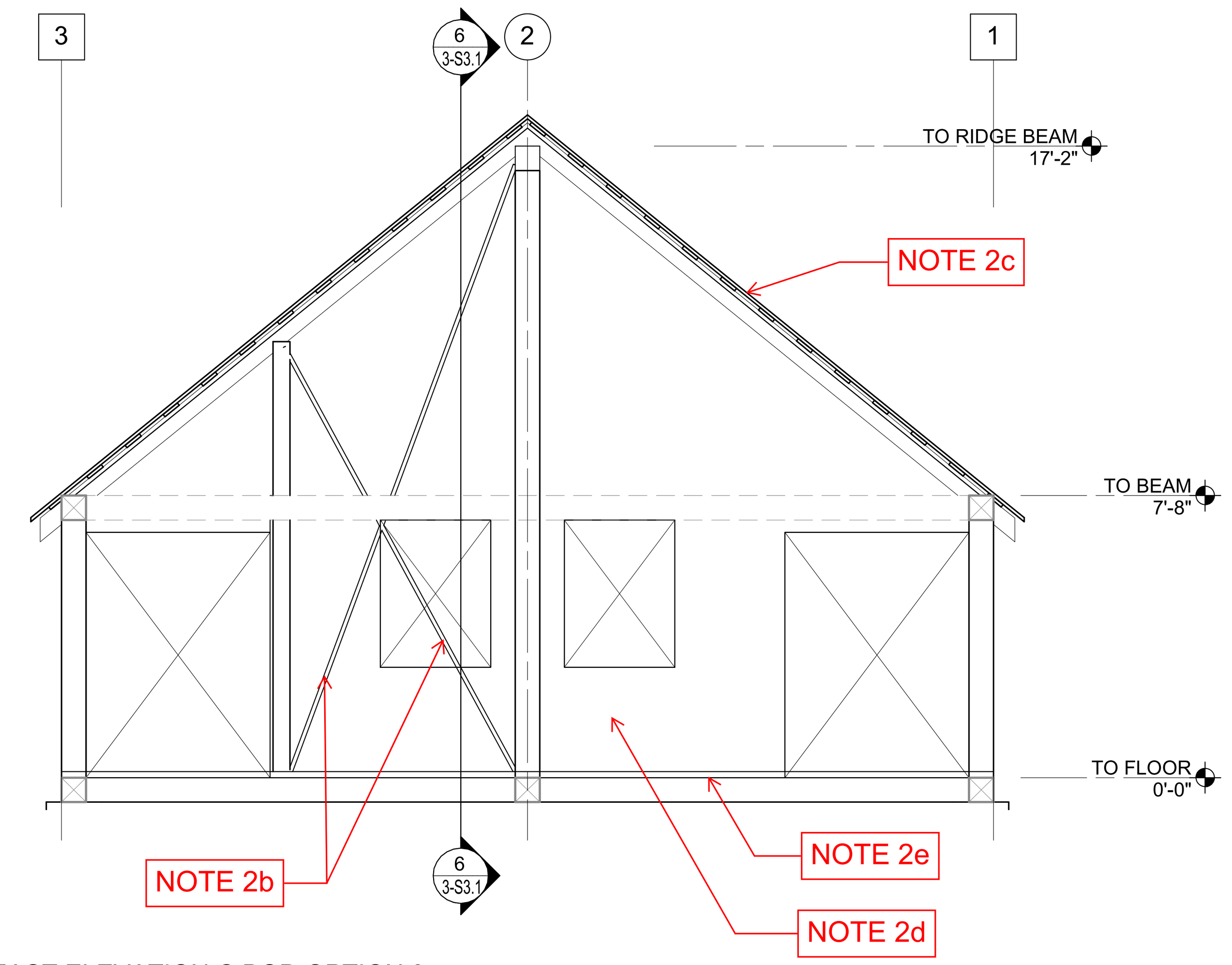
3-S2.1

C:\revit_local\R2019\19235_La Honda_White Barn_S19C_leos@zfa.com.rvt

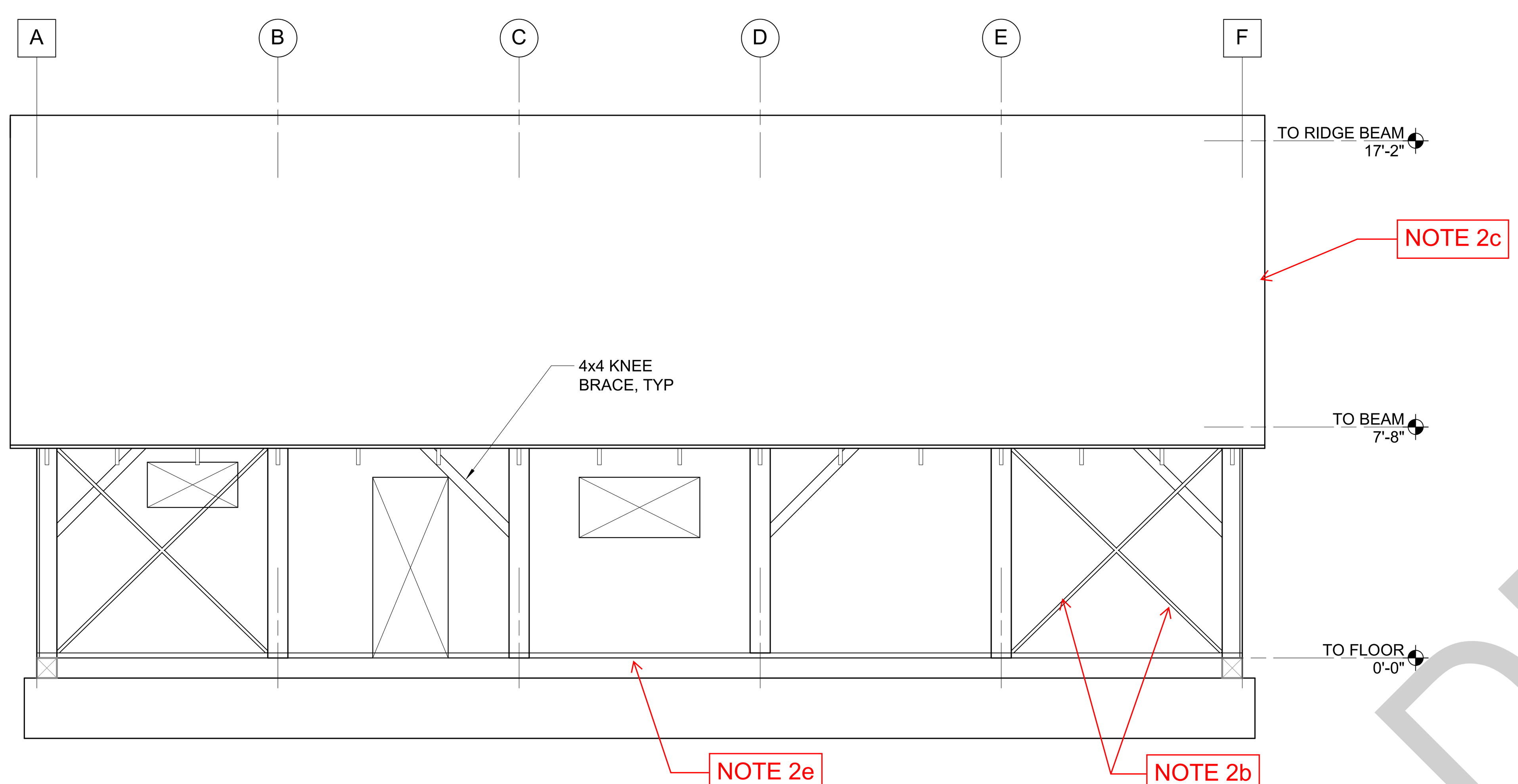
11/22/2019 1:49:45 PM



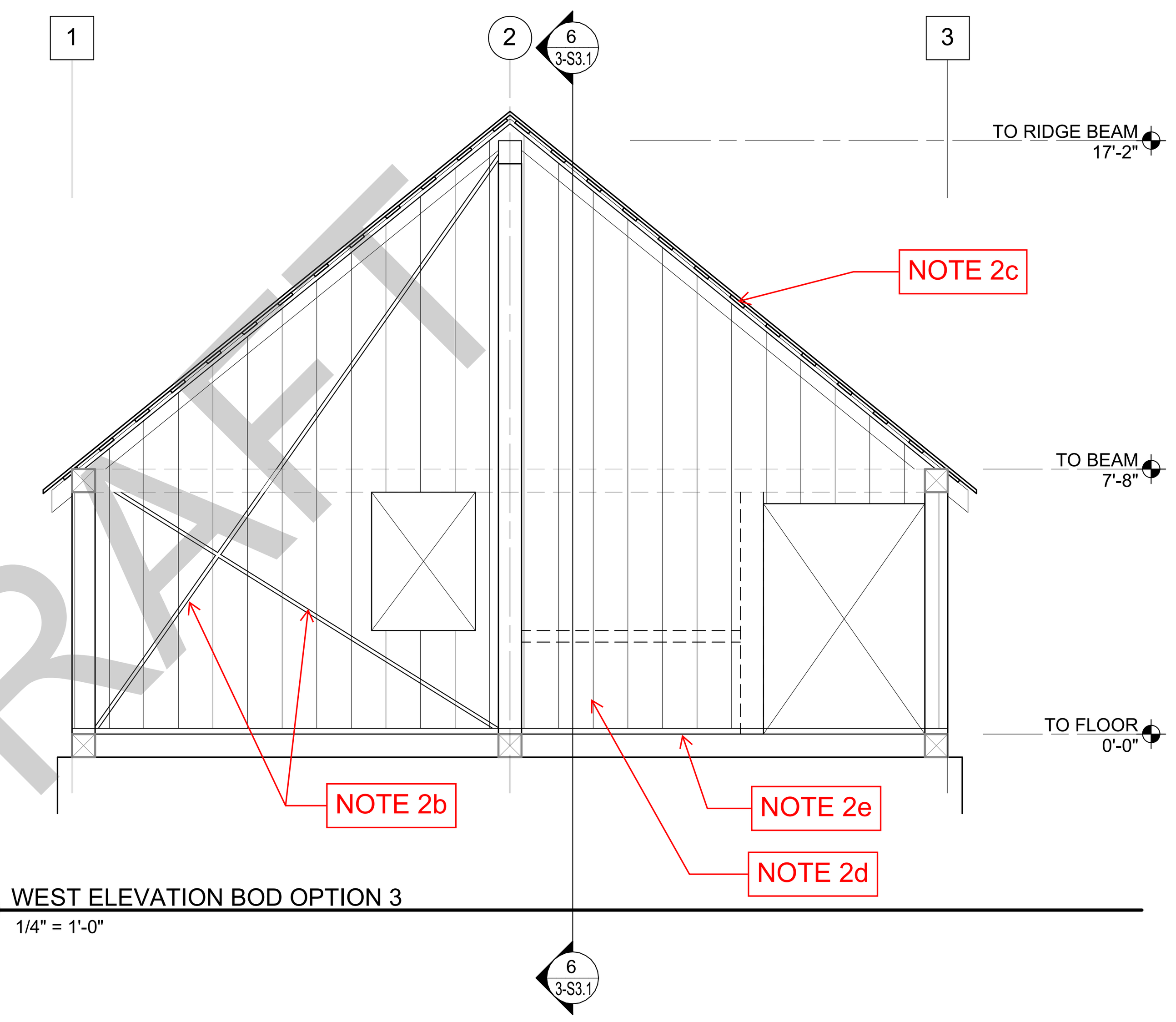
4 NORTH ELEVATION BOD OPTION 3
1/4" = 1'-0"



1 EAST ELEVATION C BOD OPTION 3
1/4" = 1'-0"

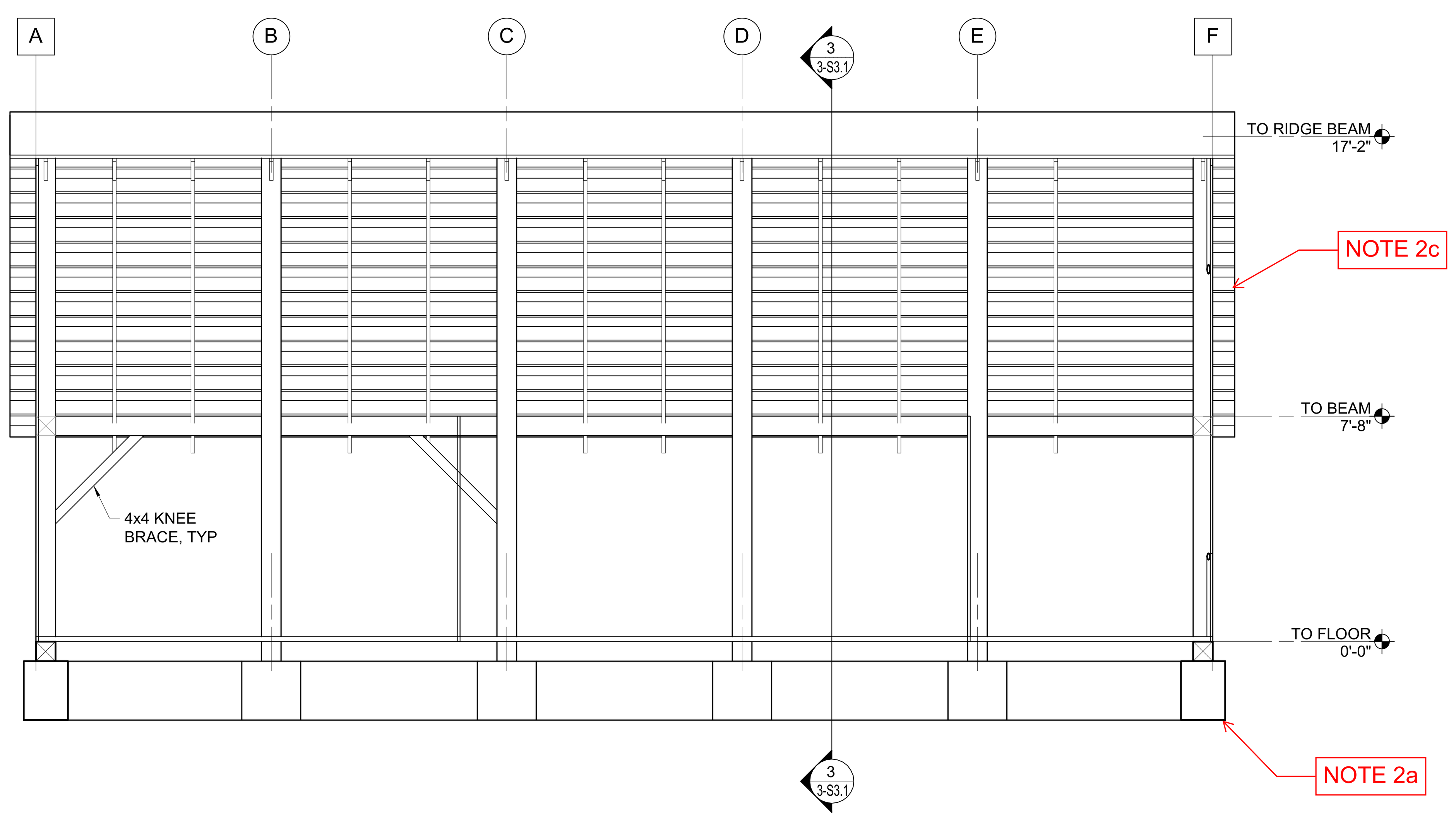


5 SOUTH ELEVATION BOD OPTION 3
1/4" = 1'-0"

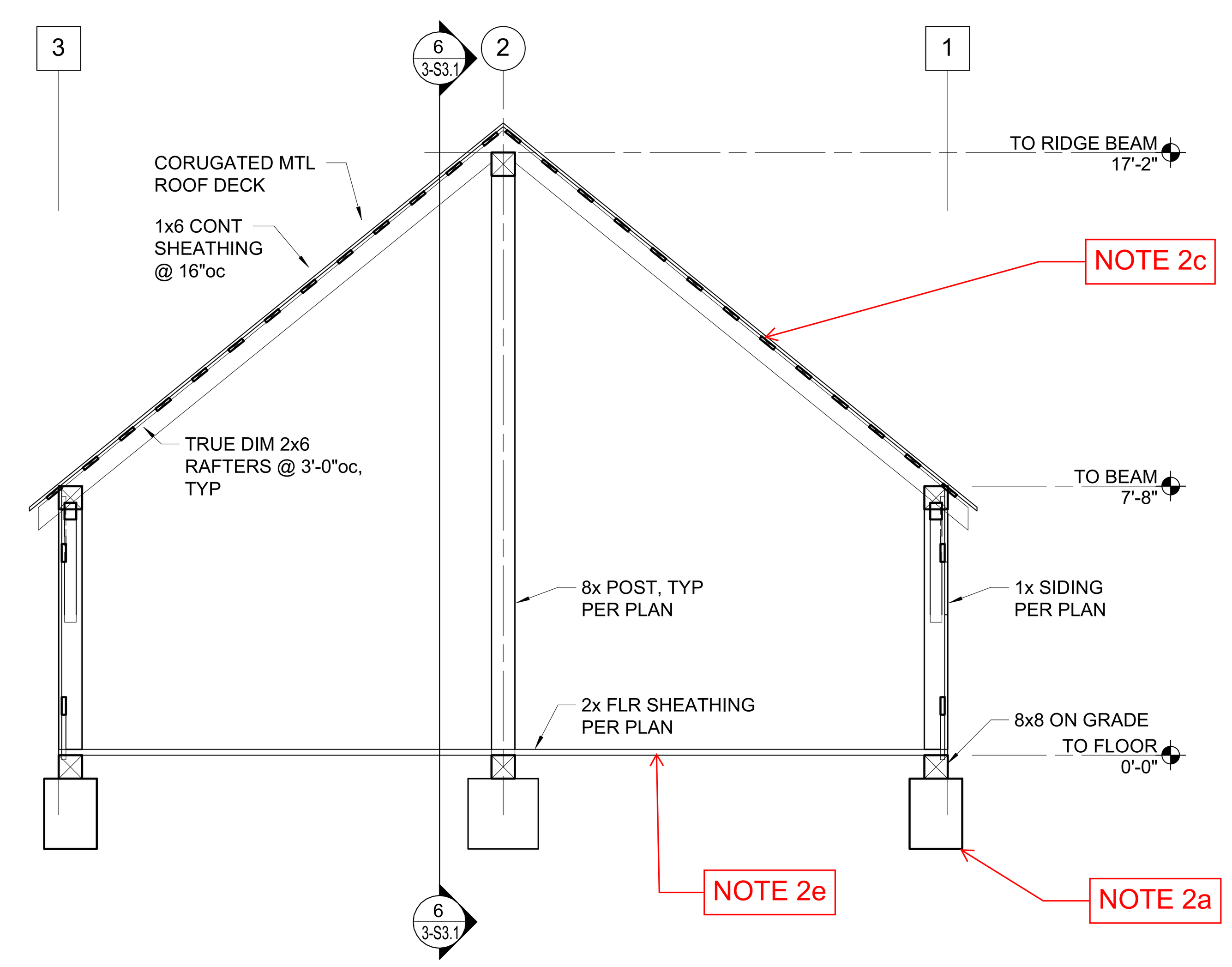


2 WEST ELEVATION BOD OPTION 3
1/4" = 1'-0"

DRAFT



6 BUILDING SECTION - LONGITUDINAL BOD OPTION 3
1/4" = 1'-0"



3 BUILDING SECTION - TRANSVERSE BOD OPTION 3
1/4" = 1'-0"

PRINT TO 11x17

BASIS OF DESIGN ALTERNATIVE 3:

1) The stabilization methods proposed for this option target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code to allow for re-occupancy of the existing building. It is assumed there is no change of occupancy from the existing.

2) Provide new structural members including:
a) New concrete foundation
b) New vertical seismic force-resisting system
c) New roof diaphragm
d) Remove and replace deteriorated siding (assume 40% require repair).
e) New floor system

3) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

4) In addition to the envelope repair described in proposed project alternative #2 for the Barn, rehabilitating the building for a storage use should include the installation of interior lighting to meet code required minimums for safety.

5) Remove lead-containing paint. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule

6) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

7) Given the wooden construction of the building, it would be inadvisable to store any flammable materials within the barn, or any items that would increase the risk of fire or damage to the historic resource.

8) Care should be taken to protect the door framing from impact damage; install temporary protection if necessary, in a manner that does not attach directly to or otherwise damage the historic fabric of the barn.

9) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

10) Nesting bird surveys are required if work takes place between February 15 and August 30.

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

DYER BARN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

ELEVATIONS & SECTIONS

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

3-S3.1

Attachment 2

BASIS OF DESIGN ALTERNATIVE 4:

1) Demolishing the structure, which has been determined an historic resource, may require additional processes to obtain demolition permits.

2) Remove lead-containing paint prior to demolition. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. See Exhibit D.

3) Develop a replacement bat maternity roost habitat plan for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
4) The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.

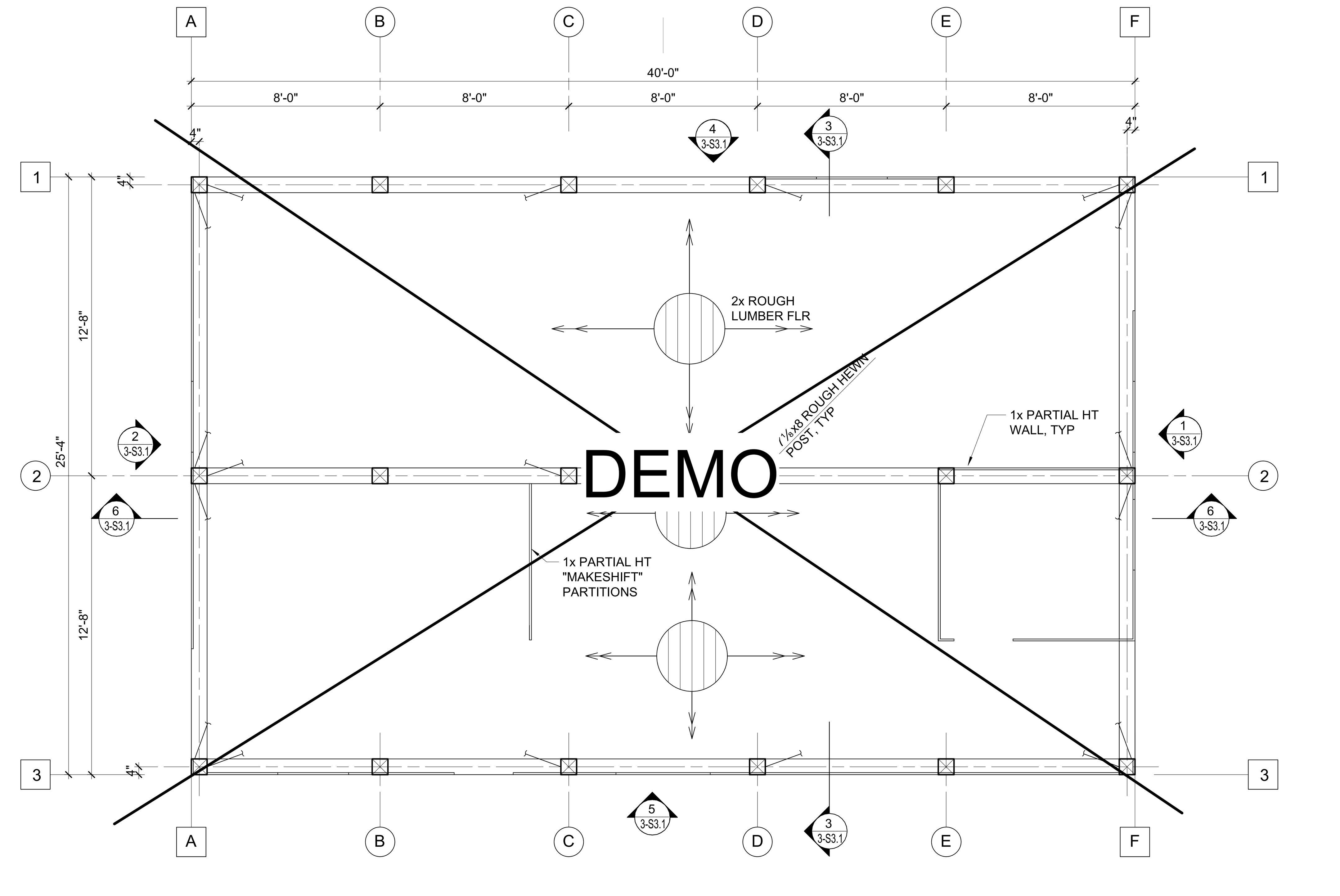
5)Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site should also be considered.

6) The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.

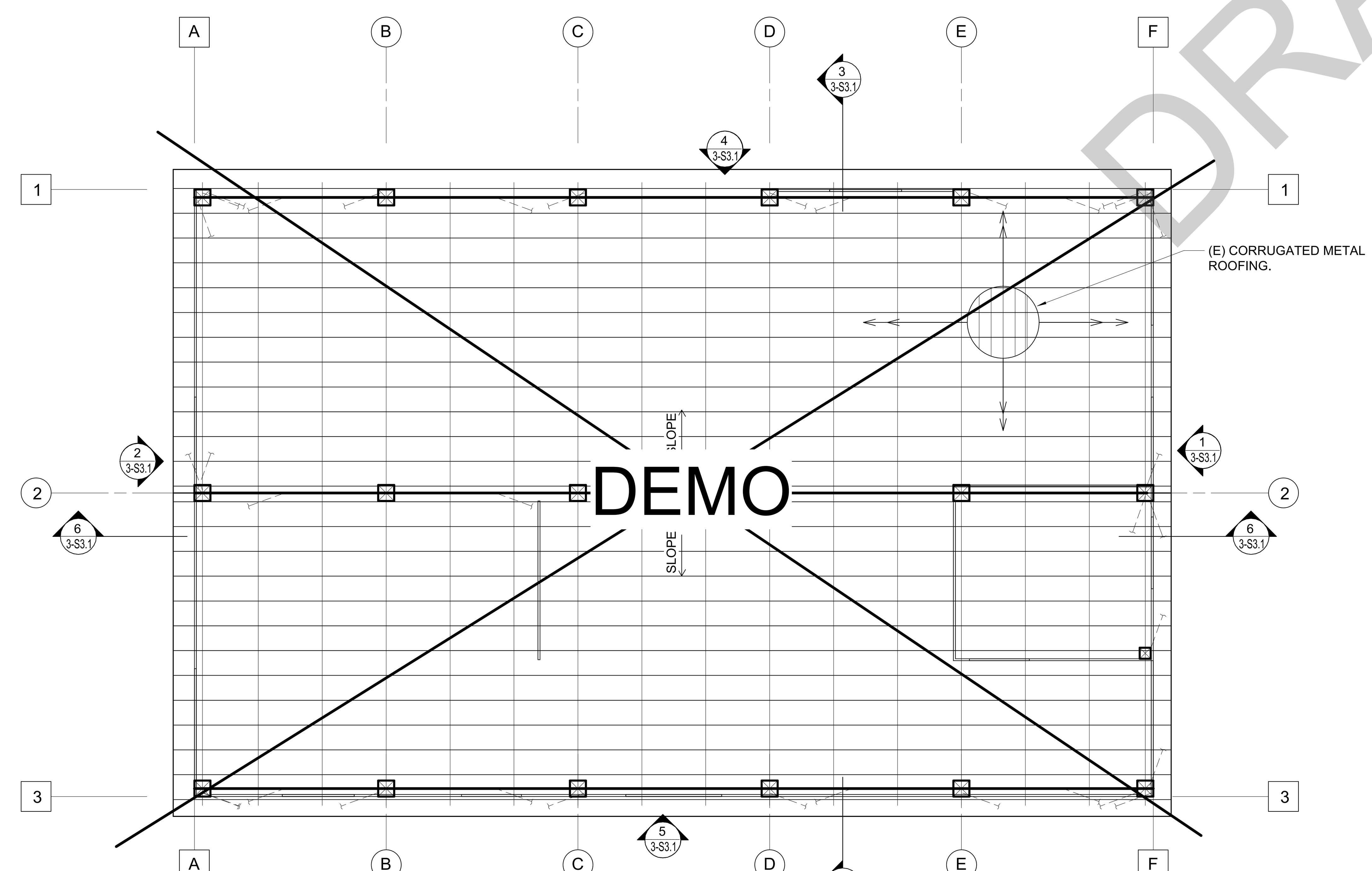
7) Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

8) Due to the relatively small size of the structure, the District may consider dismantling and relocating the structure as an alternative to demolition.

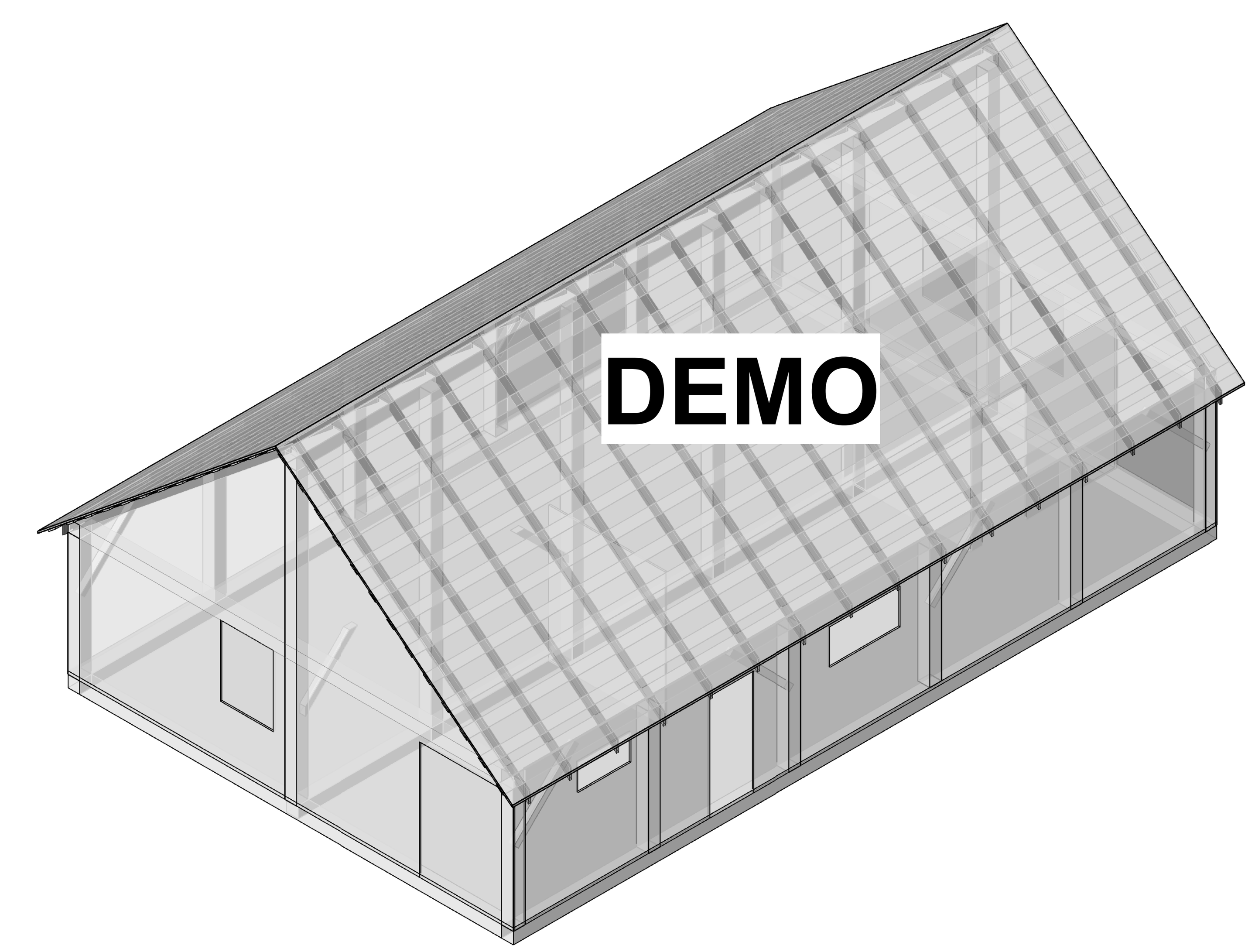
9) Nesting bird surveys are required if work takes place between February 15 and August 30.



FLOOR PLAN BOD OPTION 4
1/4" = 1'-0"



ROOF FRAMING PLAN BOD OPTION 4
1/4" = 1'-0"



3 3D ISOMETRIC VIEW

C:\revit_local\R2019\19235_La Honda_White Barn_S19C_leos@zfa.com.rvt

11/22/2019 1:49:51 PM

PRINT TO 11x17

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869
copyright © 2019

PROJECT

DYER BARN
BOD OPTION 4
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

FLOOR AND ROOF FRAMING PLANS

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET
4-S2.1

DRAFT

APPENDIX C – SUMMARY DATA SHEET

Summary Data Sheet

BUILDING DATA

Building Name:	White Barn	Date:	10/3/19
Building Address:	La Honda Creek Open Space Preserve		
Latitude:	37.3777	Longitude:	-122.2798
By:			

Year Built:	1860's	Year(s) Remodeled:	N/A	Original Design Code:	None
Area (sf):	960	Length (ft):	40	Width (ft):	25
No. of Stories:	1	Story Height (ft):	8 to 18	Total Height (ft):	18

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☑ Other: Storage

CONSTRUCTION DATA

Gravity Load Structural System:	Timber Post and Beam		
Exterior Transverse Walls:	Vertical Siding	Openings?	Yes
Exterior Longitudinal Walls:	Vertical Siding	Openings?	Yes
Roof Materials/Framing:	Wood rafters with skip sheathing and corrugated metal		
Intermediate Floors/Framing:	N/A		
Ground Floor:	Wood straight sheathing on framing		
Columns:	8x8	Foundation:	Wood on ground
General Condition of Structure:	Poor to Fair		
Levels Below Grade?	none		
Special Features and Comments:			

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	N/A	N/A
Vertical Elements:	N/A	N/A
Diaphragms:	N/A	N/A
Connections:	N/A	N/A

EVALUATION DATA

BSE-1N Spectral Response Accelerations:	S_{DS}=	1.556	S_{D1}=	0.97		
Soil Factors:	Class=	C	F_a=	1.0	F_v=	null
BSE-2E Spectral Response Accelerations:	S_{XS}=	1.991	S_{X1}=	1.351		
Level of Seismicity:		BSE-2E	Performance Level:	CP		
Building Period:	T=	Not determined				
Spectral Acceleration:	S_a=	1.991				
Modification Factor:	$C_mC_1C_2$=	1.300	Building Weight: W=	25k		
Pseudo Lateral Force:	$V=C_mC_1C_2S_aW$=	64.7k				

BUILDING CLASSIFICATION: **W1 – Wood Frames Commercial and Industrial**

REQUIRED TIER 1 CHECKLISTS	Yes	No
Basic Configuration Checklist	☑	☐
Building Type W2 Structural Checklist	☑	☐
Nonstructural Component Checklist	☐	☑

FURTHER EVALUATION REQUIREMENT: **Tier 2 analysis on (6) structural deficiencies**

Material Properties

To account for uncertainty in the as-built data, a knowledge factor, κ, is determined according to ASCE 41 Table 6-1. Where material properties are not listed in existing construction documents, a knowledge factor of κ=0.75 shall be applied to the component capacities for deformation-controlled and force-controlled actions.

			Default Value per ASCE 41, 4.2.3?	*Alternate Value Source?*
Concrete			Table (4-2)	
Foundation Footings:	f'_c=	2,000 psi	☑	
Slabs:	f'_c=	2,000 psi	☑	
Reinforcing Steel			Table (4-3)	
#3 Bars:	f_y=	40,000 psi	☑	
#4 Bars and Larger:	f_y=	40,000 psi	☑	
Carpentry				
Wall studs and light Framing Members		Site Harvested first growth Redwood		
Sheathing – Horizontal 1x lumber				
Sawn Lumber Posts, Timbers, beams and Stringers	Construction Grade			

APPENDIX D – TIER 1 CHECKLISTS AND STRUCTURAL CALCULATIONS

TIER 1 CHECKLISTS

Table 17-1. Very Low Seismicity Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Structural Components

☐ C ☑ NC ☐ N/A ☐ U	*LOAD PATH: The structure contains a complete, well-defined load path,including structural elements and connections, that serves to transfer theinertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
☐ C ☐ NC ☑ N/A ☐ U	*WALL ANCHORAGE: Exterior concrete or masonry walls that are dependenton the diaphragm for lateral support are anchored for out-of-plane forcesat each diaphragm level with steel anchors, reinforcing dowels, or straps thatare developed into the diaphragm. Connections have adequate strength toresist the connection force calculated in the Quick Check procedure ofSection 4.4.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)*

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low Seismicity

Building System—General

☐ C ☑ NC ☐ N/A ☐ U	*LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
	There is no defined lateral force-resisting system.
☐ C ☐ NC ☑ N/A ☐ U	*ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25%of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)*
☐ C ☐ NC ☑ N/A ☐ U	*MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of themain structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)*

Building System—Building Configuration

☐ C ☐ NC ☑ N/A ☐ U	*WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)*
	One story building.
☐ C ☐ NC ☑ N/A ☐ U	*SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)*
	One story building.
☐ C ☐ NC ☑ N/A ☐ U	*VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)*
	One story building.
☐ C ☐ NC ☑ N/A ☐ U	*GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)*
	One story building.
☐ C ☐ NC ☑ N/A ☐ U	*MASS:There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)*
	One story building.
☑ C ☐ NC ☐ N/A ☐ U	*TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)*

Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Geologic Site Hazards

☑ C ☐ NC ☐ N/A ☐ U	*LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)*
☑ C ☐ NC ☐ N/A ☐ U	*SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)*
☑ C ☐ NC ☐ N/A ☐ U	*SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)*

High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)

Foundation Configuration

☑ C ☐ NC ☐ N/A ☐ U	*OVERTURNING:The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)*
☐ C ☐ NC ☑ N/A ☐ U	*TIES BETWEEN FOUNDATION ELEMENTS:The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)*
	No foundations are present.

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a
Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low and Moderate Seismicity
Seismic-Force-Resisting System

☐ C ☑ NC ☐ N/A ☐ U	*REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)* No shearwalls are present.
☐ C ☐ NC ☑ N/A ☐ U	*SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):* *Structural panel sheathing 1,000 lb/ft* *Diagonal sheathing 700 lb/ft* *Straight sheathing 100 lb/ft* *All other conditions 100 lb/ft* No shearwalls are present.
☐ C ☐ NC ☑ N/A ☐ U	*STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)* Only one story.
☐ C ☐ NC ☑ N/A ☐ U	*HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)*
☐ C ☐ NC ☑ N/A ☐ U	*CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)* No cripple walls.
☐ C ☐ NC ☑ N/A ☐ U	*OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)*

Connections

☐ C ☑ NC ☐ N/A ☐ U	*WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)* There is no foundation.

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

C	NC	N/A	U	
☐	☑	☐	☐	*WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)* Wood grade beams sit on the soil.
☐	☑	☐	☐	*GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)* None present by obsevation

High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)

Connections

C	NC	N/A	U	
☐	☑	☐	☐	*WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)* None present by observation

Diaphragms

C	NC	N/A	U	
☐	☐	☑	☐	*DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)*
☐	☑	☐	☐	*ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)*
☐	☐	☑	☐	*STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)*
☐	☐	☑	☐	*SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)* No wood diphragms present.
☐	☐	☑	☐	*DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)*
☐	☑	☐	☐	*OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)*

SEISMIC HAZARD ANALYSIS

ASCE 41-17 §2.4

Site Coordinates

Latitude =	37.3874	deg	White (Dyer) Barn Condition Assessment
Longitude =	-122.2781	deg	San Mateo County, California

Spectral Response Acceleration Parameters

ASCE 41-17 §2.4.1.4

Site Class =	C		Site Soil Classification
S_S =	0.842	g	Mapped Short-period Spectral Response Acceleration
S_1 =	0.307	g	Mapped 1-sec period Spectral Response Acceleration
S_{XS} =	0.980	g	Short-period Spectral Response Acceleration at BSE-1E
S_{X1} =	0.612	g	1-sec period Spectral Response Acceleration at BSE-1E

SEISMIC FORCE

ASCE 41-17 §4.5.2

Building Properties

Type N/S =	W1		Building Type in North-South Direction	*ASCE 41-17 Table 3-1*
Type E/W =	W1		Building Type in East-West Direction	*ASCE 41-17 Table 3-1*
Height, h_n =	25.00	ft	Height above base to roof level	
Stories =	1		Number of stories	
Weight N/S =	118.0	k	Seismic Weight of Building in North-South Direction	
Weight E/W =	118.0	k	Seismic Weight of Building in East-West Direction	

Building Period

ASCE 41-17 §4.5.2.4

North-South Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.224	sec	Fundamental Period	$=C_t*h_n^{\beta}$

East-West Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.224	sec	Fundamental Period	$=C_t*h_n^{\beta}$

Pseudo-Seismic Force

ASCE 41-17 §4.5.2.1

North-South Direction:

S_a =	0.98	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.27	*W	Pseudo-Seismic Force in Terms of Weight	*=C*Sa*W*
V =	**150.3**	k	Pseudo-Seismic Force	

East-West Direction:

S_a =	0.98	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.27	*W	Pseudo-Seismic Force in Terms of Weight	*=C*Sa*W*
V =	**150.3**	k	Pseudo-Seismic Force	

EXHIBIT C

Geotechnical Investigation

by Romig Engineers

Attachment 2

GEOTECHNICAL INVESTIGATION

WHITE BARN STRUCTURAL STABILIZATION

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

LA HONDA CREEK PRESERVE

SAN MATEO COUNTY, CALIFORNIA

Prepared for

ZFA Structural Engineers

1390 El Camino Real, Suite 100

San Carlos, California 94070

October 2019

Project No. 4907-2

ROMIG ENGINEERS

October 4, 2019
4907-2

ZFA Structural Engineers
1390 El Camino Real, Suite 100
San Carlos, California 94070

RE: GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION
WHITE BARN
MIDPENINSULA REGIONAL OPEN SPACE
DISTRICT LA HONDA CREEK PRESERVE
SAN MATEO COUNTY, CALIFORNIA

Attention: Mr. Steve Patton, P.E.

Gentlemen:

In accordance with your request, we have performed a geotechnical investigation for the structural stabilization of the White Barn located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The accompanying report summarizes the results of our field exploration, laboratory testing, and engineering analysis, and presents geotechnical recommendations for the proposed improvements.

We refer you to the text of our report for specific recommendations.

Thank you for the opportunity to work with you on this project. If you have any questions or comments concerning the findings or recommendations from our investigation, please call.

Very truly yours,

ROMIG ENGINEERS, INC.

REGISTERED PROFESSIONAL ENGINEER
LUCAS J. OTTOBONI
No. 84234
CIVIL
STATE OF CALIFORNIA

Lucas J. Ottoboni, P.E.

REGISTERED PROFESSIONAL ENGINEER
GLENN A. ROMIG
002157
GEOTECHNICAL
STATE OF CALIFORNIA

Glenn A. Romig, P.E., G.E.

Copies: Addressee (1 + via email)
Midpeninsula Regional Open Space District (via email)
Attn: Ms. Tanisha Werner

GAR:LO:wfz:pf

GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION – WHITE BARN
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
SAN MATEO COUNTY, CALIFORNIA

PREPARED FOR:

ZFA STRUCTURAL ENGINEERS

1390 EL CAMINO REAL, SUITE 100

SAN CARLOS, CALIFORNIA 94070

PREPARED BY:

ROMIG ENGINEERS, INC.

1390 EL CAMINO REAL, SECOND FLOOR

SAN CARLOS, CALIFORNIA 94070

OCTOBER 2019

ROMIG ENGINEERS

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

GEOTECHNICAL INVESTIGATION
FOR
STRUCTURAL STABILIZATION – WHITE BARN
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
SAN MATEO COUNTY, CALIFORNIA

INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed structural stabilization of the White Barn located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. The location of the site is shown on the Vicinity Map, Figure 1. The purpose of this investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for the proposed improvements.

Project Description

The project consists of improving or abandoning the White Barn structure in the Midpeninsula Regional Open Space District La Honda Creek Preserve. Since the options to abandon the structure will not require engineering solutions, those options have not been addressed in our report. If improved, the existing structure will either be stabilized to allow for exterior viewing only or the existing structure will be retrofitted to become storage space for district use.

Scope of Work

The scope of our work for this investigation was presented in our agreement with ZFA Structural Engineers, dated June 25, 2019. In order to accomplish our investigation, we performed the following work.

- Review of geologic, geotechnical, and seismic conditions in the vicinity of the site.

- Subsurface exploration consisting of drilling and logging two exploratory borings near the barn.

- Laboratory testing of selected samples to aid in soil classification and to help evaluate the engineering properties of the soil and bedrock encountered at the site.

- Engineering analysis and evaluation of surface and subsurface data to develop earthwork guidelines and foundation design criteria for the project.

- Preparation of this report presenting our findings, conclusions, and geotechnical recommendations for the proposed improvements.

Limitations

This report has been prepared for the exclusive use of ZFA Structural Engineers for specific application to developing geotechnical design criteria for the proposed structural stabilization of the White Barn located in the Midpeninsula Regional Open Space District La Honda Creek Preserve in an unincorporated area of San Mateo County near Woodside, California. We make no warranty, expressed or implied, for the services performed for this project. Our services have been performed in accordance with the geotechnical engineering principles generally accepted at this time and location. This report was prepared to provide engineering opinions and recommendations only. In the event there are any changes in the nature, design, or location of the project, or if any future improvements are planned, the conclusions and recommendations presented in this report should not be considered valid unless: 1) the project changes are reviewed by us, and; 2) the conclusions and recommendations presented in this report are modified or verified in writing.

The analysis, conclusions, and recommendations presented in this report are based on site conditions as they existed at the time of our investigation; the currently planned improvements; review of readily available reports relevant to the site conditions; and laboratory test results. In addition, it should be recognized that certain limitations are inherent in the evaluation of subsurface conditions, and that certain conditions may not be detected during an investigation of this type. Changes in the information or data gained from any of these sources could result in changes in our conclusions or recommendations. If such changes occur, we should be advised so that we can review our report in light of those changes.

SITE EXPLORATION AND RECONNAISSANCE

Site reconnaissance and subsurface exploration were performed on September 5, 2019. Subsurface exploration was performed using portable Minuteman drilling and sampling equipment. Two exploratory borings were advanced to sampler refusal conditions at depths of approximately 7.4 and 11.5 feet. The locations of the borings are shown on the Site Plan, Figure 2. The boring logs and the results of our laboratory tests performed on samples collected during our investigation are attached in Appendices A and B, respectively.

Surface Conditions

The site is located within the La Honda Creek Open Space Preserve along the south side of Kebet Ridge Road/Allen Road. At the time of our investigation, the site was occupied by a wood barn which had vertical wood exterior siding. The area immediately surrounding the barn was vegetated with native grasses.

The barn was situated near the top of a ridge(s) that extended to the northwest and southeast in an area that sloped gently to the southwest towards the top/start of a natural drainage. The natural drainage was vegetated with shrubs and small trees and was located about 20 feet from the south side of the barn. The drainage extended and served the hillside areas to the west of the barn. At the time of our preliminary site walk on February 7, 2019 (pre-proposal job walk which was performed prior to the start of our work under contract with the District), we noted that the ground within and around the drainage and area south of the barn was saturated. The slopes appeared to be moderately to steeply sloping further west of the barn.

The barn appeared to be supported on wood foundations at the perimeter and interior which were in direct contact with the earth. The existing barn was generally in fair to poor condition (given its age and use as a barn) with some of the wood siding and wood flooring observed to be deteriorating. The barn was generally tilting in the downslope/south direction.

Subsurface Conditions

At the location of our Exploratory Boring EB-1, we encountered about 4 feet of very stiff sandy silt of low plasticity underlain by about 2 feet of residual soil which consisted of hard sandy lean clay of low plasticity. Beneath the residual soil, we encountered sandstone bedrock of the Butano Formation to sampler refusal conditions at a depth of about 11.5 feet.

At Boring EB-2, we encountered very severely weathered sandstone to siltstone bedrock of the Butano Formation beginning at the ground surface and extending to sampler refusal conditions at a depth of about 8.4 feet.

We note that the upper 4 feet of Boring EB-1, located near the natural drainage way, was comprised of silts with pinhole voids. Through visual observation and previous experience with similar materials, we note that there may be a potential for these soils to be collapsible if water is introduced, which is likely to occur near the swale (as was observed during our job walk during the wet season). This phenomenon and the potential impacts are discussed later in this report.

A Liquid Limit of 28 and a Plasticity Index of 7 were measured on a sample of near-surface soil obtained from Boring EB-1. These test results indicate the surface and near-surface soils we encountered at the site have low plasticity and a low potential for expansion.

A free-swell test performed on a sample of bedrock obtained in Boring EB-2 indicated a free swell value of 30 percent. This free-swell test result along with our experience suggests the bedrock tested has a low potential for expansion.

<u>Ground Water</u>

Free ground water was not encountered in the borings during our investigation. The borings were backfilled with grout immediately after drilling and sampling was completed; therefore, a stabilized ground water level was not obtained. Please be cautioned that fluctuations in the level of ground water can occur due to variations in rainfall, landscaping, underground drainage patterns, and other factors. It is also possible and perhaps even likely that perched ground water conditions could develop in the soils and near the surface of the bedrock during and after significant rainfall or due to landscape watering at the property and the upslope areas.

GEOLOGIC SETTING

We have briefly reviewed our local experience and the geologic literature pertinent to the general site area. The information reviewed indicates that the site is located in an area mapped as middle and lower Eocene aged Butano Sandstone, Tb (Brabb, Graymer and Jones, 2000). This unit is expected to consist of light gray to buff, very fine to very coarse grained arkosic sandstone in thin to very thick beds interbedded with dark gray to brown mudstone and shale. The geology of the site vicinity is shown on the Vicinity Geologic Map, Figure 3.

The preliminary State Seismic Hazard Zones Map of the Woodside Quadrangle (2018) prepared by the California Geological Survey indicates that the site is located in an area that is potentially susceptible to "Earthquake-Induced Landslides." However, it appears that the mapping is associated with the steep slopes in the general site vicinity rather than the slopes in the immediate vicinity of the barn. In addition, we did not observe any obvious indications of slope instability immediately surrounding the white barn structure.

The lot and immediate site vicinity are located in a moderately sloping hillside area at an elevation of approximately 2,160 feet above sea level, Figure 1.

Faulting and Seismicity

There are no mapped through-going faults within or adjacent to the site and the site is not located within a State of California Earthquake Fault Zone (formerly known as a Special Studies Zone), an area where the potential for fault rupture is considered probable. The closest active fault is the San Andreas fault, which is located approximately 2.5 miles northeast of the property. Thus, the likelihood of surface rupture occurring from active faulting at the site is low.

The San Francisco Bay Area is an active seismic region. Earthquakes in the region result from strain energy constantly accumulating because of the northwestward movement of the Pacific Plate relative to the North American Plate. On average about 1.6-inches of movement occur per year. Historically, the Bay Area has experienced large, destructive earthquakes in 1838, 1868, 1906, and 1989. The faults considered most likely to produce large earthquakes in the area include the San Andreas, San Gregorio, Hayward, and Calaveras faults. The San Gregorio fault is located approximately 8.0 miles southwest of the site. The Hayward and Calaveras faults are located approximately 21 and 26 miles northeast of the site, respectively. These faults and significant earthquakes that have been documented in the Bay Area are listed in Table 1, and are shown on the Regional Fault and Seismicity Map, Figure 4.

Table 1. Earthquake Magnitudes and Historical Earthquakes
White Barn Structural Stabilization
San Mateo County, California

Fault	Maximum Magnitude (Mw)	Historical Earthquakes	Estimated Magnitude
San Andreas	7.9	1989 Loma Prieta	6.9
		1906 San Francisco	7.9
		1865 N. of 1989 Loma Prieta Earthquake	6.5
		1838 San Francisco-Peninsula Segment	6.8
		1836 East of Monterey	6.5
Hayward	7.1	1868 Hayward	6.8
		1858 Hayward	6.8
Calaveras	6.8	1984 Morgan Hill	6.2
		1911 Morgan Hill	6.2
		1897 Gilroy	6.3
San Gregorio	7.3	1926 Monterey Bay	6.1

In the future, the subject property will undoubtedly experience severe ground shaking during moderate and large magnitude earthquakes produced along the San Andreas fault or other active Bay Area fault zones. Using information from recent earthquakes, improved mapping of active faults, ground motion prediction modeling, and a new model for estimating earthquake probabilities, a panel of experts convened by the U.S.G.S. have concluded there is a 72 percent chance for at least one earthquake of Magnitude 6.7 or larger in the Bay Area before 2043. The Hayward fault has the highest likelihood of an earthquake greater than or equal to magnitude 6.7 in the Bay Area, estimated at 33 percent, while the likelihood on the San Andreas and Calaveras faults is estimated at approximately 22 and 26 percent, respectively (Aagaard et al., 2016).

Earthquake Design Parameters

The State of California currently requires that buildings and structures be designed in accordance with the seismic design provisions presented in the 2016 California Building Code and in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures." Based on site geologic conditions and on information from our subsurface exploration at the site, the site may be classified as Site Class C, very dense soil and soft rock, in accordance with Chapter 20 of ASCE 7-10. Spectral Response Acceleration parameters and site coefficients may be taken directly from the U.S.G.S. website based on the longitude and latitude of the site. For site latitude (37.3777), longitude (-122.2798) and Site Class C, design parameters are presented on Table 2 on the following page.

Table 2. 2016 CBC Seismic Design Criteria
White Barn Structural Stabilization
San Mateo County, California

Spectral Response Acceleration Parameters		Design Value
Mapped Value for Short Period -	S_S	2.050
Mapped Value for 1-sec Period -	S_1	0.968
Site Coefficient -	F_a	1.0
Site Coefficient -	F_v	1.3
Adjusted for Site Class -	S_{MS}	2.050
Adjusted for Site Class -	S_{M1}	1.258
Value for Design Earthquake -	S_{DS}	1.367
Value for Design Earthquake -	S_{D1}	0.839

CONCLUSIONS

From a geotechnical viewpoint, the site is suitable for the proposed structural stabilization of the white barn, provided the recommendations presented in this report are followed during design and construction. Specific geotechnical recommendations are provided in the following sections of this report.

The primary geotechnical concerns for the proposed project are the localized drainage swale located south of the barn, the presence of up to about 4 feet of potentially collapsible silt at the location of Boring EB-1 (near/within the drainage way), and the potential for severe ground shaking at the site due to moderate to large earthquakes in the area.

In our opinion, the civil design should consider the flow path of the localized drainage way in relation to the existing structure, i.e. capturing surface and/or subsurface water at the upslope areas and re-routing to a suitable location along the downslope areas. Also, depending upon where the structures are situated and/or the conditions exposed during grading and foundation trenching, a subdrain or foundation drain along the upslope side may be beneficial.

In addition, we note that thickness of the silty soils and/or the depth to bedrock appears to increase from the upslope side (bedrock at the surface) to the south side (4 to 6 feet from the surface). In order to reduce the potential impact on the proposed structures from differential settlement, we recommend that foundations extend beneath the silty soils and extend into competent residual soil or weathered bedrock. Since this could result in foundation excavations of about 4 feet deep in certain areas (or deeper depending on the location of the structures in relation to the swale), alternatively, deepened footing excavations could be backfilled with compacted fill or lean concrete cement slurry. Specific geotechnical recommendations are provided in the following sections of this report.

Because subsurface conditions may vary from those encountered at the locations of our borings, and to observe that our recommendations are properly implemented, we recommend that we be retained to 1) review the project plans for conformance with our recommendations; and 2) observe and test during earthwork and foundation construction.

FOUNDATIONS

Spread Footing Foundations

In our opinion, the barn may be supported on conventional continuous and isolated spread footing foundations bearing in competent residual soil or weathered bedrock. The footings should have a width of at least 15 inches and should extend at least 24 inches below lowest adjacent grade, 15 inches below the crawl space grade, and at least 18 inches below the bottom of slab elevation, whichever is deeper. Lowest adjacent grade should be considered to be the lowest grade within 5 feet from the edge of the foundation.

In addition, the footing excavations should extend below the silty soils and at least 6 inches into residual soil and/or bedrock, even if this requires a deeper embedment depth. As mentioned in the above sections, up to about 4 feet of firm near-surface soils were encountered during our subsurface exploration in Boring EB-1. If this requires footings to be excavated to a depth of about 4 to 5 feet, lean concrete or compacted fill may be placed at the deepened portion of the footing excavations. If compacted fill is used, we recommend that aggregate base rock or other granular soil be used and be compacted and tested per the earthwork guidelines of this report.

Footings with at least these minimum dimensions may be designed for an allowable bearing pressure of 3,000 pounds per square foot for dead plus live loads with a one-third increase allowed when considering additional short-term wind or seismic loading.

All footings located adjacent to utility lines should be embedded below a 1:1 plane extending up from the bottom edge of the utility trench. All continuous footings should be reinforced with top and bottom steel, to provide structural continuity and to permit spanning of local irregularities.

The bottom of all footing excavations should be cleaned of loose, soft, overly moist or collapsible soil and debris. A member of our staff should observe the excavations to confirm that they have at least the minimum recommended dimensions, are founded in competent residual soil or bedrock, and have been properly cleaned prior to placing concrete forms and reinforcing steel. If existing fill soil, colluvial soil, or disturbed bedrock is encountered at the foundation bearing depth, our field representative will require these materials to be removed and a deeper embedment depth before reinforcing steel is placed.

Lateral Loads

Lateral loads will be resisted by friction between the bottom of the spread footings/piers and the supporting subgrade. A coefficient of friction of 0.30 may be assumed for design. Lateral resistance may also be provided by passive soil pressure acting against foundations cast neat in footing excavations or backfilled with properly compacted structural fill. We recommend a passive pressure based on an equivalent fluid pressure of 350 pounds per cubic foot be used in design. The upper foot of passive soil resistance should be neglected where soil adjacent to the footing is not covered with a slab or pavement.

Settlement

Thirty-year differential settlement due to static loads is not expected to exceed 1-inch across the areas supported on new foundations, provided foundations are designed and constructed as recommended.

SLABS-ON-GRADE

General Slab Considerations

To reduce the potential for movement of the slab subgrade, at least the upper 6 inches of subgrade soil should be scarified and compacted at a moisture content near the laboratory optimum. The native soil subgrade should be kept moist up until the time the non-expansive fill, crushed rock and vapor barrier, and/or aggregate base is placed. Slab subgrades and non-expansive fill should be prepared and compacted as recommended in the section of this report titled "Earthwork."

Overly soft or moist soils should be removed from slab-on-grade areas. Exterior flatwork and interior slabs-on-grade should be underlain by a layer of non-expansive fill as discussed below. The non-expansive fill should consist of aggregate base rock or a clayey soil with a plasticity index of 15 or less.

Considering the potential for some differential movement of the surface and near-surface soils, we expect that reinforced slabs will perform better than unreinforced slabs. Consideration should be given to using a control joint spacing on the order of 2 feet in each direction for each inch of slab thickness.

Exterior Flatwork

Concrete walkways and exterior flatwork should be at least 4 inches thick and should be constructed on at least 6 inches of Class 2 aggregate base. To improved performance, exterior slabs-on-grade, such as for patios, may be constructed with a thickened edge to improve edge stiffness and to reduce the potential for water seepage under the edge of the slabs and into the underlying base and subgrade. In our opinion, the thickened edges should be at least 8 inches wide and ideally should extend at least 4 inches below the bottom of the underlying aggregate base layer.

EARTHWORK

Clearing and Subgrade Preparation

All deleterious materials, such as designated existing foundations and retaining walls, slabs and utilities to be abandoned, surface fills, concrete, vegetation, roots, topsoil, etc., should be cleared from areas to be built on or paved. The actual stripping depth should be determined by a member of our staff at the time of construction. Excavations that extend below finish grade should be backfilled with structural fill that is water-conditioned, placed, and compacted as recommended in the section titled "Compaction."

After the site has been properly cleared, stripped, and excavated to the required grades, exposed soil surfaces in areas to receive structural fill or slabs-on-grade should be scarified to a depth of 6 inches, moisture conditioned, and compacted as recommended for structural fill in the section titled "Compaction."

Large fills are generally not desirable on a hillside site like this. However, if fills are to be constructed on natural slopes having an inclination steeper than 6 horizontal to 1 vertical, the fill should be benched, and a key excavated into the underlying bedrock, and subdrains installed if required by our field representative. If significant fills are required, we can evaluate their feasibility and provide benching criteria as necessary.

Material for Fill

All on-site soil containing less than 3 percent organic material by weight (ASTM D2974) is suitable for use as structural fill. However, structural fill placed at the site, should not contain rocks or pieces larger than 6 inches in greatest dimension, and contain no more than 15 percent larger than 2.5 inches. Imported fill should have a plasticity index of less than 15 percent or be predominately granular. Our representative should approve import materials prior to their use on-site.

Compaction

Scarified soil surfaces and all structural fill should be compacted in uniform lifts no thicker than 8 inches in pre-compacted thickness, and should be water conditioned and compacted as recommended for structural fill on Table 3. The relative compaction and moisture content recommended in Table 3 is based on ASTM Test D1557, latest edition.

Table 3. Compaction Recommendations
White Barn Structural Stabilization
San Mateo County, California

	Relative Compaction*	Moisture Content*
General		
• Scarified subgrade in areas to receive structural fill.	90 percent	Above optimum
• Structural fill composed of fill or native soils.	90 percent	Above optimum
• Structural fill composed of non-expansive fill.	90 percent	Near optimum
• Structural fill below a depth of 4 feet.	93 percent	Near optimum
Pavement Areas		
• Upper 6-inches of soil below aggregate base.	95 percent	Above optimum
• Aggregate base.	95 percent	Near optimum
Utility Trench Backfill		
• On-site soil.	90 percent	Above optimum
• Imported sand	95 percent	Near optimum

* Relative to ASTM Test D1557, latest edition.

Temporary Slopes and Excavations

The contractor should be responsible for the design and construction of all temporary slopes and any required shoring. Shoring and bracing should be provided in accordance with all applicable local, state and federal safety regulations, including the current OSHA excavation and trench safety standards.

Because of the potential for variation of the on-site soils, field modification of temporary cut slopes may be required. Unstable materials encountered on slopes during and after excavation should be trimmed off even if this requires cutting the slopes back to a flatter inclination.

Protection of structures near cuts should also be the responsibility of the contractor. In our experience, a preconstruction survey is generally performed to document existing conditions prior to construction, with intermittent monitoring of the structures during construction.

Subdrain System

To reduce the potential for water intrusion beneath the barn, subdrains could be installed around the upslope sides of the structure. If installed, the subdrains should extend to at least 3 to 4 feet deep from current site grades and should be located at least 2 feet from the edge of the barn. The subdrains should consist of a 12-inch width of free-draining crushed rock wrapped in an approved filter fabric or Class 2 Permeable Material. Four-inch diameter rigid plastic pipe (schedule 40 PVC, SDR 3 or equal) should be placed with perforations down on a 4-inch thick bed of crushed rock. The subdrain rock should be continued up to within about 12 to 18 inches of finished grade. Water collected in the subdrain system should be discharged to a suitable discharge location (such as the natural swale south of the barn). In addition, cleanouts should be provided as needed.

Surface Drainage

Finished grades should be designed to prevent ponding of water and to direct surface water runoff away from foundations, and edges of slabs and pavements, and toward suitable collection and discharge facilities. Slopes of at least 2 percent are recommended for flatwork and pavement areas with 5 percent preferred in landscape areas within 8 feet of the structures, where possible. At a minimum, splash blocks should be provided at the discharge ends of roof downspouts to carry water away from perimeter foundations. Preferably, roof downspout water should be collected in a closed pipe system that is routed to a storm drain system or other suitable location.

Drainage facilities should be observed to verify that they are adequate and that no adjustments need to be made, especially during the first two years following construction. We recommend preparing an as-built plan showing the locations of surface and subsurface drain lines and clean-outs. The drainage facilities should be periodically checked to verify that they are continuing to function properly. It is likely the drainage facilities will need to be periodically cleaned of silt and debris that may build up in the lines.

Finished Slopes

We recommend that finished slopes be cut or filled to an inclination no steeper than 2:1 (horizontal:vertical). Exposed slopes may be subject to minor sloughing and erosion that may require periodic maintenance. We recommend that all slopes and soil surfaces disturbed during construction be planted with erosion-resistant vegetation.

FUTURE SERVICES

Plan Review

Romig Engineers should review the completed grading and foundation plans for conformance with the recommendations presented in this report. We should be provided with these plans as soon as possible upon their completion in order to limit the potential for delays in the permitting process that might otherwise be attributed to our review process. The County will require a "clean" geotechnical plan review letter prior to their review and acceptance of the plans. Since our plan reviews often result in recommendations for modification of the plans, our generation of a "clean" review letter often requires two iterations.

At a minimum, we recommend the following note be added to the plans: "Earthwork, slab subgrade and non-expansive fill preparation, foundation and slab construction, utility trench backfilling, subdrain construction (if selected), site drainage and grading should be performed in accordance with the geotechnical report prepared by Romig Engineers, Inc., dated October 4, 2019. Romig Engineers should be notified at least 48 hours in advance of any earthwork or foundation construction and should observe and test during earthwork and foundation construction as recommended in the geotechnical report."

Construction Observation and Testing

All earthwork and foundation construction should be observed and tested by us to 1) establish that subsurface conditions are compatible with those used in the analysis and design; 2) observe compliance with the design concepts, specifications and recommendations; and 3) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations in this report are based on a limited number of borings. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it will be necessary to reevaluate our recommendations.

❖ ❖ ❖ ❖ ❖

REFERENCES

Aagaard, B.T., Blair, J.L., Boatwright, J., Garcia, S.H., Harris, R.A., Michael, A.J., Schwartz, D.P., and DiLeo, J.S., 2016, Earthquake outlook for the San Francisco Bay region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020, 6 p., http://dx.doi.org/10.3133/fs20163020.

American Society of Civil Engineers, 2010, Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-10.

Brabb, E.E., Graymer, R.W., and Jones, D.L., 2000, Geology of the Palo Alto 30 x 30 Minute Quadrangle, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2332.

California Building Standards Commission, and International Code Council, 2016 California Building Code, California Code of Regulations, Title 24, Part 2.

California Department of Conservation, Division of Mines and Geology (DMG), 1994, Fault-Rupture Hazard Zones in California, Special Publication 42.

California Geological Survey, 2019, Seismic Hazard Zone Report for the Woodside 7.5-Minute Quadrangle, Santa Clara, Alameda, and San Mateo Counties, California, Seismic Hazard Zone Report 129.

U.S.G.S., 2018, U.S. Seismic Design Maps, Earthquake Hazards Program, http://earthquake.usgs.gov/designmaps/us/application.php.

❖ ❖ ❖ ❖ ❖

Attachment 2

Scale: 1 inch = 2000 feet
Base is United States Geological Survey Palo Alto 7.5 Minute Quadrangle, dated 1997.

VICINITY MAP | **FIGURE 1**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN | OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA | PROJECT NO. 4907-2

ROMIG ENGINEERS

LEGEND

EB-2 Approximate Locations of Exploratory Borings.
Approximate Scale: 1 inch = 60 feet.
Base is aerial photograph, retrieved from Google Earth.

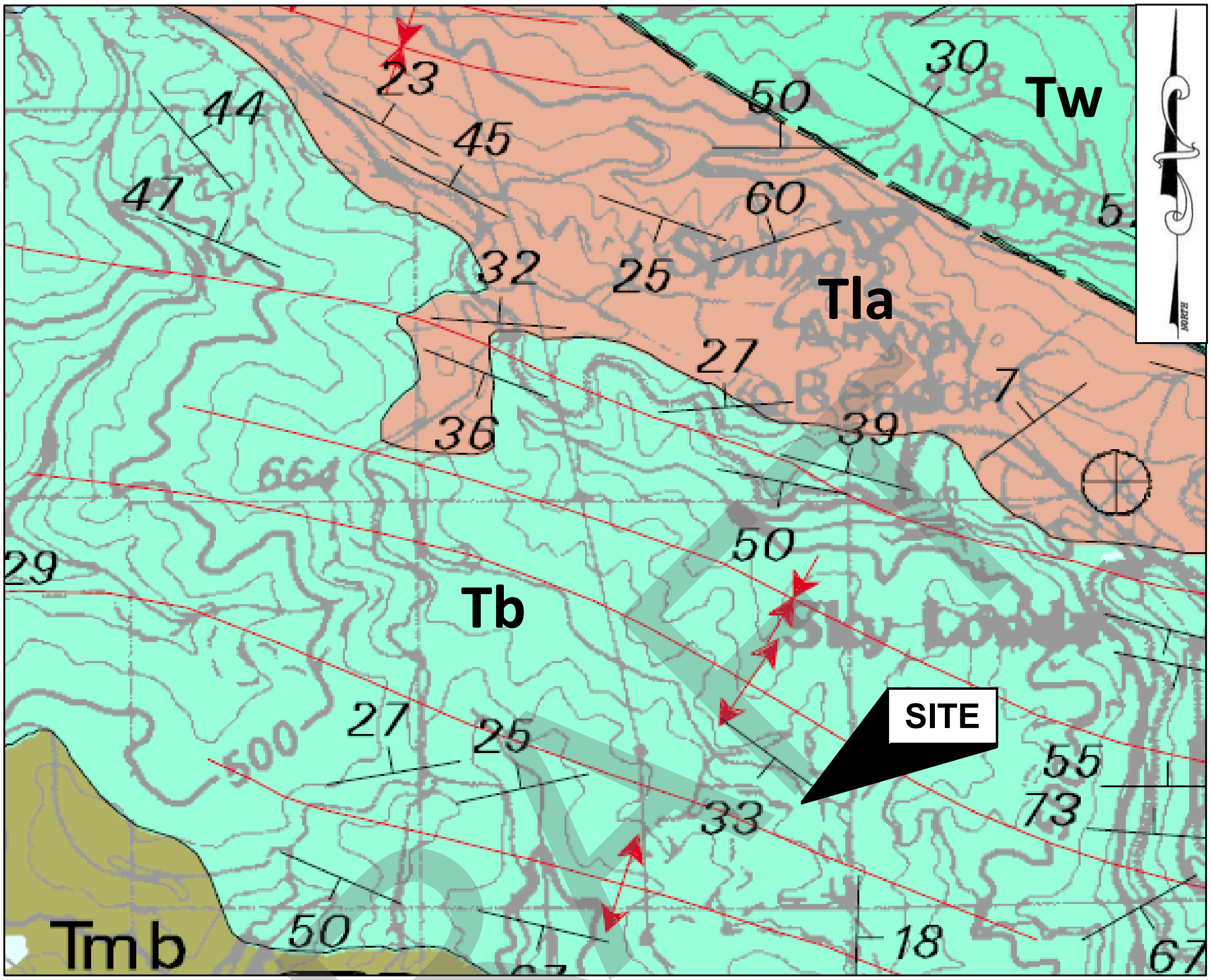
0 30 60 120 feet

SITE PLAN
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 2
OCTOBER 2019
PROJECT NO. 4907-2

ROMIG ENGINEERS

Attachment 2



MAP LEGEND

Tb	Butano Formation
Tla	Lambert Shale
Tmb	Mindego Basalt
Tw	Whiskey Hill Formation

Geologic Contact - dashed where approximate, dotted where inferred.

35

Strike and dip of bedding

0 1000 2000 4000 feet

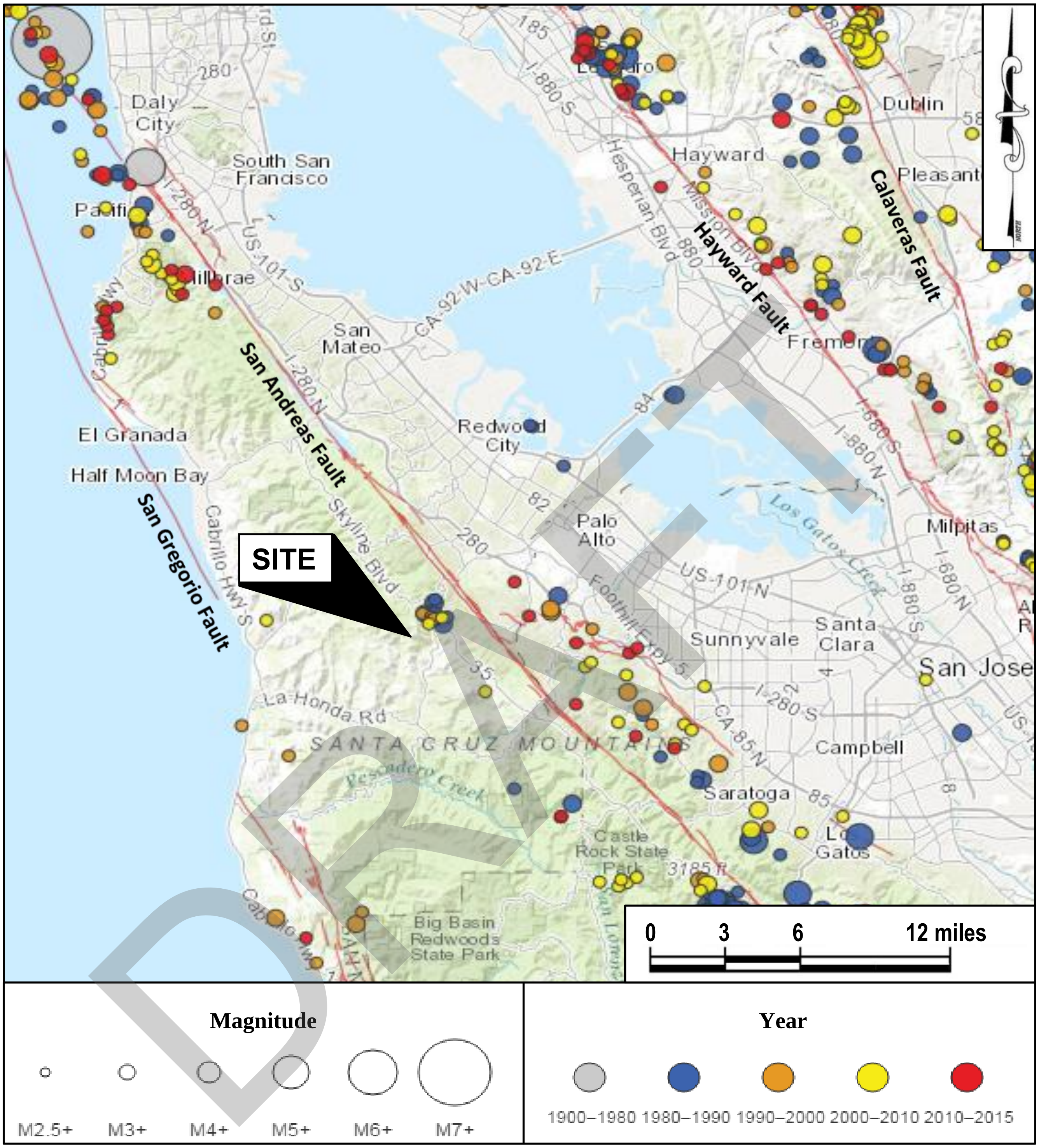
Scale: 1 inch = 2000 feet

Base is Geologic Map of Palo Alto 30 x 60 Minute Quadrangle (Brabb, Graymer, and Jones, 2000).

VICINITY GEOLOGIC MAP
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 3
OCTOBER 2019
PROJECT NO. 4907-2

ROMIG ENGINEERS



Earthquakes with M5+ from 1900 to 1980, M2.5+ from 1980 to January 2015. Faults with activity in last 15,000 years. Based on data sources from Northern California Earthquake Data Center and USGS Quaternary Fault and Fold Database, accessed May 2015.

REGIONAL FAULT AND SEISMICITY MAP
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN
SAN MATEO COUNTY, CALIFORNIA

FIGURE 4
OCTOBER 2019
PROJECT NO. 4907-2

ROMIG ENGINEERS

APPENDIX A

FIELD INVESTIGATION

The soils and bedrock encountered during drilling were logged by our representative and samples were obtained at depths appropriate to the investigation. The samples were taken to our laboratory where they were examined and classified in accordance with the Unified Soil Classification System. The logs of our borings, as well as a summary of the soil classification system (Figure A-1) and bedrock descriptions (Figure A-2) used on the logs, are attached.

Several tests were performed in the field during drilling. The standard penetration test resistance was determined by dropping a 140-pound hammer through a 30-inch free fall and recording the blows required to drive the 2-inch (outside diameter) sampler 18 inches. The standard penetration test (SPT) resistance is the number of blows required to drive the sampler the last 12 inches and is recorded on the boring logs at the appropriate depths. Soil samples were also collected using 2.5-inch and 3.0-inch O.D. drive samplers. The blow counts shown on the logs for these larger diameter samplers do not represent SPT values and have not been corrected in any way.

The locations of the borings were established by pacing using the satellite imagery retrieved from Google Earth on September 30, 2019. The locations of the borings should be considered accurate only to the degree implied by the method used.

The boring logs and related information depict our interpretation of subsurface conditions only at the specific location and time indicated. Subsurface conditions and ground water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes in the subsurface conditions.

❖ ❖ ❖ ❖ ❖

USCS SOIL CLASSIFICATION

PRIMARY DIVISIONS			SOIL TYPE	SECONDARY DIVISIONS
COARSE GRAINED SOILS (< 50 % Fines)	GRAVEL	CLEAN GRAVEL (< 5% Fines)	GW	Well graded gravel, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVEL with FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SAND	CLEAN SAND (< 5% Fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SAND WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS (> 50 % Fines)	SILT AND CLAY Liquid limit < 50%		ML	Inorganic silts and very fine sands, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, lean clays.
			OL	Organic silts and organic clays of low plasticity.
	SILT AND CLAY Liquid limit > 50%		MH	Inorganic silt, micaceous or diatomaceous fine sandy or silty soil.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.
BEDROCK			BR	Weathered bedrock.

RELATIVE DENSITY

SAND & GRAVEL	BLOWS/FOOT*
VERY LOOSE	0 to 4
LOOSE	4 to 10
MEDIUM DENSE	10 to 30
DENSE	30 to 50
VERY DENSE	OVER 50

CONSISTENCY

SILT & CLAY	STRENGTH^	BLOWS/FOOT*
VERY SOFT	0 to 0.25	0 to 2
SOFT	0.25 to 0.5	2 to 4
FIRM	0.5 to 1	4 to 8
STIFF	1 to 2	8 to 16
VERY STIFF	2 to 4	16 to 32
HARD	OVER 4	OVER 32

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12 " 3" 0.75" 4 10 40 200

SIEVE OPENINGS U.S. STANDARD SERIES SIEVE

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

* Standard Penetration Test (SPT) resistance, using a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler; blow counts not corrected for larger diameter samplers.

^ Unconfined Compressive strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.

KEY TO SAMPLERS

Modified California Sampler (3-inch O.D.)
Mid-size Sampler (2.5-inch O.D.)
Standard Penetration Test Sampler (2-inch O.D.)

KEY TO EXPLORATORY BORING LOGS **FIGURE A-1**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

ROMIG ENGINEERS

WEATHERING

Fresh
Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very Slight
Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight
Rock generally fresh, joints stained, and discoloration extends into rock up to 1 inch. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate
Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some are clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately Severe
All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe
All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very Severe
All rock except quartz discolored and stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.

Complete
Rock reduced to "soil". Rock fabric not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

HARDNESS

Very hard
Cannot be scratched with knife or sharp pick. Hand specimens requires several hard blows of geologist's.

Hard
Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately Hard
Can be scratched with knife or pick. Gouges or grooves to 1/4 inch deep can be excavated by hard blow of point of a geologist's pick. Hard specimen can be detached by moderate blow.

Medium
Can be grooved or gouged 1/16 inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 inch maximum size by hard blows of the point of a geologist's pick.

Soft
Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be brocken by finger pressure.

Very Soft
Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

JOINT BEDDING AND FOLIATION SPACING

Spacing	Joints	Bedding and Foliation
Less than 2 in.	Very Close	Very Thin
2 in. to 1 ft.	Close	Thin
1 ft. to 3 ft.	Moderately Close	Medium
3 ft. to 10 ft.	Wide	Thick
More than 10 ft.	Very Wide	Very Thick

ROCK QUALITY DESIGNATOR (RQD)

RQD, as a percentage	Descriptor
Exceeding 90	Excellent
90 to 75	Good
75 to 50	Fair
50 to 25	Poor
Less than 25	Very Poor

KEY TO BEDROCK DESCRIPTIONS
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN
SAN MATEO COUNTY, CALIFORNIA

FIGURE A-2
OCTOBER 2019
PROJECT NO. 4907-2

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** RL

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** NA **DATE DRILLED:** 09/05/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Dark brown, Sandy Silt, moist, fine to coarse grained sand, low plasticity, some roots, pinholes observed.	Very Stiff	ML		0		19	12		
■ Liquid Limit = 28, Plasticity Index = 7.						19	14		
Residual Soil: Brown, Sandy Lean Clay, moist, fine to coarse grained sand, low to moderate plasticity.	Hard	CL		5		38	22		
Butano Formation: Brown, Sandstone, moist, fine grained sand, friable, severely weathered.	Soft to Hard	BR				47	20		
				10		32	16		
						50/6"	15		
Bottom of Boring at 11.5 Feet.				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger

LOGGED BY: RL

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** NA **DATE DRILLED:** 09/05/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Butano Formation: Brown, Sandstone to Siltstone, moist, fine grained, fractured, friable, severely weathered.	Medium	BR		0					
						16	12		
▲ Free Swell = 13%.					▲	81	20		
						50/5"			
				5		50/6"	15		
						55	18		
						50/5"	17		
Bottom of Boring at 7.4 feet.									
				10					
				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-2
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN
SAN MATEO COUNTY, CALIFORNIA

BORING EB-2
OCTOBER 2019
PROJECT NO. 4907-2

ROMIG ENGINEERS

APPENDIX B

LABORATORY TESTS

Samples collected during subsurface exploration were selected for tests to help evaluate the physical and engineering properties of the soils and bedrock that was encountered. The tests that were performed are briefly described below.

The natural moisture content was determined in accordance with ASTM D2216 on nearly all of the samples recovered from the borings. This test determines the moisture content, representative of field conditions, at the time the samples were collected. The results are presented on the boring logs at the appropriate sample depths.

The Atterberg Limits were determined on one sample of soil in accordance with ASTM D4318. The Atterberg Limits are the moisture content within which the soil is workable or plastic. The results of this test are presented in Figure B-1 and on the log of Boring EB-1 at the appropriate sample depth.

A free swell test was performed on one sample of the weathered bedrock recovered from Boring EB-2. The result is presented on the boring log at the appropriate sample depth.

❖ ❖ ❖ ❖ ❖

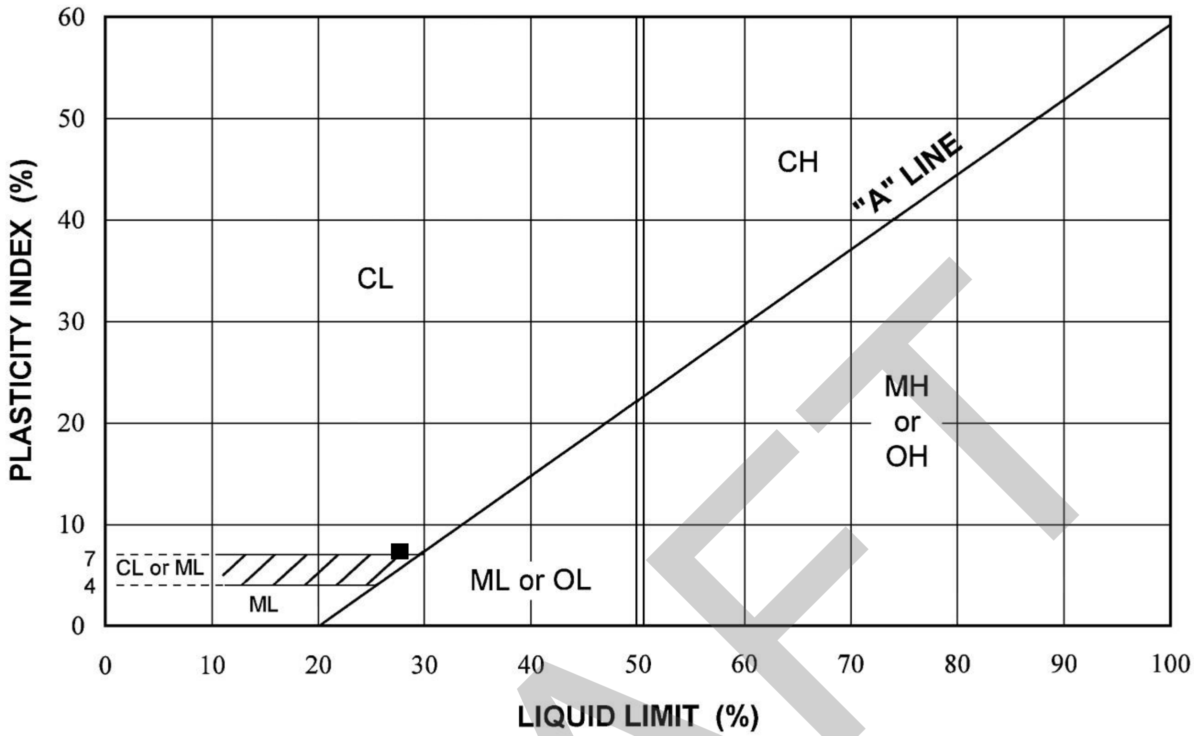


Chart Symbol	Boring Number	Sample Depth (feet)	Water Content (percent)	Liquid Limit (percent)	Plasticity Index (percent)	Liquidity Index (percent)	Passing No. 200 Sieve (percent)	USCS Soil Classification
■	EB-1	2-4	14	28	7	-100		ML

PLASTICITY CHART **FIGURE B-1**

MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

Attachment 2

ROMIG ENGINEERS, INC.

1390 El Camino Real, 2nd Floor

San Carlos, California 94070

Phone: (650) 591-5224

www.romigengineers.com

EXHIBIT D

Asbestos and Lead Survey

by Terracon Consultants, Inc.

Asbestos & Lead Survey

Three Buildings

Beatty House, La Honda White Barn, and La Honda Log Cabin

Midpeninsula Regional Open Space District

August 20, 2019

Revised November 14, 2019

Terracon Project No. R1197192

Prepared for:

ZFA Structural Engineers

San Carlos, CA 94070

Prepared by:

Terracon Consultants, Inc.

Emeryville, CA

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Terracon Consultants, Inc. (Terracon) conducted a pre-renovation asbestos and lead survey of three buildings, the Beatty House, La Honda White Barn, and La Honda Log Cabin near La Honda, California. We understand this asbestos survey was requested in support of the planned renovation of the building(s). The purpose of this survey was to sample and identify suspect materials and provide information regarding the identity, location, condition, and approximate quantities of asbestos containing materials (ACM), lead containing paint, mercury containing switches and light fixtures, PCB containing lighting ballasts and ozone depleting coolants. The survey was performed on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors in general accordance with the sampling protocols established in United State Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act, (AHERA). Terracon collected 89 bulk samples from homogeneous areas of suspect ACM.

Terracon collected seventy (70) samples from twenty-two (22) homogeneous area of suspected asbestos-containing materials (ACM). Laboratory analysis reported that seven (7) samples and two (2) materials contain asbestos.

Terracon collected two (2) paint chip samples from the La Honda Log cabin, one (1) from the La Honda White Barn, and six (6) from the Beatty House. Analysis of the paint samples reported that all of paint-chip samples had detectable concentrations of lead. One (1) sample from the La Honda White Barn and three (3) samples from the Beatty House had lead concentrations in excess of the California Department of Public Health definition of Lead-Based Paint.

HAZARDOUS MATERIALS SURVEY
ZFA - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin
Midpeninsula Regional Open Space District

Terracon Project No. R1197192
43697

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was contracted by ZFA Structural Engineers (ZFA) to conduct a hazardous materials survey of three buildings owned by the Midpeninsula Regional Open Space District, including the Beatty House near Los Gatos and the La Honda White Barn and La Honda Log Cabin near La Honda, California. The survey was conducted on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors. The survey included the interior and exterior building components. Homogeneous areas of suspect asbestos-containing materials (ACM), lead-containing paints, PCB containing lighting ballasts, mercury containing thermostats, and mercury containing lighting tubes were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled materials could be located in walls, in voids or in other concealed areas.

1.1 Scope of Work

The scope of the survey was as follows:

- Inspect the subject buildings for the presence of suspect ACMs, lead-containing paint, mercury-containing products, polychlorinated biphenyl lighting ballasts.
- Collect samples of suspect ACMs following a National Emissions Standards for Hazardous Air Pollutants (NESHAPS) protocol for sample collection for a demolition survey.
- Asbestos bulk samples will be analyzed using polarized light microscopy (PLM) in accordance with the EPA's July 1993 method for the determination of asbestos in bulk building materials - EPA 600/R-93/116.
- Collect bulk paint chip samples of primary painted surfaces and other materials suspected to be lead containing. Bulk samples will be analyzed at an accredited laboratory by Flame Atomic Absorption (AA) for Total Lead reported in parts per million (ppm).
- Submit written report including analytical results, regulatory requirements and conclusions.

The subject spaces included in the scope of were limited to:

- The interior and exterior of the Beatty House,
- The interior and exterior of the La Honda Log Cabin, and

- The interior and exterior of the La Honda White Barn.

2.0 ASBESTOS AND LEAD SURVEY

The survey was conducted by Mike Harrington and Mike Reed, asbestos inspectors. Mike Harrington is certified by the Division of Occupational Safety and Health (Cal/OSHA) as a Site Surveillance Technician (SST # 01-3017). Mike Reed is also certified by Cal/OSHA (SST # 08-4464). The survey was managed and supervised by Michael Benefield. Mr. Benefield is certified by Cal/OSHA as a Certified Asbestos Consultant (CAC # 06-3938). Terracon's project personnel's certifications can be found in Appendix E of this report. The survey was conducted in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to an accredited laboratory for analysis by Polarized Light Microscopy (PLM).

2.1 Visual Assessment of Suspect ACM

Survey activities were initiated with visual observation of the interior and exterior of the building to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application. Interior assessment was conducted in visually accessible areas of the building proposed for demolition.

Terracon typically investigated for flooring beneath carpeting by lifting small corner sections of carpet. If additional flooring was seen, they have been identified in the report. If flooring was not seen at corners under the carpet, it does not imply that there are no tiles beneath the carpeted floor. Terracon inspected the walls in multiple places throughout the building and did not observe additional coverings/layers except where noted in this report, but there may be areas of additional suspect material present within the building walls not investigated. Terracon did not inspect in concealed wall cavities or in sub grade areas.

2.2 Bulk Sampling Suspect ACM

Bulk samples were collected of homogeneous suspect materials that were within the area covered by the scope of work. A homogeneous material is defined as a surfacing material, thermal system insulation, or miscellaneous material that is uniform in color, texture and age of construction. Examples of homogeneous materials include:

- Pipe insulation produced by the same manufacturer and installed during the same time period;
- Resilient flooring of identical color and pattern;

- Troweled on surfacing materials located in contiguous areas.

The buildings were visually inspected for the presence of suspect materials. As materials were identified, bulk samples were obtained with the aid of a coring device or other hand tool and placed into individual sampling bags. Each sample was given a discreet identification number and recorded on field notes as well as chain of custody forms. Refer to accompanying tables and appendices for details on material sample locations and results.

2.3 Physical Assessment of Suspect ACM

A physical assessment of each homogeneous area (HA) of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

2.4 Sample Analysis of Suspect ACM

Bulk samples of suspect ACM were analyzed by EM Lab P&K of Phoenix, AZ. EML is accredited under the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program (NVLAP). Analysis was conducted by Polarized Light Microscopy (PLM) in accordance with EPA 600/R92-116 (1993) method. Asbestos content was determined by visual estimation. The lower quantitation limit of PLM is recognized to be 1%. To reliably determine that a material in which asbestos was detected by PLM, contains less than 1% asbestos the samples must be re-analyzed by PLM Point Count. In accordance with EPA assessment criteria, if a single sample of a homogeneous material tests positive for asbestos, all areas of that homogeneous material are considered to be asbestos-containing.

2.5 Bulk Sampling of Lead Paint and Suspect Bulk Materials

Paint chip and bulk samples were collected using a hand scraper or chisel and were placed into individual plastic sampling containers. Each sample was provided a discreet sample number, which was recorded on a chain of custody form. The samples were transported under chain of custody procedures to J3 Resources of Pasadena, TX. Please refer to Table III for details on sample locations and sample results. All paint and ceramic tile glazing samples were analyzed for lead content using the Flame Atomic Absorption spectroscopy in accordance to EPA Method SW846-7420.

3.0 FINDINGS AND RECOMMENDATIONS

3.1 Asbestos

The following asbestos-containing materials were identified as a result of laboratory analysis or assumed to be asbestos containing:

HM # / Material Description	General Material Location	NESHAP Category	Asbestos Type	Estimated Quantity
Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360
Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% chrysotile composite	3,700
NA = Not Applicable, CH = Chrysotile, lf = linear feet, sf = square feet, RACM = Regulated asbestos containing material (friable), Cat. I = Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), Cat. II = Category II Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), sf = square feet, lf = linear feet				

No asbestos was detected in any of the samples collected in the La Honda Log Cabin or in the La Honda White Barn. No identified materials were unable to be sampled and assumed to contain asbestos in any of the three buildings.

Vinyl sheet flooring in the Beatty House Living Room is friable ACM. Friable ACM is Regulated Asbestos-Containing Material (RACM) and must be removed prior to start of demolition or renovation activities. The wallboard system in the Beatty House has ACM joint compound. Composite analysis of the joint compound and the wallboard by PLM point count reported that the composite contained less than 1% asbestos. This material is not an ACM as defined by NESHAP and BAAQMD. However, Cal/OSHA does not allow composite analysis, so the joint compound is an ACM as defined by Cal/OSHA. All removal of ACM materials including materials non-friable materials left in the building must be conducted by a licensed and registered asbestos abatement contractor in accordance with 8CCR1529 and the BAAQMD Regulation 11 Rule 2. If additional suspect materials that have not been characterized in this report are discovered during demolition, these materials must be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.

A summary of the classification, condition and approximate quantity of identified ACM is presented in Appendix A. The summary of sample locations is presented in Appendix B. Laboratory analytical reports are included in Appendix C.

3.2 Lead-Containing Paints and Materials

Nine (9) painted surfaces were sampled and analyzed for potential lead content. Nine (9) of the painted surfaces were found to contain lead content above the laboratory detection limit. Four (4) painted surfaces were found to contain lead in concentrations exceeding 5,000 parts per million. The laboratory results for lead testing are summarized in Table III below.

TABLE III
LEAD SAMPLE RESULTS

Sample Number	Material Description and Location	Results mg/kg (ppm)	Lead-Containing	Lead-Based Paint
L-01	La Honda Log Cabin: Green paint on wood floor in the Log Cabin Kitchen	4,200	Y	N
L-02	La Honda Log Cabin: White paint on glass and wood on the Log Cabin south exterior	780	Y	N
L-03	La Honda White Barn:	48,000	Y	Y
L-04	Beatty House: Brown paint on wood exterior wall	1,500	Y	N
L-05	Beatty House: White paint on wood window frame	1,800	Y	N
L-06	Beatty House: White paint on wallboard wall in the living room	18,000	Y	Y
L-07	Beatty House: Brown paint on wood door frame between living room and kitchen	12,000	Y	Y
L-08	Beatty House: White paint on wood door frame in the kitchen	460	Y	N
L-09	Beatty House: White paint on glass and window frame on the exterior	43,000	Y	Y

mg/kg= Milligram per kilogram, ppm = parts per million

Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1). Disturbance of lead-based paints must be conducted in accordance with the EPA RRP rule.

4.0 REGULATORY SUMMARY

4.1 Asbestos

Disturbance of materials containing asbestos is regulated by Cal-OSHA in the Asbestos in Construction Industry Standard, 8 CCR 1529. Some of the key requirements are summarized below.

- Any individual who contracts to provide health and safety services relating to materials containing more than 0.1% asbestos must be certified by Cal-OSHA as either a Certified Asbestos Consultant or a Site Surveillance Technician. The activities that require certification include: conducting asbestos surveys; writing work plans or specifications for abatement; monitoring the work of abatement contractors; collecting air samples; and determining if the work area is safe for re-occupancy by non-asbestos workers. Regulation: Cal-OSHA 8 CCR 1529 (q)(1).
- If more than 100 square feet of materials that contain greater than 0.1% asbestos will be disturbed, the materials must be removed by a Cal-OSHA registered asbestos abatement contractor. Regulation: Cal-OSHA 8 CCR 1529 (r).
- ACMs that are classified by OSHA as thermal system insulation/surfacing materials are present. Removal of these materials is considered a Class I activity according to Cal-OSHA regulations. Work practices and engineering controls for Class I work are specified in Cal-OSHA 8 CCR 1529 (g) (4-6).
- ACMs that are classified by OSHA as other/miscellaneous materials are present. Removal of these materials is considered a Class II activity according to Cal-OSHA regulations. Work practices and engineering controls for Class II work are specified in Cal-OSHA 8 CCR 1529 (g) (7-8).
- Removal of friable ACMs greater than 100 square feet or 100 linear feet requires notification of the Bay Area Air Quality Management District ten (10) working days in advance of intended removal.
- Friable ACM waste must be manifested, transported, and disposed of as hazardous waste in accordance with the Department of Toxic and Substances Control (DTSC) and under a Waste Shipment Record as required by the Bay Area Air Quality Management District. DTSC regulates disposal of asbestos waste. DTSC issues U.S. EPA hazardous waste generator identification numbers.

4.2 Lead

Disturbing materials containing any detectable concentration of lead either through repair, maintenance, renovation or demolition activities triggers several regulations enforced by such agencies as OSHA (worker protection), EPA (environmental exposure, transportation and

disposal), and Department of Public Health (DPH). Some of the key requirements of the regulations are summarized below.

- There are presently no federal, state or local regulations limiting the concentration of lead in public sector buildings, however several regulations established for the private sector as well as for government subsidized housing are used industry wide as guidelines for assessing exposure to lead. The Consumer Product Safety Commission (CPSC) has set a maximum limit of 90 ppm in paint used for residential purposes. The Department of Housing and Urban Development (HUD) requires abatement of lead hazards involving paint in concentrations exceeding 5,000 ppm.
- Disposal of all lead-containing materials is regulated at concentrations at or exceeding 1,000 ppm as stated in 40 Code of Federal Regulations (CFR) Part 263 - Land Disposal Regulations and Title 22, Division 4 Environmental Health of the California Administrative Code. Lead containing materials that exceed 50 ppm must be additionally analyzed to determine possible waste disposal restrictions with respect to lead.
- Federal OSHA and Cal-OSHA regulate all worker exposure during construction activities that impact lead-containing paint. Cal-OSHA enforces the Lead in Construction Standard in Title 8 CCR 1532.1. The scope covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for re-painting, renovation, clean-up and routine maintenance. The OSHA specified method of compliance includes respiratory protection, protective clothing and equipment, housekeeping, hygiene facilities, medical surveillance, and training, among other requirements.

5.0 LIMITATIONS/GENERAL COMMENTS

Terracon did not perform sampling which required demolition or destructive activities such as knocking holes in walls, dismantling of equipment or removal of protective coverings. Reasonable efforts to access suspect materials within known areas of restricted access (e.g., crawl spaces) were made; however, confined spaces or areas which may pose a health or safety risk to Terracon personnel were not sampled. Sampling did not include suspect materials which could not be safely reached with available ladders/man-lifts.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the survey results, Terracon concludes the following:

- Asbestos was detected in various materials including vinyl floor tile and mastics, joint compound associated with drywall, thermal system insulation, ceramic tile mastic, sink undercoating, roof mastics, transite (asbestos cement) panels, metal roof cap sealant, and flashing sealant.
- If additional suspect materials that have not been characterized as ACM or non-ACM in this report are discovered during demolition, these materials should be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.
- Lead was detected above the laboratory detection limit on nine (9) various painted surfaces throughout the building. Two (2) of the painted surfaces had lead concentrations above 5,000 ppm, the threshold for designation of lead-based paint.

This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by ZFA Structural Engineers for specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

APPENDIX A
ZFA Structural Engineers - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin, Near

IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

HA No.	Material Description	Material Location	NESHAP Classification	% and Type Asbestos**	Estimated Quantity*
201	Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360 SF
204	Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% Chrysotile composite	3,700 SF

***Estimated quantities** are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey.
****% & Type Asbestos** = this column contains both the analytical result of the sample with the highest concentration of asbestos detected in the samples that make up the HA and the types of asbestos identified.

The materials listed in this table have been sampled and determined to contain asbestos in concentrations greater than 1%. When disturbed, various federal, state and local regulations may apply. These materials should be monitored for damage over time and repaired as necessary by appropriately trained personnel. Removal may be necessary before renovations and in most cases before a demolition. See Appendix B for a summary of samples collected. See Appendix C for detailed analytical results.

APPENDIX B

ASBESTOS SAMPLE LOCATION SUMMARY

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
Log Cabin							
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected	NA	NA	
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected	NA	NA	
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Orange Wood	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
3	3A	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected	NA	NA	
3	3B	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
3	3C	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
4	4A	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected	NA	NA	
4	4B	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
4	4C	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected	NA	NA	
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
6	6A	Wiring Black;Cabin	Black Coating	None detected	NA	NA	
6	6A	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6B	Wiring Black;Cabin	Black Coating	None detected			
6	6B	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6C	Wiring Black;Cabin	Black Coating	None detected			
6	6C	Wiring Black;Cabin	White Wiring Insulation	None detected			
7	7A	Concrete Foundation;Under Porch	White Concrete	None detected	NA	NA	
7	7B	Concrete Foundation;Under Porch	White Concrete	None detected			
7	7C	Concrete Foundation;Under Porch	White Concrete	None detected			
8	8A	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected	NA	NA	
8	8A	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8B	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8B	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8C	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8C	Wiring-White 1/8 in;Interior	Black Coating	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
9	9A	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9A	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
Barn							
100	100A	Wiring;Black 1/8 In;Interior Barn;N	Black Wiring Insulation	None detected	NA	NA	
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Wiring Insulation	None detected			
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Tar Insulator	None detected			
100	100C	Wiring;Black 1/8 In;Interior Barn;S	Black Wiring Insulation	None detected			
Beatty House							
200	200A	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected	NA	NA	
200	200B	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
200	200C	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
201	201A	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**	**Friable**	**Class 2**	**360 SF**
201	201A	Flooring Lino Tan; Living Rm	Black Felt	None detected	**RACM**		
201	201A	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201B	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201B	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201B	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201C	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201C	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201C	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected	NA	NA	
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
203	203A	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected	NA	NA	
203	203B	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			
203	203C	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
204	204A	Wallboard Joint Compound; Hall	Gray Fibrous Material with Multilayered Paint	None detected	**NA**	**Class 2**	**3,700 SF**
204	204A	Wallboard Joint Compound; Hall	White Drywall with Brown Paper and Multilayered Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Fibrous Material with White Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Drywall with Brown Paper	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Fibrous Material with White Paint	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Tan Joint Compound with Multilayered Paint**	**2% Chrysotile**			
204	204D	Wallboard Joint Compound; RR; West	White Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204E	Wallboard Joint Compound; East	Brown/Green Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	Cream Tape	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Joint Compound**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	White Drywall with Brown Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204F	Wallboard Joint Compound; South	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	Cream Tape	None detected			
204	204F	Wallboard Joint Compound; South	**Tan Joint Compound**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	White Drywall with Brown Paper	None detected			
204	204F	Wallboard Joint Compound; South	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204G	Wallboard Joint Compound; North	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	Cream Tape	None detected			
204	204G	Wallboard Joint Compound; North	**Tan Joint Compound**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	White Drywall with Brown Paper	None detected			
204	204G	Wallboard Joint Compound; North	**Composite by PLM Point Count**	**0.5% Chrysotile**			
205	205A	Flooring Hallway Gray; Hall; West	Black Felt with Pebbles and Gray Surface	None detected	NA	NA	
205	205B	Flooring Hallway Gray; Hall; Center	Black Felt with Pebbles and Gray Surface	None detected			
205	205C	Flooring Hallway Gray; Hall; East	Black Felt with Pebbles and Gray Surface	None detected			
206	206A	Cove Base/Flooring Creme Yellow Mastic; Kitchen; West	Cream Mastic with Yellow Paint	None detected	NA	NA	
206	206B	Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center	Cream Mastic with Yellow Paint	None detected			
206	206C	Cove Base/Flooring Creme Yellow Mastic; Kitchen; East	Cream Mastic with Yellow Paint	None detected			
207	207A	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected	NA	NA	
207	207B	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
207	207C	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Tan Linoleum with Fibrous Backing	None detected	NA	NA	
208	208A	Flooring Lino Tan; Kitchen; West	White Mastic	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Brown Fiberboard Flooring	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	Tan Linoleum with Fibrous Backing	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	White Mastic with Brown Fibrous Material	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Tan Linoleum with Fibrous Backing	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	White Mastic	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Brown Fiberboard Flooring	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
209	209A	Flooring Creme/Tan; Bath; East	Tan Flooring	None detected	NA	NA	
209	209A	Flooring Creme/Tan; Bath; East	Semi-Transparent Adhesive	None detected			
209	209A	Flooring Creme/Tan; Bath; East	Black Felt with Gray Coating	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Tan Flooring	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Semi-Transparent Adhesive	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Black Felt with Gray Coating	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Tan Flooring	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Semi-Transparent Adhesive	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Black Felt with Gray Coating	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Shingle with Green Pebbles	None detected	NA	NA	
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Tar	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Felt	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Shingle with Green Pebbles	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Tar	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Felt	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Felt	None detected			
211	211A	Concrete Porch	Gray Concrete	None detected	NA	NA	
211	211B	Concrete Porch	Gray Concrete	None detected			
211	211C	Concrete Porch	Gray Concrete	None detected			

APPENDIX C

ASBESTOS ANALYTICAL LABORATORY DATA

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin
EML ID: 2198987

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	27
Total Samples Analyzed:	27
Total Samples with Layer Asbestos Content > 1%:	0

Location: 1A, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447612-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1B, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447613-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1C, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447614-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 2A, Flooring-Lino Green Square Pattern;Kitchen-West

Lab ID-Version‡: 10447615-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 2B, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447616-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Orange Wood	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 2C, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447617-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 3A, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447618-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 3B, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447619-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 3C, Window Glaze;Ext Window Glaze-South Glass to Frame — Lab ID-Version‡: 10447620-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 4A, Fireplace Brick /Mortar;Living Rm -South — Lab ID-Version‡: 10447621-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4B, Fireplace Brick /Mortar;Living Rm -South — Lab ID-Version‡: 10447622-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4C, Fireplace Brick /Mortar;Living Rm -South — Lab ID-Version‡: 10447623-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 5A, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447624-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5B, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447625-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5C, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447626-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6A, Wiring Black;Cabin Lab ID-Version‡: 10447627-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 6B, Wiring Black;Cabin

Lab ID-Version‡: 10447628-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6C, Wiring Black;Cabin

Lab ID-Version‡: 10447629-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 7A, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447630-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 7B, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447631-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 7C, Concrete Foundation;Under Porch Lab ID-Version‡: 10447632-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 8A, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447633-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8B, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447634-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8C, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447635-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 9A, Wiring-Black 1/4 in;Cabin

Lab ID-Version‡: 10447636-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9B, Wiring-Black 1/4 in;Cabin

Lab ID-Version‡: 10447637-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9C, Wiring-Black 1/4 in;Cabin

Lab ID-Version‡: 10447638-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Attachment 2

002198987

Terracon

☐PM – S. Steiner sgsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET**
	☐PM – T. Kattchee takattchee@terracon.com		☒ PLM Analysis (Analyze all samples)
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	☐ Stop Analysis at First Positive
☐PM – W. Frieszell wmfrieszell@terracon.com			☐ Point Count Analysis (1000-point)
			PAGE 1 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3 -4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)*****

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 1	Material Description – Flooring – Lino 1X1 Squares TAN/Beige	
Sample ID	**Sample Location & Material Location**	**Quantity:** 120
1A	Rest Room – North	10X12
1B	|	
1C	|	

HM# 2	Material Description- Flooring – Lino Green Square Pattern	
Sample ID	**Sample Location & Material Location**	**Quantity:** 625
2A	Kitchen – West	25X25
2B	|	
2C	|	

HM# 3	Material Description- window Glaze	
Sample ID	**Sample Location & Material Location**	**Quantity:** 18ea 300 LF
3A	ext window Glaze-South Glass to Frame	
3B	|	
3C	|	

HM# 4	Material Description Fire place Brick/mortar	
Sample ID	**Sample Location & Material Location**	**Quantity:** 1500 SF
4A	Living Rm – South	
4B	|	
4C	|	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 950
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

002198987

Attachment 2

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kattchee takattchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 2 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# RI197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-4DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******
*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 5	Material Description – Roof felt Double Layer under wood Shingle	
Sample ID	Sample Location & Material Location	Quantity:
5A	Roof	
5B		
5C		

HM# 6	Material Description- Wiring Black 3/4	
Sample ID	Sample Location & Material Location	Quantity:
6A	cabin	
6B		
6C		

HM# 7	Material Description- concrete foundation	
Sample ID	Sample Location & Material Location	Quantity:
7A	under Porch	
7B		
7C		

HM# 8	Material Description Wiring – White 1/8 in	
Sample ID	Sample Location & Material Location	Quantity:
8A	Interior	
8B		
8C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 95
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

Attachment 2

002198987

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 9	Material Description – wiring – Black 1/4 in	
Sample ID	**Sample Location & Material Location**	**Quantity:**
9A	cabin	
9B		
9C		

HM#	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**

HM#	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**

HM#	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[illegible]	**Date/ Time:**	7/5/19 FedEx 95c
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-LA Honda White Barn
EML ID: 2198983

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

REVISED REPORT

Dates of Analysis:
Asbestos PLM: 07-09-2019 and 07-10-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	3
Total Samples Analyzed:	3
Total Samples with Layer Asbestos Content > 1%:	0

Location: 100A, Wiring;Black 1/8 In;Interior Barn;N

Lab ID-Version‡: 10447309-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100B, Wiring;Black 1/8 In;Interior Barn;C

Lab ID-Version‡: 10447310-2

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Black Tar Insulator	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100C, Wiring;Black 1/8 In;Interior Barn;S

Lab ID-Version‡: 10447311-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

SUMMARY OF REVISIONS

Location: 100B; Wiring;Black 1/8 In;Interior Barn;C Lab ID-Version‡: 10447310-2
Analysis Time revised. Sample Layers revised.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

002198983

Attachment 2

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kattchee takattchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA WHITE BARN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB ______ TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 100	Material Description – Wiring - Black 1/8 in	
Sample ID	Sample Location & Material Location	Quantity: 80 LF
100A	Interior Barn - N	
100B	- C	
100C	- S	

HM# 101	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
101A		
101B		
101C		

HM# 102	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
102A		
102B		
102C		

HM# 103	Material Description	
Sample ID	Sample Location & Material Location	Quantity:
103A		
103B		
103C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[illegible]	Date/ Time:	7/5/19 FedEx 930
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2198988

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted: 40
Total Samples Analyzed: 40
Total Samples with Layer Asbestos Content > 1%: 7

Location: 200A, Window Putty; Ext Windows

Lab ID-Version‡: 10447674-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200B, Window Putty; Ext Windows

Lab ID-Version‡: 10447675-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200C, Window Putty; Ext Windows

Lab ID-Version‡: 10447676-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 201A, Flooring Lino Tan; Living Rm

Lab ID-Version‡: 10447677-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 201B, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447678-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 201C, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447679-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 202A, Flooring Multi Layer; Back Room; 4 Lab ID-Version‡: 10447680-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202B, Flooring Multi Layer; Back Room; 4

Lab ID-Version‡: 10447681-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202C, Flooring Multi Layer; Back Room; 4 Lab ID-Version‡: 10447682-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 203A, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447683-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203B, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447684-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203C, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447685-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204A, Wallboard Joint Compound; Hall Lab ID-Version‡: 10447686-1

Sample Layers	Asbestos Content
Gray Fibrous Material with Multilayered Paint	ND
White Drywall with Brown Paper and Multilayered Paint	ND
Composite Non-Asbestos Content:	20% Cotton 10% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 204B, Wallboard Joint Compound; Ceil; Living Rm Lab ID-Version‡: 10447687-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204C, Wallboard Joint Compound; Ceil; Back; 4 Lab ID-Version‡: 10447688-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204D, Wallboard Joint Compound; RR; West Lab ID-Version‡: 10447689-1

Sample Layers	Asbestos Content
Tan Joint Compound with Multilayered Paint	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Moderate

Comments: Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204E, Wallboard Joint Compound; East

Lab ID-Version‡: 10447690-1

Sample Layers	Asbestos Content
Brown/Green Paper	ND
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204F, Wallboard Joint Compound; South

Lab ID-Version‡: 10447691-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204G, Wallboard Joint Compound; North

Lab ID-Version‡: 10447692-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205A, Flooring Hallway Gray; Hall; West

Lab ID-Version‡: 10447693-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205B, Flooring Hallway Gray; Hall; Center Lab ID-Version‡: 10447694-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 205C, Flooring Hallway Gray; Hall; East Lab ID-Version‡: 10447695-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 206A, Cove Base/Flooring Creme Yellow Mastic; Kitchen; West Lab ID-Version‡: 10447696-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 206B, Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center Lab ID-Version‡: 10447697-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 206C, Cove Base/Flooring Creme Yellow Mastic; Kitchen; East Lab ID-Version‡: 10447698-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 207A, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447699-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207B, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447700-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207C, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447701-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 208A, Flooring Lino Tan; Kitchen; West Lab ID-Version‡: 10447702-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 208B, Flooring Lino Tan; Kitchen; Center Lab ID-Version‡: 10447703-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic with Brown Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 208C, Flooring Lino Tan; Kitchen; East Lab ID-Version‡: 10447704-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 209A, Flooring Creme/Tan; Bath; East Lab ID-Version‡: 10447705-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 209B, Flooring Creme/Tan; Bath; Center — Lab ID-Version‡: 10447706-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 209C, Flooring Creme/Tan; Bath; West — Lab ID-Version‡: 10447707-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 210A, Roofing; Shingles; Green; Roof; NW — Lab ID-Version‡: 10447708-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 210B, Roofing; Shingles; Green; Roof; SW — Lab ID-Version‡: 10447709-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 210C, Roofing; Shingles; Green; Roof; West — Lab ID-Version‡: 10447710-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	12% Glass Fibers 10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 211A, Concrete Porch — Lab ID-Version‡: 10447711-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211B, Concrete Porch — Lab ID-Version‡: 10447712-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211C, Concrete Porch — Lab ID-Version‡: 10447713-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Attachment 2

002198988

Terracon

- ☐PM – S. Steiner sosteiner@terracon.com
- ☐PM – K. Schroeter kmschroeter@terracon.com
- ☐PM – K. Pilgrim kmpilgrim@terracon.com
- ☐PM – T. Kalitchee takaitchee@terracon.com
- ☒PM- M. Benefield msbenefield@terracon.com
- ☐PM D. Block David.block@terracon.com
- ☐PM – D.WALLEN d.wallen@terracon.com
- ☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB ____ TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*

***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 200	Material Description – WINDOW Putty	
Sample ID	Sample Location & Material Location	Quantity: 200 LF
200A	Ext windows	14 windows
200B		3x4
200C		

HM# 201	Material Description- Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 360 S.F
201A	Living Rm	18x20
201B		
201C		

HM# 202	Material Description- Flooring multi layer	
Sample ID	Sample Location & Material Location	Quantity: 625 SF
202A	Back Room -4	25x25
202B		
202C		

HM# 203	Material Description flooring Dark Gray flower pat	
Sample ID	Sample Location & Material Location	Quantity: 320 S.F
203A	Bed room -1 -	16x20
203B		
203C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kaltchee takaltchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 2 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 204	Material Description – Wallboard Joint compound	
Sample ID	Sample Location & Material Location	Quantity:
204 A	Hall –	(480 Sqft House)
B	ceil – Living Rm	
C	ceil – Back Rm – 4	
HM# 204	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
D	RR – West	
E	East	
F	South	
HM# 204	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:
204 G	North	
HM#	Material Description	
Sample ID	Sample Location & Material Location	Quantity:

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

002198988

Attachment 2

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples) -
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3 ~~5~~ DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

DRAFT

HM# 205	Material Description – Flooring Hallway Gray	
Sample ID	Sample Location & Material Location	Quantity: 110 SF
205A	Hall – west	27X4
205 B	– center	
205C	– East	

HM# 206	Material Description- Cove base / flooring Creme Yellow mastic	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
206A	Kitchen – west	14X4
206 B	– center	
206C	– East	

HM# 207	Material Description- Flooring Peach / TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
207A	Bedroom 2 –	12X16
207 B	–	
207C	–	

HM# 208	Material Description Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
208A	Kitchen – West	14X14
208 B	– center	
208 C	– East	

Relinquished By: M.HARRINGTON	Signature: MH	Date/Time: 07-3-19
Received By:	Signature: [illegible]	Date/ Time: 7/5/19 FedEx 950
Relinquished By:	Signature:	Date/Time:
Received By:	Signature:	Date/Time:

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

Attachment 2

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com ☐PM – T. Kattchee takattchee@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET** ☒ PLM Analysis (Analyze all samples) ☐ Stop Analysis at First Positive ☐ Point Count Analysis (1000-point)
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	
☐PM – W. Frieszell wmfrieszell@terracon.com			PAGE 4 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB ______ **TAT** ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 209	Material Description – Flooring Creme / Tan	
Sample ID	**Sample Location & Material Location**	**Quantity:** 200 sf
209A	Bath – East	
209B	– center	
209C	– west	
HM# 210	**Material Description-** Roofing – shingles – Green	
Sample ID	**Sample Location & Material Location**	**Quantity:** 600 sf
210 A	Roof – NW	
210 B	– SW	
210 C	– west	
HM# 211	Material Description- concrete	
Sample ID	**Sample Location & Material Location**	**Quantity:**
211A	porch –	
211B	–	
211C	–	
HM#	**Material Description**	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 9:52
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

APPENDIX D

LEAD ANALYTICAL LABORATORY DATA

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Lead Paint Chip Analysis Report

Report Number: 19-07-01313

Client: Eurofins EMLab P&K
4101 Shuffel Street NW
North Canton, OH 44720

Received Date: 07/09/2019
Analyzed Date: 07/10/2019
Reported Date: 07/10/2019

Project/Test Address: 2199222
Collection Date:

Client Number:
201676

Fax Number:
330-497-0772

Laboratory Results

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
19-07-01313-001	L-1		4200	0.42	
19-07-01313-002	L-2		780	0.078	

Preparation Method: ASTM E-1979-17
Analysis Method: EPA SW846 7000B
Accreditation #: OH 10028

Reviewed By Authorized Signatory:

Tariq Mohammed
QC Clerk

The HUD lead guidelines for lead paint chips are 0.50% by Weight, 5000 ppm, or 1.0 mg/cm². The Reporting Limit (RL) for samples prepared by ASTM E-1979-17 is 10.0 ug Total Pb. The RL for samples prepared by EPA SW846 3050B is 25.0 ug Total Pb. Paint chip area and results are calculated based on area measurements determined by the client. All internal quality control requirements associated with this batch were met, unless otherwise noted.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, area, etc., was provided by the client. Results reported above in mg/cm3 are calculated based on area supplied by client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C.

ELLAP Accredtitation through AIHA-LAP, LLC (100420), NY ELAP #11714.

LEGEND	Pb= lead	ug = microgram	ppm = parts per million
	ug/g = micrograms per gram	Wt. = weight	

EHS Laboratories™

Environmental Hazards Services, LLC

Lead Chain-of-Custody Form

SHIP TO: 7469 Whitepine Rd. Richmond, VA 23237
Phone: (800) 347-4010 FAX: (804) 275-4907
ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT:
www.leadlab.com

19-07-01313
Due Date:
07/10/2019
(Wednesday)
E
EG

2 JL 7/9/19

Company Name: Eurofins EMLab P&K Account Number: 201676

Address: 1501 W Knudsen Dr City/State/Zip: Phoenix AZ 85027

Phone : 623) 298-1014 Email : ahetherington@emlabpk.com Fax:

Project Name / Testing Address: 2199222 Project City/State (Required):

Collected By: Certification Number: P.O. #: Do wipe samples submitted meet ASTM E1792 requirements? ○ Yes ○ No

Sample Type - Key For Grid	Sample Location Abbreviations - Key For Grid	Surface Type for Dust Wipes – Key For Grid
Single Dust Wipe = DW; Air = A; Paint Chip = PC; Soil = S; Composite Soil = CS	FR = Family Room; LR = Living Room; DN = Den; F = Front; R = Rear; LT = Left; 1 = 1stFL; 2 = 2ndFL; RT = Right; BA = Bath; DR = Dining Room; KT = Kitchen; BR = Bedroom; O = Basement	FL = Floor; CP = Carpet; SL = Window Sill; WW = Window Well

TURN AROUND TIMES: IF NO TAT IS SPECIFIED, SAMPLE(S) WILL BE PROCESSED AND CHARGED AS 3 DAY TAT.

● 1 Day ○ 2 Day ○ 3 Day ○ * Same Day – Must Call Ahead ○ * Weekend - Must Call Ahead

No.	Client Sample ID	Collection Date	Collection Time	Sample Type	Collection Location (LR, KT, LTFBR, RTRBR, etc.)	Surface Type	Area: Length X Width in inches (Provide paint chip area only if requesting mg/cm2)	Paint Chip: mg/cm²	Paint Chip: % by weight	Air: Total Time (minutes)	Air: Flow Rate (L/min)	Air: Volume Total (Liters)	Comments
1	L-1		A.M./P.M.	PC			X	X		→ PPM / % by weight per Kara 7/9/19			
2	L-2		A.M./P.M.	PC			X	X					
3			A.M./P.M.				X						
4			A.M./P.M.				X						
5			A.M./P.M.				X						
6			A.M./P.M.				X						
7			A.M./P.M.				X						
8			A.M./P.M.				X						
9			A.M./P.M.				X						
10			A.M./P.M.				X						

Released by: Kendra Griffith	Signature: K Griffith	Date/Time: 7/5/19	
Received by: D. Emory	Signature: D. Emory	Date/Time: 7/9/19 11:05AM	

DRAFT

Attachment 2

Attachment 2

002199222

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant			
☐ PM – S. Steiner apsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com			
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kattchee sskattchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-1	Paint Color: Green Substrate: wood Component: Floor Sample Location: Bldg # cabin Unit # west Room Kit	F
L-2	Paint Color: white Substrate: Glass wood Component: window Sample Location: Bldg # cabin Unit # South Room Ext	F
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	7-3-19
Received By:		**Signature:**		**Date/ Time:**	7/5/19 FedEx 950
Received By:		**Signature:**		**Date/Time:**	

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #:	JP191014468
Project #:	3042679
Receipt Date:	8-Jul-2019
Analysis Date:	10-Jul-2019
Report Date:	10-Jul-2019

2199099

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-3	**Paint Chip**	**48000**	**4.8%**

Reporting Limit = 50.0 mg/kg N/A = Not Applicable
INS = Insufficient Sample Weight NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

14468

J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
City/State:	Phoenix, AZ **Zip:** 85027	**City/State:**	North Canton, OH **Zip:** 44720
		PO #:	3042679 Per S.D./n.t.

Project Information

Project Name: 2199099	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☐	2 Day ☐	3 Day ☑	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ **NIOSH 9002** ○ **OSHA ID-191**	○ **NIOSH 7400** ○ **ASTM D7201** ○ **ISO 8672** ○ **OSHA ID-160**	○ **AHERA** ○ **NIOSH 7402** ○ **ASTM D6281** ○ **ISO 10312** ○ **ISO 13794**	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ **EPA 100.2** Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ **EPA 100.2** Effluent / WW	○ **ASTM D5755** Microvac ○ **ASTM D6480** Wipe ○ **600/J-93/167** Carpet - EPA ○ Bulk Dust Qualitative	○ **ASTM 7521**-TEM (+/-) ○ **ASTM 7521**-TEM (<1%) ○ **CARB 435**-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS / SILICA/PARTICULATES

Flame AA	Graphite Furnace AA - LEAD	ICP	X-Ray Diffraction / Gravimetric
☒ Lead in Paint – **SW846 7420/3050B** ○ Lead in Air – **NIOSH 7082** ○ Lead in Wipes – **SW846 7420/3050B** ○ Lead in Soil – **SW846 7420/3050B**	○ Drinking Water – **EPA 200.9** ○ Wastewater – **SW846-7421** ○ Soil/Sludge – **SW846-7421** ○ Air – **NIOSH 7105**	○ Elements in Air – **NIOSH 7300** ○ Wipe/Soil – **SW846-6010B** ○ Effluent – **SW846-6010B** ○ Welding Fume – **NIOSH 7300M** ○ TCLP – **SW846-1311/6010B**	○ Respirable Crystalline Silica **NIOSH 7500 / OSHA 142** ○ **NIOSH 0500** – Total Particulates ○ **NIOSH 0600** – Respirable Particulates

Total Number of Samples Submitted: 1

Positive Stop: ☐ YES ☐ NO

Signatures

Relinquished By:	[signature]	**Date:** 7/5/19	**Time:**
Received By:	Ruby Gonzalez	**Date:** 7/8/19	**Time:** 9:30
Relinquished By:		**Date:**	**Time:**
Received By:		**Date:**	**Time:**

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

Attachment 2

IH CHAIN OF CUSTODY

Project Name/Number 2199099

Page 2 of 2

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-3		

Comments/Special Instructions:

Attachment 2

002199099

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant
☐ PM – S. Steiner spsteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com

☐ PM – K. Pilgrim kimpilgrim@terracon.com	☒ PM- M. Benefield mbenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kettchee takettchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA WHITE BARN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☐ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-3	Paint Color: White Substrate: wood Component: Siding Sample Location: Bldg # upper strip under eve Unit # barn Room ext	P
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	7-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 950
Received By:		**Signature:**		**Date/Time:**	

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2199075

Approved by:

Joshua T. Cox

Operations Manager
Joshua Cox

Dates of Analysis:
Lead Analysis (sub-contracted): 07-09-2019

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the samples as received.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #:	JP191014467
Project #:	3042648
Receipt Date:	8-Jul-2019
Analysis Date:	9-Jul-2019
Report Date:	9-Jul-2019

2199075

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-4	Paint Chip	1500	0.15%
L-5	Paint Chip	1800	0.18%
L-6	Paint Chip	18000	1.8%
L-7	Paint Chip	12000	1.2%
L-8	Paint Chip	460	0.046%
L-9	Paint Chip	43000	4.3%

Reporting Limit = 50.0 mg/kg   N/A = Not Applicable
INS = Insufficient Sample Weight   NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

J3 Order (Lab use only) 14467

J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
		City/State:	North Canton, OH **Zip:** 44720
City/State:	Phoenix, AZ **Zip:** 85027	**PO #:**	3042648 Per D.H./n.t.

Project Information

Project Name: 2199075	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☑	2 Day ☐	3 Day ☐	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS / SILICA/PARTICULATES

Flame AA	Graphite Furnace AA - LEAD	ICP	X-Ray Diffraction / Gravimetric
☒ Lead in Paint – SW846 7420/3050B ○ Lead in Air – NIOSH 7082 ○ Lead in Wipes – SW846 7420/3050B ○ Lead in Soil – SW846 7420/3050B	○ Drinking Water – EPA 200.9 ○ Wastewater – SW846-7421 ○ Soil/Sludge – SW846-7421 ○ Air – NIOSH 7105	○ Elements in Air – NIOSH 7300 ○ Wipe/Soil – SW846-6010B ○ Effluent – SW846-6010B ○ Welding Fume – NIOSH 7300M ○ TCLP – SW846-1311/6010B	○ Respirable Crystalline Silica NIOSH 7500 / OSHA 142 ○ NIOSH 0500 – Total Particulates ○ NIOSH 0600 – Respirable Particulates

Total Number of Samples Submitted: 6	**Positive Stop:** ☐ YES ☐ NO

Signatures

Relinquished By:	[signature]	**Date:** 7/5/19	**Time:**
Received By:	Ruby Gonzalez	**Date:** 7/8/19	**Time:** 9:30am
Relinquished By:		**Date:**	**Time:**
Received By:		**Date:**	**Time:**

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

IH CHAIN OF CUSTODY

Attachment 2

Project Name/Number 2199075

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-4		
L-5		
L-6		
L-7		
L-8		
L-9		

Comments/Special Instructions:

Attachment 2

002199075

Terracon

E-MAIL REPORT TO: PROJECT MANAGER (PM)

☐ denise.walten@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐PM – S. Steiner spsteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒PM- M. Bonefield msbonefield@terracon.com	☐PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kaltchee tokaltchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EnLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-4	Paint Color: Brown Substrate: wood Component: wall Sample Location: Bldg # ext wall Unit # west Room	P
L-5	Paint Color: White Substrate: wood Component: window Sample Location: Bldg # window frame Unit # Room	P
L-6	Paint Color: White Substrate: Drywall Component: wall Sample Location: Bldg # Unit # Room Liv Rm	P
L-7	Paint Color: Brown Substrate: wood Component: Door frame Sample Location: Bldg # Unit # Room Liv / Kit	P
L-8	Paint Color: White Substrate: wood Component: Kit Sample Location: Bldg # Unit # Door frame Room wall	P

Relinquished By: M.HARRINGTON **Signature:** MH [signature] **Date/Time:** 7-3-19

Received By: **Signature:** **Date/ Time:** 7/5/19 FedEx 950

Received By: **Signature:** **Date/Time:**

Attachment 2

002199075

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐PM – S. Steiner spsteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒PM- M. Benefield msbenefield@terracon.com	☐PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kattchee tekattchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) ____ TTLC

PAGE 2 OF 2

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-9	Paint Color: White Substrate: window putty Component: Glass Wood Sample Location: Bldg # ____ Unit # ____ Room Ext 14 windows 4x5 200 LF	F
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	
	Paint Color: ____ Substrate: ____ Component: ____ Sample Location: Bldg # ____ Unit # ____ Room ____	

Relinquished By: M.HARRINGTON	**Signature:** MH [signature]	**Date/Time:** 7-3-19	7/5/19 FedEx 950
Received By:	**Signature:**	**Date/ Time:**	
Received By:	**Signature:**	**Date/Time:**	

APPENDIX E

LICENSES AND CERTIFICATIONS

Attachment 2

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Michael H Reed
Name

Certification No. **08-4464**

Expires on **12/18/19**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 2

California Department of PublicHealth

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
 Micheal Reed	Lead Sampling Technician	LRC-00000224	5/21/2020

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual’s photo and name to another valid form of government issued photo identification. Verify the individual’s certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

Attachment 2

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Michael D Harrington
Name

Certification No. **01-3017**

Expires on **12/05/19**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 2

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Michael S Benefield
Name

Certification No. **06-3938**

Expires on **02/15/20**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

State of California Department of Public Health

Lead-Related Construction Certificate

Certificate Type	Expiration Date
Inspector/Assessor	03/28/2020
Project Monitor	03/28/2020

Michael S. Benefield

ID #: 10445

APPENDIX F

PHOTOGRAPHS

Photo 1 La Honda Log Cabin

Photo 2 La Honda White Barn

Photo 3 Beatty House

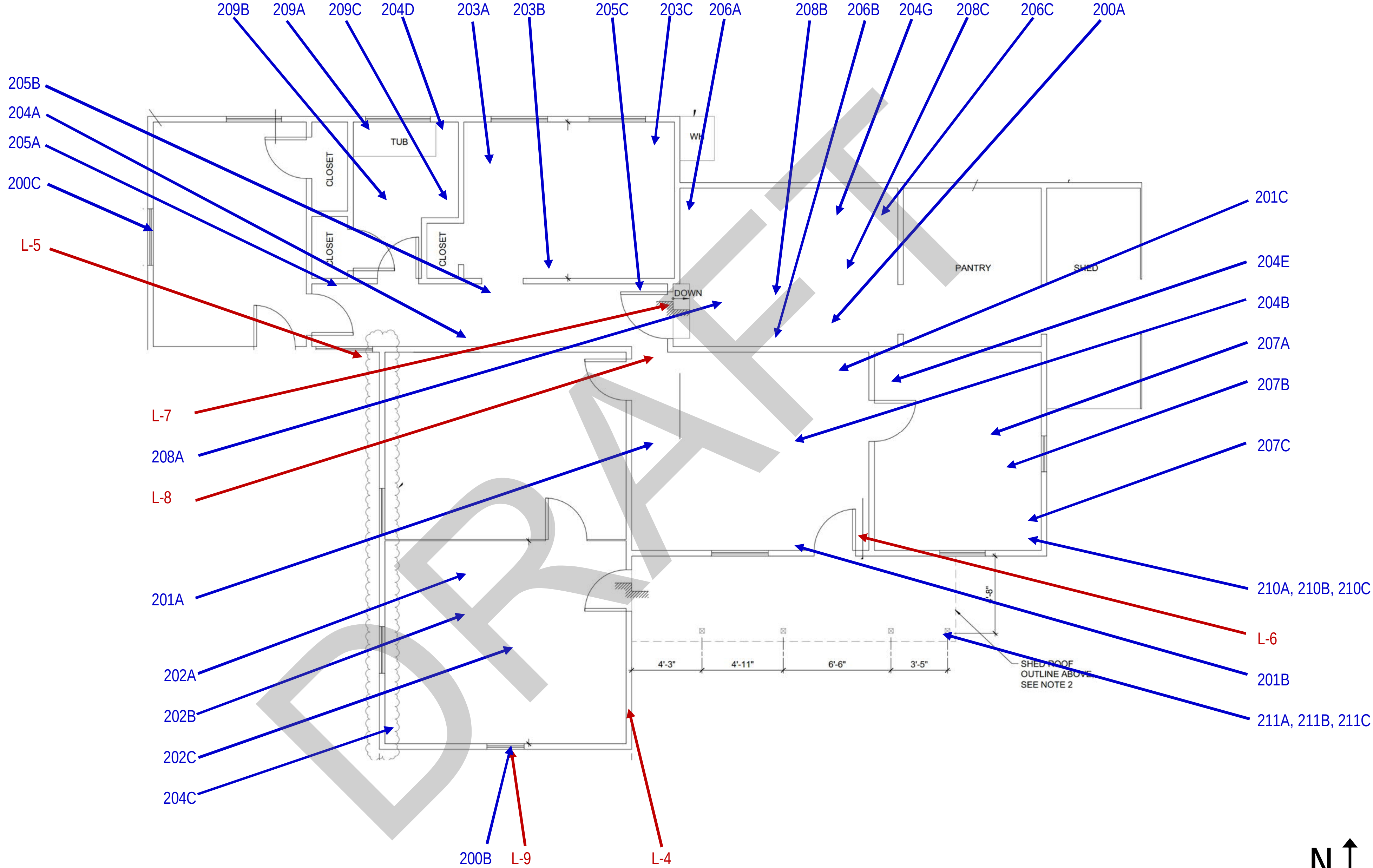
Photo 4 Material 204 - ACM joint Compound on wallboard walls and ceilings in the Beatty House

Photo 5 Material 201 ACM vinyl sheet flooring in the Beatty House

APPENDIX G

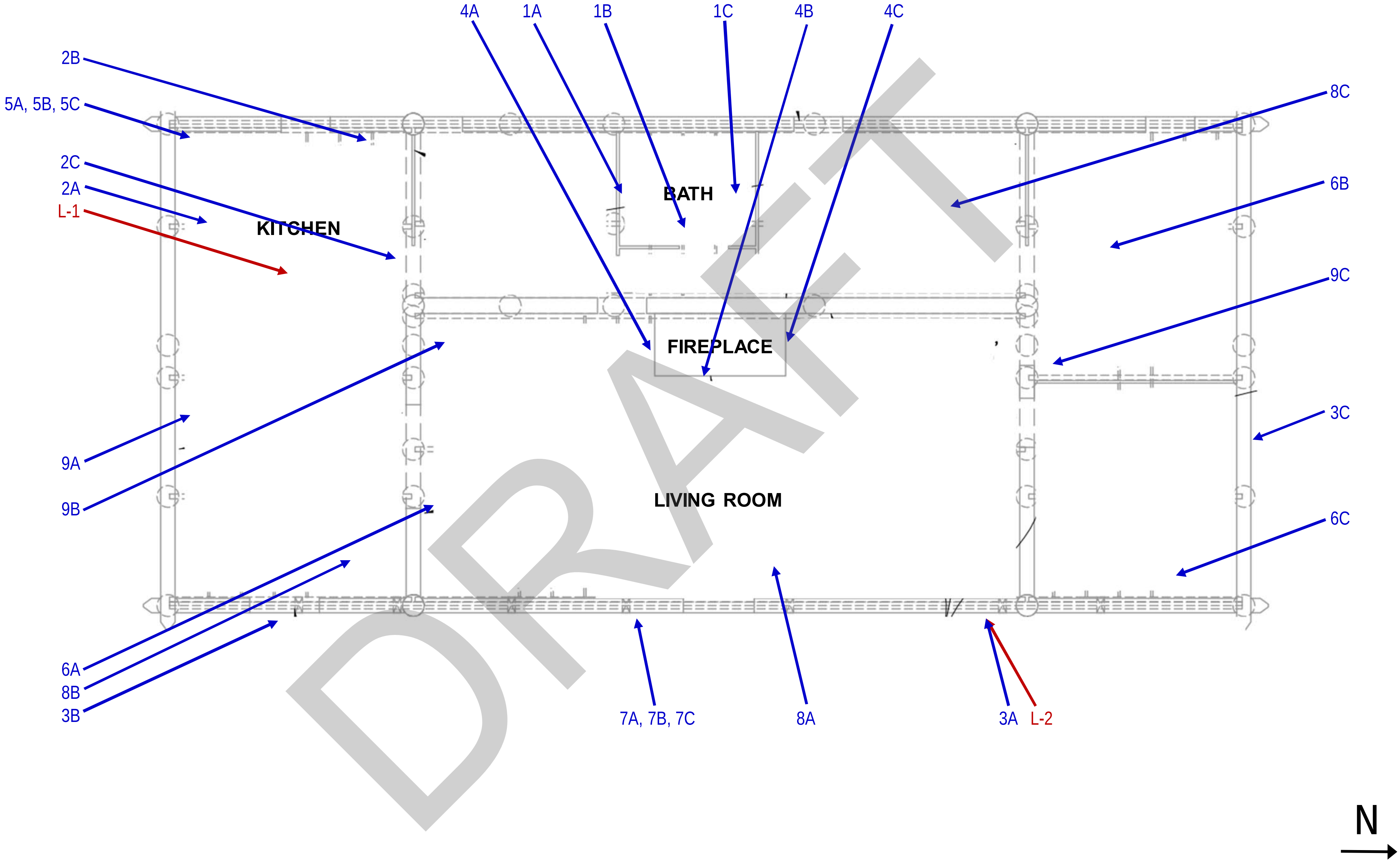
SAMPLE LOCATION DRAWINGS

Attachment 2



Terracon	Beatty House La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2

Attachment 2



Terracon	Redwood Log Cabin La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2

Sample L-3 white paint on wood siding collected from exterior of barn

Samples 100A, 100B, and 100C Black 1/8" wiring collected from interior of barn

Terracon	White Barn	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 3

EXHIBIT E

Structural Surveys for Special-Status Mammal Species

by Swaim Biological, Incorporated

Swaim Biological, Incorporated
4435 First Street PMB #312
Livermore, CA 94551

TO	Matthew Chaney, Midpeninsula Regional Open Space District 330 Distel Circle Los Altos, Ca 94022
FROM	Karen Swaim and Ryan Byrnes, Swaim Biological Incorporated 4435 First Street Livermore, CA 94551
DATE	June 30, 2019
SUBJECT	La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands and Rancho San Antonio Preserve – Structural Surveys for Special-Status Mammal Species

1. INTRODUCTION AND BACKGROUND

Per Midpeninsula Regional Open Space District's (District) request, Swaim Biological Incorporated (SBI) has conducted habitat and occupancy surveys for special status mammal species at the La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands (Guisti Property) and Rancho San Antonio Preserve in June 2019. Surveys evaluated structures and the surrounding areas in preparation for structure stabilization and demolition projects. SBI's qualified biologists surveyed for San Francisco dusky-footed woodrats (*Neotoma fuscipes annectens*) and roosting bats at nine (9) structures, twelve (12) storage tanks and multiple debris piles at six (6) separate locations. This report details the methods and provides a summary of our survey results and recommendations. A follow-up bat emergence survey was conducted at the Sierra Azul Preserve - Beatty Property by District Biologist Matthew Chaney on July 30, 2019.

2. METHODS

Special Status Bat Surveys

Surveys for bats are difficult to standardize because of the large amount of variability that exists at individual survey sites and among survey sites in a project area, much less across the range of a species. Nevertheless, several practices were used to survey for bats, including; bat habitat assessments, daytime maternity roost and signs of bats use surveys (i.e., guano pellets and urine staining), emergence surveys, and acoustic surveys.

SBI biologists conducted a daytime bat survey at each location to determine if the structures, storage tanks, and associated debris piles are currently in use by bats. During the surveys, the biologists inspected habitat

features on the exterior of each structure and searched for bats or signs of bat occupancy including maternity roosts, day roosting bats, guano pellets and urine staining. Coordinates and photographs were taken of each roost identified.

The bat emergence and acoustic surveys began one-half hour before sunset and continued until at least one hour after sunset or until it was otherwise too dark to see emerging bats. Surveyors positioned themselves so that emerging bats would be silhouetted against the sky as they exited the roost. Surveyors were close enough to the roost to observe all exiting bats, but not close enough to influence emergence. Acoustic detectors were deployed in conjunction with emergence survey efforts to monitor bat activity within the proposed project area. Bat vocalization calls were recorded with SonoBatLIVE (using the Petterson M500 USB mic), Anabat Swift, and Pettersson D500 (bat acoustical detectors). Bat vocalization files were analyzed and vetted through SonoBat 4.4 using the SonoVet utility (bat call analysis software) by qualified biologists.

In locations where suitable bat habitat was observed but no bats or signs of bats were observed, absence is not presumed. Bats may switch roosts on a nightly basis and the surveys conducted are not interpreted as presence/absence surveys.

Bat occupancy was determined as a potential maternity colony whenever an aggregate of bats were observed roosting or emerging at a specific structure. Classification as a maternity colony is a conservative/cautious estimate for aggregates of bats and is therefore not discriminating between non-reproductive male or female roosts. A single bat could be a "maternity colony" (i.e. One adult bat with a pup) and even small maternity roosts could represent a large portion of the local bat population and are therefore "significant". Bats (including females with pups) may switch roosts on a nightly basis and therefore might use suitable habitat, if present, though not observed during the surveys. Therefore, we classified and reported aggregates of bats observed as maternity colonies during the summer/maternity season.

San Francisco Dusky-footed Woodrat Surveys
SBI qualified biologists also conducted detailed surveys for woodrats by searching the interior and exterior of all structures, storage tanks (exterior only), and associated debris piles for signs of woodrat occupancy (nests and droppings) within 50-foot of the project area. SBI flagged and photographed any nests that were encountered. Coordinates of each nest was recorded along with a description of the nest.

3. SURVEY RESULTS

Survey results for each survey location are provided below. Site specific recommendations are provided at the end of each location section. Descriptions of recommendations for all sites are compiled at the end of the report.

3.1 LA HONDA CREEK PRESERVE – WHITE BARN (DYER BARN)

SUMMARY

The survey for White Barn on Allen Road, Woodside, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures (Photo 1-2). Three roosting bats were detected during the daytime survey. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn surveyed receives partial shade from the riparian corridor to the west (Photo 3). Surrounding the barn is signs of wetland / wet meadow as demonstrated by the presence of (giant plantago (*Plantago major*), sedges (*Scirpus spp.*), elderberry (*Sambucus nigra spp. Caerulea.*), and willows (*Salix sp*). A concrete drainage adjacent to the east side of the barn appears to drain overland flow into the adjacent drainage (Photo 4). The barn itself is in a flat that leads to a downstream ravine and riparian corridor. The interior of the barn (Photo 5 and 6) is comprised of one area subdivided into sections by feeding stalls, an interior enclosed chicken coop, and an open space area. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 7).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the floor, roof and the walls of the barn. The gaps as well as multiple missing wood slats allow bats to easily enter the building and roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof. Moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat, no other structures or outbuildings were observed in the immediate area to provide additional maternity roost habitat. Suitable bat foraging habitat is found throughout the White Barn survey area.

Bat guano was observed in the interior of the structure on the floor along the north wall (Photo 8). Three *Myotis sp.* (Photo 9 and 10) were observed day roosting in these rafters on the north side of the barn. Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat.

Rodent sign is present throughout the structure with multiple large grass nests (Photo 11) and a significant number of rodent droppings observed (Photo 12). While the biologists were within the chicken coop, they heard a rodent scurrying directly overhead. No woodrat nests were observed on the premises or within the 50-foot buffer. There was a woodrat squeaking repeatedly in the nearby riparian corridor although no middens were observed where the noise was coming from.

DISCUSSION AND RECOMMENDATIONS

Suitable bat roost habitat is present within the structure and moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat. Based on the observed presence of at least three bats roosting within the structure this site is presumed to be serving as a maternity roost.

No signs of woodrats were present in the structure or surrounding natural habitat. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

Recommendations for the White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- The need for replacement habitat due to impacts on the maternity roost per District guidelines is dependent upon whether the planned stabilization activities will eliminate roosting habitat. Determination of the need for replacement habitat plan should coincide with the development of the deterrent plan.

Photo 1. White Barn exterior.

Photo 2. White Barn exterior.

Photo 3. White Barn exterior missing wooden slats and entry points for bats.

Photo 4. Concrete drainage to the east of White Barn that feeds into the riparian corridor.

Photo 5. Interior of White Barn.

Photo 6. Interior of White Barn.

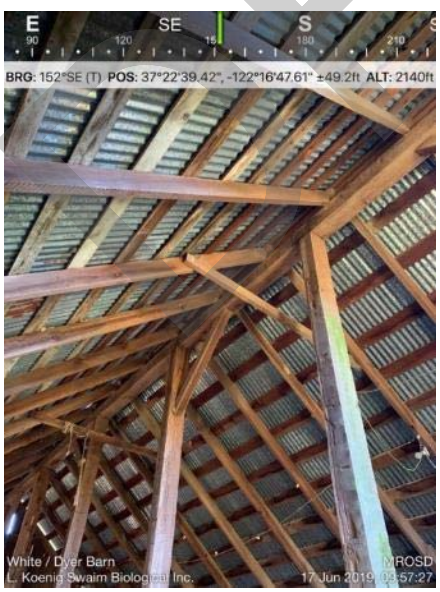


Photo 7. Corrugated roof slats and rafters provide suitable bat roosting habitat.

Photo 8. Bat guano present on the floor.

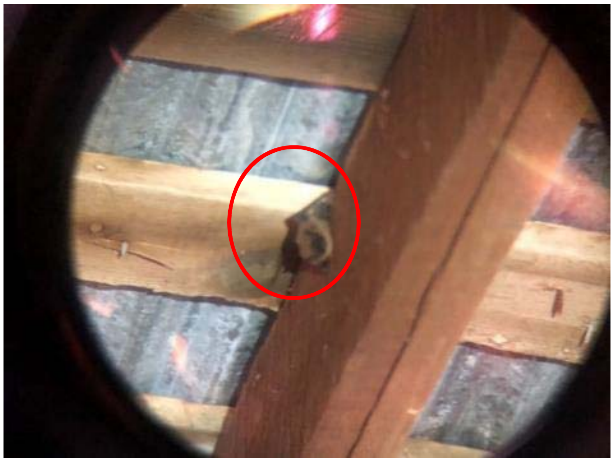


Photo 9. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 10. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 11. Rodent nests observed within the barn. These grass nests are most likely deer mouse (*Peromyscus sp.)* nests.

Photo 12. Rodent droppings and destroyed food caches observed within the barn.

3.2 LA HONDA CREEK PRESERVE – REDWOOD CABIN

SUMMARY

An external survey for Redwood Cabin on Skyline Boulevard, Redwood City, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. An internal and emergence survey was completed on June 26, 2019 by biologists Rachael Burnham and Leslie Rivas. No signs of roosting bats were detected during the internal and external survey of existing structures within. Four dusky-footed woodrat nest structures were observed inside the structure. No bats were observed emerging from the Redwood Cabin during the emergence survey. Acoustic recordings identified fringed myotis (*Myotis thysanodes)* foraging calls in the vicinity.

STRUCTURE

The Redwood Cabin is a one-story structure situated in a redwood forest and is well shaded with only dappled light coming through to the cabin and forest floor (Photo 13 and 14). The log cabin has several rooms, including a kitchen and two bathrooms. On the east side, the deck and portion of the house are supported off the ground by pillars and other support structure.

RESULTS

There are several possible entryways that bats and woodrats could enter the house: open/broken window, chimney, and crevices in the floor and roof. The ample space underneath the house had numerous crevices that could be used by roosting bats. There were also many cracks and crevices that could provide bat roosting habitat under the eaves, between the logs, and inside the cabin. However, no roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed during the survey. In general, moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. Bat tree roost crevice and cavity roost habitat can be found through the Redwood Cabin work area.

Signs of woodrats were present throughout the cabin including a large number of fecal pellets in all rooms of the cabin. One woodrat nest structure was built into a cabinet in the kitchen (Photo 15), twigs around and behind the oven, twigs on ceiling beams in between rooms (Photo 16), and two nest structures built on top of sinks in two rooms (possibly connected behind the wall) (Photo 17 – 18).

EMERGENCE RESULTS

The bat emergence survey at the Redwood Cabin was conducted one hour before sunset and continued until one-half hour after sunset. No bats were observed emerging from the structure. The acoustic recording device set up in front of the cabin identified one species of bats: fringed myotis. During the emergence survey, no bats were detected emerging from the cabin.

DISCUSSION AND RECOMMENDATIONS

The cabin provides suitable bat roost habitat outside and within the cabin with multiple entry points. Moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. While no bats or signs were observed within or outside the cabin during day surveys and no bats were observed emerging during night surveys, a single bat (fringed myotis) was detected with acoustics within proximity of the cabin. Therefore, there is still potential of bat roosting given the available habitat outside and within the cabin. However, this structure receives little light throughout the day and the building is unlikely to warm up sufficiently enough to support a bat maternity roost.

Signs of woodrats were present throughout the structure, however no natural nests were observed outside of the structure. The riparian habitat near the structure provides moderately to highly suitable habitat and may become occupied by woodrats prior to project work.

Recommendations for the Redwood Cabin include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 13. North side of Redwood cabin.

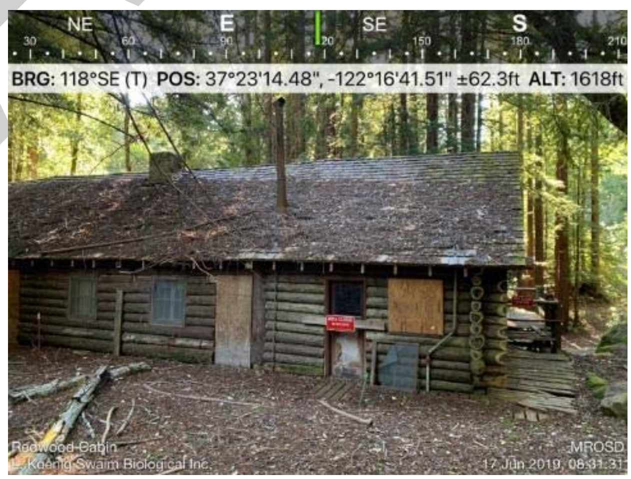


Photo 14. Redwood cabin.

Photo 15. Woodrat nest built into kitchen cabinet of redwood cabin.

Photo 16. Woodrat nest on ceiling beams of redwood cabin.

Photo 17. Woodrat nest on sink in Room A of redwood cabin.

Photo 18. Woodrat nest on sink in a Room B of redwood cabin.

3.3 SIERRA AZUL PRESERVE- MEYER PROPERTY

SUMMARY

An external survey for Meyer Property on Mount Umunhum Road, San Jose, California was conducted on June 11, 2019 by biologists Ben Dudek and Joie de Leon. An internal and emergence survey was completed on June 25, 2019 by biologists Elizabeth Armistead, Ben Dudek, Kathleen Grady, and Leslie Rivas. The biologists conducted a daytime survey at all three structures (labeled A, B, and C) for bat roosts and woodrat nest structures, and a nighttime bat emergence survey. No roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed inside any of the three structures. One *Myotis Sp.* (Photo 27) was observed in a crevice in a nearby shed on June 11th but not on June 25th. Two dusky-footed woodrat nest structures were observed in oak trees Structure A. Two bats were observed emerging from two exit points during the emergence survey from Structure B. Acoustic recordings identified two species of bats foraging within the vicinity: California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*).

STRUCTURES

Structure A is a two-level house that is set to be demolished (Photo 19 and 20). Structure A is well shaded on the north and west sides of the house by oak trees and is unshaded on the east and south sides of the house. Structure B is the one-level studio apartment that will not be demolished (Photo 25). The structure is mostly unshaded with a flat-topped roof. There is a garage with an open-air shed space attached. Structure C is a shed that will also remain and not be demolished (Photo 26). In general, moderately – highly suitable bat maternity habitat is found adjacent to the structures listed above and within the structures scheduled to remain.

Figure 1. Meyer Property Structures

RESULTS

Structure A: The ceiling of Structure A is accessible to bats through a few entry points under the roof eves and the interior is accessible through the chimney (Photo 21). The interior of the house is comprised of a lower level with six sections (kitchen, dining room, laundry room, living room, bedroom, bathroom, and a crawl space) and an upper level with two sections (hallway and bedroom). No visible sign of bat occupancy was observed inside the house. Some nearby oaks had hollows that could provide moderately to highly suitable bat maternity habitat, including a tree with full sun exposure with 20% exfoliating bark.

Two woodrat nests were located approximately 25-feet from Structure A in the hollowed-out trunks of two large coast live oaks (*Quercus agrifolia*) (Photo 22). A black phoebe (*Sayornis nigricans*) nest was observed under the eve of Structure A.

Structure B: A seam running under the roof eaves of Structure B was observed that could provide suitable bat roosting habitat although no roosting bats or signs of roosting bats were observed (Photo 23). Inside Structure B large quantities of woodrat fecal pellets were observed scattered throughout the shed.

Structure C: The open structure has suitable bat maternity and night roosting habitat within (Photo 24). A potential woodrat midden is located outside of the shed on an upper shelf (Photo 25).

Shed: There is a shed to the west of the structures that were to be surveyed where a day roosting *Myotis* sp. was observed on June 11 (Photo 26). No roosting bats were observed on June 25.

EMERGENCE RESULTS

The bat emergence surveys at Structure A and B were conducted one-half hour before sunset and continued until one and a half hours after sunset. No bats were observed emerging from Structure A. However, bats were observed foraging in the oaks about 25-feet north of Structure A. At Structure B, the biologists observed two bats emerge from two points (Table 1) and fly west towards the coast live oak trees. Acoustic surveys positioned over the open space south of Structure B confirmed the presence of California myotis and big brown bat foraging in the vicinity.

Table 1. Bat Emergence Results at Sierra Azul – Meyer Property (Structure B)

Time	No. of Bats Emerging	Location	Latitude	Longitude
2048	1	Structure B - northwest	37° 10' 2.46" N	121° 52' 9.22" W
2053	1	Structure B - southwest	37° 10' 2.24" N	121° 52' 8.87" W

Table 2. Woodrat nest locations – Meyer Property

Location	Latitude	Longitude	Flagging Color
Oak tree near Structure A	37.1670993	-121.8695911	Pink
Oak tree near Structure A	37.1670114	-121.8696032	Pink
Structure C	37.1670462	-121.8690466	Not flagged

DISCUSSION AND RECOMMENDATIONS

Since these some structures are scheduled for removal and others only stabilization (as described above), we present recommendations for each specific structure. All structures are potentially suitable bat day and night roost habitat. Bats were observed foraging in the in the oaks near these structures which serve as moderately to highly suitable maternity roost habitat nearby.

Structure A: The structure provides potential bat entry points to the structure through ventilation holes in the roof eaves and the chimney. The structure provides suitable roosting habitat under the roof eaves and within the structure if access was obtained through any of the current entry points. While no bats or signs were observed within or outside of the structure during day surveys and no bats were observed emerging from the structure during night surveys, absence cannot be assumed.

Two natural woodrat nests were observed outside of the structure in two large coast live oaks although they are likely outside of the disturbance area for demolition activities.

Recommendations for the Meyer Property Structure A include:

- Preconstruction surveys for bats and woodrats prior to demolition activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities.
- General woodrat avoidance measures presented in Section 4.2.

Structure B: The roof eaves of the structure provide suitable bat roosting habitat. While no bats or signs were observed within or outside of the structure during day surveys, two bats were observed emerging from the structure during the night survey. Based on the observed presence of more than one bat emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed within the structure although no natural nests were observed.

Recommendations for the Meyer Property Structure B include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for any habitat removed or disturbed within all structures at the Meyer Property. No additional replacement habitat is recommended unless required by CDFW.

Structure C: While no bats or signs were observed within the shed during day surveys, though potentially suitable bat day and night roost habitat is present.

Signs of woodrats were present in the structure, however no natural nests were observed outside in the vicinity.

Recommendations for the Meyer Property Structure C include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 19. Structure A is partially shaded by oak trees.

Photo 20. Structure A

Photo 21. Ventilation holes under the eve of Structure A.

Photo 22. Woodrat middens in hollows of oak trees west of Structure A.

Photo 23. Structure B – north-side view.

Photo 24. Structure C – shed west of Structure A.

Photo 25. Possible woodrat midden on shelf in Structure C.

Photo 26. *Myotis sp.* (circled in red) observed roosting in crevice in nearby shed to the west of the structure to be removed.

3.4 SIERRA AZUL PRESERVE – BEATTY PROPERTY

SUMMARY

An external survey for Beatty Property off Alma Bridge Road, Los Gatos, California was conducted on June 19, 2019 by Hailey Pexton and Ben Dudek. An internal and emergence survey was completed on June 28, 2019 by biologists Elizabeth Armistead, Rachael Burnham, and Leslie Rivas. The biologists conducted a daytime survey for bat roosts and woodrat nest structures and a night emergence survey. No bats were observed on the June 19 survey. On June 28 six roosting *Myotis sp.* bats were detected during the daytime survey and eight bats were observed emerging from four exit points during the emergence survey. On July 30, District staff completed follow up emergence surveys and observed 11 bats emerging from the structure. Habitat surrounding the structure is highly suitable for maternity bat roost and foraging habitat. Three dusky-footed woodrat nest structures were observed within 50 feet of the existing structure with large amounts of woodrat sign (e.g., fecal pellets) observed throughout the entire house.

STRUCTURE

The structure is a one-story house with crawl space and is situated in oak woodland with nearby grassland and Lexington Reservoir within 500 feet of the property (Photo 27). There was a total of nine rooms in the house, including a kitchen, laundry room, and bathroom. The house is shaded on the north, east, and south sides and has full sun exposure on the west side.

RESULTS

Biologists fully surveyed around the exterior of the house and found multiple potential bat and woodrat entry and exit points on all sides of the house (Photo 27 and 28). Several large oaks surrounding the structure could support roosting bat habitat; two snags on the west side with 5 – 10% exfoliating bark with full sun exposure, one snag of the east side with 5% exfoliating bark with full sun exposure (Photo 29). The house is in disrepair with many decaying eaves around the roofline that bats could be obtaining access through. There is space between many of the boarded-up windows and doors, and some wooden slats of the house are broken that could also provide bat entry points (Photos 30 – 35). There are various holes and broken wooden slats along the bottom of the house that could provide bat or woodrat entry.

There are large amounts of bat signs (e.g., urine staining and guano) on the walls of the interior of the house and all rooms showed signs of bat use (Photo 36). Six bats (*Myotis* sp.) were observed in various places throughout the house.

Upon entry to the house, large amounts of woodrat sign (e.g., fecal pellets) were observed throughout the entire house (Photo 37 and 38). Lots of debris on the floor of the house and two stick piles observed, one on top of the stove in the kitchen and one on top of the sink in the bathroom (Photos 37 - 42). No substantial woodrat nests were observed inside the structure, but there are numerous woodrat access points to the crawl space and area between ceiling and roof that were not surveyed. Three woodrat nests were observed within the 50 feet of the Beatty house structure (Photos 39 – 41).

EMERGENCE RESULTS

The bat emergence survey was conducted one-half hour before sunset and continued until one half hour after sunset. Eight bats were observed exiting the structure (Table 3) at four locations (Photo 34 and 35).

Table 3. Bat Emergence at Sierra Azul – Beatty Property

Time	No. of Bats Emerging	Location	Latitude	Longitude
2032	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2038	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2046	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2047	2	west	37° 11' 26.91" N	121° 59' 8.55" W
2048	1	south	37° 11' 26.84" N	121° 59' 8.45" W

Table 4. Woodrat nest locations Beatty Property

Location (see photos 39-41)	Latitude	Longitude	Flagging Color
South of house – woodrat number 1	37.1906508	-121.9856141	Pink
Down hillside from house – woodrat number 2	37.1909208	-121.9857824	Pink
In tree adjacent to house – woodrat number 3	37.1909558	-121.9858746	Pink

DISCUSSION AND RECOMMENDATIONS

The Beatty Property provides highly suitable bat roosting habitat. Based on the observed presence of bat signs throughout the structure, observed bats roosting within, and bats emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed throughout the structure and natural nests observed outside.

Recommendations for the Beatty Property include:

- Preconstruction surveys for bats and woodrats prior to removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 27. Beatty property.

Photo 28. The housing structure is located beneath a canopy of coast live oaks (photo facing west).

Photo 29. Two snags that could support roosting bats on west side of Beatty structure.

Photo 32. Hole on wall that could provide bat access.

Photo 33. Wooden slats peeling away from the wall.

Photo 34. Bats observed emerging from hole in wall (circled in red) on east side of the house.

Photo 35. Bats observed emerging from wooden slats (circled in red) on west side of the house.

Photo 36. Bat urine staining and guano on wall; *Myotis sp.* (circled in red) observed roosting.

Photo 37. Stick pile on top of stove in kitchen.

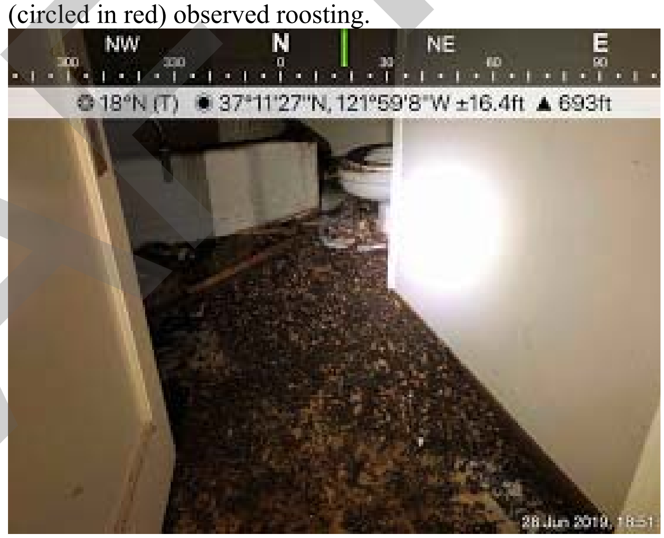


Photo 38. Large amount of woodrat feces on floor.

Photo 39. Woodrat nest number 1 is located under an ornamental bush 9 meters south of the structure
.

Photo 40. Woodrat nest number 2 is located along a fence 10 meters northeast of the structure.

Photo 41. Woodrat nest number 3 is located in a tree, northwest of the structure.

Photo 42. Woodrat A large amount of woodrat feces was observed in one location along the exterior of the structure.

3.5 PURISIMA UPLANDS

SUMMARY

A survey for Purisima Uplands in San Mateo County, California was conducted on June 27, 2019 by biologists Victoria Brunal, Rachael Burnham, Ryan Byrnes, and Ben Dudek. The biologists conducted a daytime survey at all locations for bat roosts and woodrat nest structures, and a nighttime bat emergence survey at Areas B and E. No sign of roosting bats was detected during the daytime survey of existing structures. Fourteen dusky-footed woodrat nest structures were observed inside or near existing structures. Three bats were observed emerging from the roofline of the hunting cabin in Area E during the emergence survey. Acoustic recordings at Area E identified these three individual bats as two species: California myotis and Mexican free-tailed bat (*Tadarida brasiliensis*). No bats were observed during the emergence survey at Area B.

RESULTS

AREA A: The structure at Area A is a small, open, un-shaded shed with a corrugated tin roof. No sign of bats (e.g., guano pellets and urine staining) was observed on the inside of the structure. The exposure of the shed, and lack of small crevices inside the structure may make this building sub-optimal for day roosting bats. Dusky-footed woodrat sign (e.g., pellets) were observed inside the shed. Additionally, five woodrat nest structures were observed throughout the site, including a nest underneath Tank 13 and a second nest in a pipe leading away from the tank.

AREA B: The inside of Tanks 1-2 could not be observed due to their height, but both tanks appeared to be single-walled and open on the top. These tanks are likely unsuitable for day roosting bats due to exposure to the elements and the lack of additional surfaces that could create crevices. The distillation column was capped on the top but appeared to have a small opening on its side about 15 feet off the ground that could potentially be used by roosting bats (Photo 43). The structure on the east side of Area B included a series of iron grates over a concrete box filled with water as well as a dilapidated shed with a corrugated tin roof. The shed contained pieces of wood attached to corrugated tin that created small crevices that could be suitable for bats, but no signs of bats were observed. Large woodrat nest structures were observed inside the series of iron gates and inside the dilapidated shed, as well as behind the shed (Photo 44 and 45).

AREA C: Tanks 3-6 appeared sealed and therefore unlikely to support any bat roosting habitat. The roof on Tank 7 is in the process of falling off the structure. Where the ceiling hung over the tank, there was a small area where bats could find shelter, but no sign of bats was observed. One woodrat nest was observed near Tank 3, and another nest was observed near Tank 6.

AREA D: Tanks 8-12, the area around the concrete pylons, and the various debris piles all were searched. The tanks all appeared to be single-walled without any additional surfaces to create crevices suitable for day-roosting bats. Open tops, or open sides in the cases of tanks lying on their sides, created exposure to

the elements that may preclude these structures from being used by bats (Photo 46**)**. A large woodrat nest was observed inside Tank 11, and two smaller satellite nests were observed surrounding the tank.

AREA E: The exterior of the hunting cabin had rotted and loose wood paneling, especially near the roofline, that could be suitable for roosting bats (Photo 47 and 48). A search of the structure's exterior found no sign of bats, however, many holes and crevices that led to the space between the roof and the structure's interior could not be fully observed. A search of the interior of the structure revealed that the previous owners had used the cabin recently. Maternity colony day-roosting habitat was observed inside the structure and no guano pellets or urine staining were observed. Additionally, no sign of woodrats were observed inside the cabin, however small mammals droppings (likely *Peromyscus* sp.) were present throughout the cabin. One large woodrat nest structure was observed behind the cabin.

EMERGENCE RESULTS

The bat emergence surveys at Areas B and E were conducted one-half hour before sunset and continued until one and half hours after sunset. At Area B, the biologists observed the dilapidated building and an opening on the distillation column. No bats were observed emerging from the small opening on the distillation column, or from the dilapidated structure on the east side of Area B. Additionally no bats were observed flying over the habitat. At Area E, the biologist observed the roofline along the front of the hunting cabin. Three bats were observed emerging from the front of the hunting cabin near the roofline. As the bats were seen flying from the cabin, the acoustic recording device set up in front of the cabin identified two species of bats: California myotis and Mexican free-tailed bat. After emergence, bats were observed flying over the habitat and continued to be recorded by the recording device.

Table 5. Woodrat nest locations Purisma Uplands

Location	Latitude	Longitude	Flagging Color
Area A – woodrat nest 1 wooden shed	37.401899	-122.410356	Pink
Area A – woodrat nest 2 near T13	37.401916	-122.410164	Pink
Area A – woodrat nest 3 near T13	37.401961	-122.410085	Pink
Area A – woodrat nest 4 near T13	37.402006	-122.410073	Pink
Area A – woodrat nest 5 near T13	37.402015	-122.409983	Pink
Area D – woodrat nest 6 near T11	37.402713	-122.409107	Pink
Area D – woodrat nest 7 near T11	37.402723	-122.409152	Pink
Area D – woodrat nest 8 near T11	37.402731	-122.409062	Pink
Area C – woodrat nest 9 near T6	37.402968	-122.407817	Pink
Area C – woodrat nest 10 near T3	37.403112	-122.407635	Pink
Area B – woodrat nest 11 near Storage Shed	37.403192	-122.407431	Pink
Area B – woodrat nest 12 near Storage Shed	37.403155	-122.407364	Pink
Area B – woodrat nest 13 near Storage Shed	37.403191	-122.407363	Pink
Hunting Cabin – woodrat nest 14	37.406049	-122.403736	Pink

DISCUSSION AND RECOMMENDATIONS

None of the tanks to be removed provide suitable bat roost habitat. The structure in Area A provides sub-optimal day roosting habitat and the shed in Area B provides suitable bat roosting habitat in the form of crevices although no bats or signs of bats were observed at either structure. No bats or signs of bats were observed during inspections of the interior of the Hunting Cabin in Area E, however, three bats were observed emerging during night surveys. Based on the observation of bats emerging from the Hunting Cabin this site is presumed to be serving as a maternity roost.

Woodrat signs and nests were observed throughout the property in structures, debris piles and natural nests.

Recommendations for the Purisima Property include:

- Preconstruction surveys for bats and woodrats prior to demolition and debris removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities at the Area E Hunting Cabin.
- Provide replacement bat maternity roost habitat for impacts to removal of maternity roost habitat at Area E Hunting Cabin as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for all bat roost habitat removed or disturbed during removal activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 43. Area B – the distillation column was sealed on top but appeared to have a small opening on the left-hand side near the valve connection.

Photo 44. Area B – woodrat nest structure inside the series of iron grates. This structure sits over a concrete spring box filled with water.

Photo 45. Area B – woodrat nest structure inside the dilapidated building.

Photo 46. Area D – most tanks were single-walled without any small crevice space for roosting bats.

Photo 47. Area E – additional openings and interstitial spaces underneath the roofline.

Photo 48. Area E – openings underneath the roofline of the hunting cabin.

3.6 RANCHO SAN ANTONIO PRESERVE- DEER HOLLOW FARM WHITE BARN

SUMMARY

The survey for White Barn at Deer Hollow Farm in Cupertino, California was conducted on June 18, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures. Though the barn provides potentially suitable bat day and night roost habitat, no roosting bats were observed. Signs (bat guano) of bat roosting were observed in the upper level of the barn. In general, highly suitable bat maternity roost habitat and foraging habitat was observed throughout the site in the form of bat tree roosts and man-made structures. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn that was surveyed is one of many structures in Deer Hollow Farm that is an active educational farm. The lower level of the barn is actively used as a goat milk barn, storage location, and hay barn (Photos 49 and 50). The upper level / former hayloft of the barn is less stable although it too is actively used for storage. The barn receives partial shade from the riparian corridor to the north and a large valley oak to the south. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 51 and 52).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the roof and hayloft doors which are left open. The openings allow for bats to easily enter the building and roost although the openness may reduce the ability for the barn to be used as a maternity roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof.

Bat guano was observed in the interior of the structure on the floor throughout the hayloft (Photo 53). Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat and the adjacent riparian area has plentiful tree roost habitat available.

Rodent sign is present throughout the structure with rodent droppings observed (Photo 54). No woodrat nests were observed on the premises or within the 50-foot buffer. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

DISCUSSION AND RECOMMENDATIONS

While no day roosting bats were observed during the surveys, signs of bats presence (guano) was observed. The site serves a potentially suitable day and night roosting habitat with adjacent suitable bat foraging and tree roost habitat.

No signs of woodrats were present in the structure or surrounding habitat. The active farm nearby likely limits the potential of woodrats to occur within a construction footprint for the barn, however, the nearby riparian habitat provides suitable habitat and therefore woodrat absence should not be assumed.

Recommendations for the Deer Hollow White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 49. White Barn exterior showing hayloft doors and open access points.

Photo 50. White Barn exterior showing hayloft doors and open access points.

Photo 51. White Barn hayloft with crevice roost habitat between roof and rafters.

Photo 52. Interior of hayloft with wooden slat openings

Photo 53. Bat guano on floorboards.

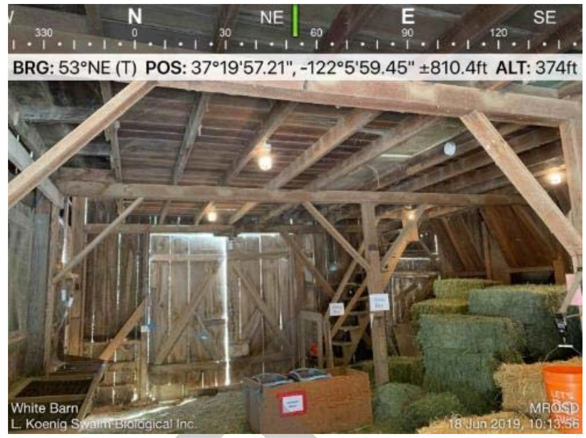


Photo 54. Lower level with hay storage and milk barn

4. RECOMMENDATIONS

Based on the results of these surveys, bats and woodrats are currently using multiple locations within and adjacent to the structures surveyed.

4.1 BATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. At some of these locations suitable bat habitat was observed but no bats were observed during the daytime roost surveys or during emergence. However, bats may switch roosts on a nightly basis, therefore, there is still potential of bats roosting within these structures where suitable habitat is observed. A demolition and deterrent plan for each location that identifies locations for deterrence and what mitigation measures (i.e., replacement habitat) are warranted prior to structure demolition and/or stabilization should be completed as recommended above for each survey location.

The following measures and recommendations for bat deterrence and demolition will be included in the exclusion/deterrent plan. Recommendations should be implemented on a site by site, case by case basis. Not all recommendations are appropriate for all locations, see the Discussion and Recommendations section for each survey location above for reference.

<u>General bat avoidance and minimization measures</u>

- Within two days of the start of work, at all project locations, preconstruction bat roost surveys should be conducted.
- If work is anticipated to occur during the bat wintering period (generally from November 16 through February 15) preconstruction winter roost surveys should be conducted. No building or tree work (over 16" dbh) should be conducted during this time if surveys determine that special status bats or hibernacula are present during winter roost surveys.
- If individual nonbreeding and non-special status bats are present, a qualified biologist may be retained to remove the bats and work may proceed year-round at La Honda Creek Preserve – Redwood Cabin, Sierra Azul Preserve – Meyer Property structures, and the Rancho San Antonio Preserve site. If a maternity roost or special status species bat is observed, no work is allowed without first excluding and providing alternate roost site(s) outside of the breeding season.
- Demolition should be conducted during warmer weather when nighttime lows are not below 50° Fahrenheit, and most bats are likely to be active.
- Recommend that crevices first be demolished with hand tools.
- Initiate demolition in the early evening after sunset with a bat biologist present to capture and temporarily hold any bats that are uncovered.
- If evening work is not feasible, initiate demolition in the early afternoon with a qualified bat biologist present. Early afternoon work will ensure that any remaining roosting bats are not in torpor, as torpid bats may not immediately arouse and escape with disturbance. If any bats are

uncovered, they should be temporarily held and released in the evening.

Bat roost deterrent/exclusion plan

At survey locations with potentially suitable bat roost habitat observed, a site-specific bat roost deterrent plan for is recommended. The following measures below should be considered but may not be applicable to all sites. Alternative roost deterrents may be implemented if approved by qualified biologist. The site-specific deterrent plan shall be submitted to CDFW for approval.

- Deterrents shall be placed outside of April through August maternity season.
- At least seven (7) days before the properties are demolished and/or stabilized, open all windows and doors to increase airflow.
- Deploy ultrasonic acoustic deterrents inside the structures and/or near areas where bats may roost. No acoustic deterrents shall be places next to roosting bats, if bats are observed, deterrents will be placed once bats have left the site.
- Deploy/Install one-way bat doors at locations where bats are observed entering and exiting structures. One-way bat doors and exclusion of bats from the building should occur outside of the April through August maternity season.

Replacement maternity roost habitat

At survey locations with identified maternity roosts, no building demolition or tree work (over 16” dbh) should be conducted April 15 – August 31. Where structures with identified maternity roost habitat will be eliminated, replacement habitat is recommended. CDFW may not require mitigation for these locations, therefore, CDFW should be contacted for guidance for each specific location.

- If CDFW requires replacement habitat, no work should occur without first excluding and providing natural or manmade alternate roost site(s) outside of the breeding season.
- Alternate roost site(s) should be developed by District Natural Resources staff or a consulting biologist and submitted to CDFW before installation.
- Whenever possible alternative roost site(s) should be provided 6 months to 1 year prior to the removal of maternity roosting habitat to allow bats adequate time to discover the new locations.
- Artificial alternative roost site(s) shall be monitored for occupancy by a qualified biologist within one year of installation.

4.2 WOODRATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. A preconstruction survey is warranted at all locations as woodrat houses may become occupied or unoccupied, and new nests constructed prior to project work.

General woodrat avoidance measures

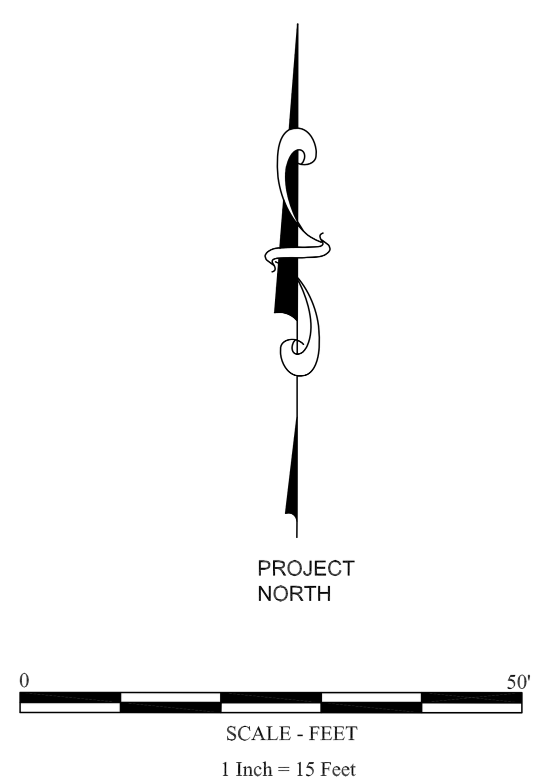
- Conduct focused follow up surveys are at all structures at least five days before construction to confirm the presence of woodrat houses and develop a deterrence/relocation plan if necessary.
- For all woodrat nests that occur in natural habitats (i.e. not within any structure footprint) and cannot be avoided by project activities, a qualified biologist shall live trap to determine if the nest is in use. Trapping activities should occur prior to April and after mid-July each year to prevent impacts to woodrats rearing young or young woodrats. If a nest is found to be unoccupied or not in use for 3 full days (2 nights of trapping), then it may be removed. The nest shall be relocated, or a pile of replacement sticks shall be placed outside of the development footprint for future colonization or re-use.
- In some District locations, woodrats have colonized abandoned buildings, old vehicles, diffuse garbage piles, or other locations where nests are difficult to locate, individuals cannot be live-trapped consistently, and/or there is a lack of woody materials for nest reconstruction. In these instances, live trapping is not required (especially if there is a risk to human health) if the surrounding area provides suitable habitat or supports a healthy colony that is being avoided and/or can be enhanced. Work at these locations must occur prior to April and after mid-July to prevent impacts to woodrats rearing young.
- Once trapped, nests shall be torn down and rebuilt surrounding a log-based structure, an inverted wooden planter, or similar structure having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any cached food and nest material encountered shall be placed within the new structure during rebuilding.
- If individual rats are present, they will be encouraged to leave the area on their own which may include demolition or cleanup in phases, and/or hand removal of materials. If individual woodrats are observed during implementation, work in the immediate area shall cease until the animal leaves the area on its own. Work may continue at other locations away from the observation location. If the animal does not leave the area on its own, the project biologist or a biological monitor shall be notified. Work may proceed at the observation site, once the animal has left the area on its own or a biological monitor is present to ensure that the individual woodrats are not harmed.
- If nests are present that cannot be trapped or removed, woody debris piles that look like woodrat houses can be constructed to provide opportunities for sheltering and colonization by displaced woodrats.
- Relocated nests are expected to eventually be re-colonized and should be monitored one-year post construction using visual surveys and/or wildlife cameras to determine if a relocated nest has returned to use.

EXHIBIT F

Topographic Site Plan

by Sigma Prime Geosciences, Inc.

Attachment 2



Surveyed July, 2019 by Sigma Prime Geosciences, Inc.
This is not a boundary survey
Elevation datum estimated NAVD88 from Google Earth

9/25/2019 12:24:20 PM

19235_La Honda_White Barn_S19C_detached.rvt

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

zfa.com
650.394.8869
copyright © 2019

1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235

Sigma Prime Geosciences, Inc.

SIGMA PRIME GEOSCIENCES, INC.
332 PRINCETON AVENUE
HALF MOON BAY, CA 94019
(650) 728-3590
sigmaprm@gmail.com

PROJECT

DYER BARN

LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

TOPOGRAPHIC SITE PLAN

ENGR: AZG

PM: SRP

DATE: SEPT 30, 2019

SHEET

C1.0

EXHIBIT G

Mothballing Guidelines

by ZFA Structural Engineers

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

Mothballing Guidelines

The focus of mothballing procedures is to stabilize and secure the building:

Stabilization

- Structurally stabilize the building, based on a professional condition assessment.
- Exterminate or control pests, including termites and rodents.
- Protect the exterior from moisture penetration.

Mothballing

- Secure the building and its component features to reduce vandalism or break-ins.
- Provide adequate ventilation to the interior.
- Secure or modify utilities.
- Develop and implement a maintenance and monitoring plan for protection.

Mothballing Checklist

In developing mothballing procedures, the following checklist should be used to ensure that work items are not inadvertently omitted.

Moisture

- Is the roof watertight?
- Do the gutters retain their proper pitch and are they clean?
- Are downspout joints intact?
- Are drains unobstructed?
- Is wood siding in good condition?
- Is site properly graded for water run-off?
- Is vegetation cleared from around the building foundation to avoid trapping moisture?

Pests

- Have nests/pests been removed from the building's interior and eaves?
- Are adequate screens in place to guard against pests?
- Has the building been inspected and treated for termites, carpenter ants, rodents, etc.?
- If toxic droppings from bats, rats and pigeons are present, has a special company been brought in for its disposal?

Housekeeping

- Have the following been removed from the interior: trash, hazardous materials such as inflammable liquids, poisons, and paints and canned goods that could freeze and burst?
- Is the interior broom-clean?
- Have furnishings been removed to a safe location?
- If furnishings are remaining in the building, are they properly protected from dust, pests, ultraviolet light, and other potentially harmful problems?
- Have significant architectural elements that have become detached from the building been labeled and stored in a safe place?
- Is there a building file?

Security

- Have fire and police departments been notified that the building will be mothballed?

- Are smoke and fire detectors in working order?
- Are the exterior doors and windows securely fastened?
- Are plans in place to monitor the building on a regular basis?
- Are the keys to the building in a secure but accessible location?
- Are the grounds being kept from becoming overgrown?

Utilities
- Have utility companies disconnected/shut off or fully inspected water, gas, and electric lines?
- If the building will not remain heated, have water pipes been drained and glycol added?

Ventilation
- Have steps been taken to ensure proper ventilation of the building?
- Have interior doors been left open for ventilation purposes?
- Has the secured building been checked within the last 3 months for interior dampness or excessive humidity?

Maintenance Chart

The following maintenance action items should be considered when developing the maintenance program for the building to be mothballed.

1-3 months; periodic
- Regular drive by surveillance
- Check attic during storms if possible
- Monthly walk arounds
- Check entrances
- Check window coverings for breakage
- Mowing as required
- Check for graffiti or vandalism
- Enter every 3 months to air out
- Check for musty air
- Check for moisture damage
- Check battery packs and monitoring equipment
- Check for evidence of pest intrusion

Every 6 months; spring and fall
- Site clean-up; pruning and trimming
- Gutter and downspout check
- Check crawlspace for pests
- Clean out storm drains

Every 12 months
- Maintenance contract inspections for equipment/utilities
- Check roof for loose or missing shingles
- Termite and pest inspection/treatment
- Exterior materials spot repair and touch up painting
- Remove bird droppings or other stains from exterior
- Maintain building defensible space per Cal Fire standards
- Check and update building file

Reference: Park, Sharon C., 1993. Mothballing Historic Buildings. Preservation Brief No. 31. Department of the Interior, National Park Service. Washington, DC: Government. Printing Office. 15 p. Available online at https://www.nps.gov/tps/how-to-preserve/briefs/31-mothballing.htm

EXHIBIT H

Conceptual Cost Estimate

by OCMI

Attachment 2

Mid-Peninsula Open Space District
Mid-Peninsula Stabilization

La Honda, CA

ZFA Structural Engineers
CONCEPTUAL COST ESTIMATE,R2
OCMI JOB #: 19414.000
18 December 2019

OC INSIGHT

INSIGHT

CONCEPTUAL COST ESTIMATE,R2

COST ESTIMATE

INTRODUCTORY NOTES

This estimate is based on verbal direction from the client and the following items, received 30 September 2019:

General

ZFA Structural Engineers BOD Reports dated October 2019.
Sketches of 11 July 2019 with BOD option notes per Report.
Terracon Hazmat report dated 8-13-19.
Kielty Arborist Services LLC Report dated 9-30-19.
Page & Turnbull Inc. BOD & Alternative Evaluation dated 9-30-19.
ZFA Structural Engineers draft estimate review comments 10-31-19.
Comments and clarifications received through 11 December 2019.

The following items are excluded from this estimate:

- Professional fees.
- Building permits and fees.
- Inspections and tests.
- Furniture, fixtures & equipment, except as noted.
- Installation of owner furnished equipment.
- Construction change order contingency.
- Overtime.
- Items referenced as NOT INCLUDED or NIC in estimate.

The midpoint of construction of January 2021 is based on:

- Construction start date of July 2020
- Estimated construction duration of 12 months

- This estimate is based on a Design-Bid-Build delivery method.
- This estimate is based on prevailing wage labor rates.
- This estimate is based on a detailed measurement of quantities. We have made allowances for items that were not clearly defined in the drawings. The client should verify these allowances.
- This estimate is based on a minimum of four competitive bids and a stable bidding market.
- This estimate should be updated if more definitive information becomes available, or if there is any change in scope.
- We strongly advise the client to review this estimate in detail. If any interpretations in this estimate appear to differ from those intended by the design documents, they should be addressed immediately.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	$/SF AREA
WHITE BARN OPTIONS:			
01. WHITE BARN - OPTION 1	$39,004	1,012	$38.54
01A. OPTION 1 MAINTENANCE COSTS	$144,000		
02. WHITE BARN - OPTION 2	$116,423	1,012	$115.04
02A. OPTION 2 MAINTENANCE COSTS	$288,000		
03. WHITE BARN - OPTION 3	$396,904	1,012	$392.20
03A. OPTION 3 MAINTENANCE COSTS	$288,000		
04. WHITE BARN - OPTION 4	$171,982	1,012	$169.94
REDWOOD CABIN OPTIONS:			
05. REDWOOD LOG CABIN - OPTION 1	$54,250	1,980	$27.40
05A. OPTION 1 MAINTENANCE COSTS	$144,000		
06. REDWOOD LOG CABIN - OPTION 2	$194,501	1,980	$98.23
06A. OPTION 2 MAINTENANCE COSTS	$288,000		
07. REDWOOD LOG CABIN - OPTION 3	$736,793	1,980	$372.12
07A. OPTION 3 MAINTENANCE COSTS	$288,000		
08. REDWOOD LOG CABIN - OPTION 4	$245,869	1,980	$124.18
BEATTY PROPERTY OPTIONS:			
09. BEATTY PROPERTY - OPTION 1	$63,920	1,912	$33.43
09A. OPTION 1 MAINTENANCE COSTS	$144,000		
10. BEATTY PROPERTY - OPTION 2	$208,791	1,912	$109.20
10A. OPTION 2 MAINTENANCE COSTS	$288,000		
11. BEATTY PROPERTY - OPTION 3	$674,313	1,912	$352.67
11A. OPTION 3 MAINTENANCE COSTS	$288,000		
12. BEATTY PROPERTY - OPTION 4	$233,284	1,912	$122.01

1.) The numbers above include mark-ups including escalation to January 2021 at 5% Per Annum. contractor general conditions and insurances.
2.) Design contingency is zero for options 1 and 4. 5% for option 2, and 10% for option 3.
3.) The Owner should add for soft costs and include a separate construction contingency.
4.) Long term maintenance costs have been separated to delineate from capitol costs.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$34,249	$33.84
NET DIRECT BUILDING COST		$34,249	$33.84
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$3,425	$3.38
SUBTOTAL		$37,674	$37.23
INSURANCE	2.00%	$753	$0.74
SUBTOTAL		$38,427	$37.97
BONDS: CONTRACTOR	1.50%	$576	$0.57
TOTAL BUILDING COST		**$39,004**	**$38.54**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$34,249		$33.84
111 Site Preparation	$6,850		$6.77	
112 Site Improvements	$27,399		$27.07	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$34,249**		**$33.84**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)		NIC		
This design idea was not practical due to location				
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$6,850**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	300	LF	67.42	$20,226
Add for barbed wire outrigger	300	LF	7.42	$2,225
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$27,399**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$25,040	$24.74
04 EXTERIOR CLOSURE		$23,320	$23.04
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$49,002	$48.42
NET DIRECT BUILDING COST		$97,362	$96.21
DESIGN CONTINGENCY	5.00%	$4,868	$4.81
SUBTOTAL		$102,230	$101.02
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$10,223	$10.10
SUBTOTAL		$112,453	$111.12
INSURANCE	2.00%	$2,249	$2.22
SUBTOTAL		$114,702	$113.34
BONDS: CONTRACTOR	1.50%	$1,721	$1.70
TOTAL BUILDING COST		**$116,423**	**$115.04**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$25,040		$24.74
031 Floor and Roof Construction	$25,040		$24.74	
032 Stair Construction				
04 EXTERIOR CLOSURE		$23,320		$23.04
041 Exterior Walls	$23,320		$23.04	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$49,002		$48.42
111 Site Preparation	$49,002		$48.42	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$97,362**		**$96.21**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Add pressure treated blocking and shims at deteriorated wood grade beams to prevent further settlement	120	LF	30.00	$3,600
Structure strengthening at walls				
Wall braces inside exterior wall for lateral strengthening				
Treated timber cross braces, 2x10 each side of post				
Cross braces at Grid 1 & 3, 18' average lengths	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
Cross braces at Grid A & F, 18' long	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$25,040**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building, limited				
Close off doors, board up with plywood	240	SF	15.00	$3,600
Fill other miscellaneous openings, windows and gaps	1,012	SF	10.00	$10,120
Rehab windows				
Repair window frames	56	LF	50.00	$2,800
Add / replace sills with stop and bead for new pane	56	LF	45.00	$2,520
Clear lexan view panel	86	SF	40.00	$3,440
Paint and seal window frames	56	LF	15.00	$840
TOTAL - 041 EXTERIOR WALLS				**$23,320**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure				
Shoring and support work, Allowance	1,012	SF	10.00	$10,120
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$49,002**

Maintenance costs:

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$26,117	$25.81
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$83,050	$82.07
04 EXTERIOR CLOSURE		$26,571	$26.26
05 ROOFING		$32,872	$32.48
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$146,258	$144.52
NET DIRECT BUILDING COST		$314,868	$311.13
DESIGN CONTINGENCY	5.00%	$15,743	$15.56
SUBTOTAL		$330,611	$326.69
ESCALATION TO MIDPOINT 01/2021	5.42%	$17,908	$17.70
SUBTOTAL		$348,520	$344.39
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$34,852	$34.44
SUBTOTAL		$383,371	$378.83
INSURANCE	2.00%	$7,667	$7.58
SUBTOTAL		$391,039	$386.40
BONDS: CONTRACTOR	1.50%	$5,866	$5.80
TOTAL BUILDING COST		**$396,904**	**$392.20**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$26,117		$25.81
011 Standard Foundations	$26,117		$25.81	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$83,050		$82.07
031 Floor and Roof Construction	$83,050		$82.07	
032 Stair Construction				
04 EXTERIOR CLOSURE		$26,571		$26.26
041 Exterior Walls	$26,571		$26.26	
042 Exterior Doors/Windows				
05 ROOFING		$32,872		$32.48
051 Roofing	$32,872		$32.48	
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$146,258		$144.52
111 Site Preparation	$98,758		$97.59	
112 Site Improvements	$47,500		$46.94	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$314,868**		**$311.13**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (130 lf)	14	CY	1,520.72	$21,966
Spread/pad footings under posts, 3'x3'x2.5' deep (4ea)	3	CY	1,245.34	$4,151
TOTAL - 011 STANDARD FOUNDATIONS				**$26,117**
ELEMENT - SUBSTRUCTURE				
021 SLAB ON GRADE				
Slab on grade retrofit work				
Note: Alternate option of slab on grade in lieu of replacing sub floor framing assumed not required		NIC		
TOTAL - 021 SLAB ON GRADE				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Replace 8x8 bearers, mount on new footings	120	LF	30.00	$3,600
Replace floor joists, 2x10 joists @ 16" o.c	1,012	SF	17.50	$17,710
Replace floor sheathing, 3/4" plywood	1,012	SF	6.40	$6,477
Anchors, joists and bearers into foundations	18	EA	250.00	$4,500
Roofing replacement work				
Replace rafters tails (2x6 Rafters @ 3' o.c, sloped)	243	SF	30.00	$7,286
Install roof sheathing, 1/2" plywood over skip sheathing	1,214	SF	5.40	$6,558
Repair skip sheathing	1,214	SF	2.50	$3,036
Blocking between rafters at perimeter wall	140	LF	27.50	$3,850
Strengthening structure at walls				
Replace 4x4 knee braces to side bays	8	EA	240.00	$1,920
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall sections)	1,048	SF	15.00	$15,720
Plywood sheathing, 1/2"	1,048	SF	4.60	$4,821
Plywood shear nailing	1,048	SF	1.50	$1,572
HDU's, hold downs bolted to sub structure framing	12	EA	150.00	$1,800
Seismic anchors below wall into foundations	12	EA	350.00	$4,200
Alternate option of steel tension rod bracing from roof to foundations not anticipated		NIC		
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$83,050**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall cladding work				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Selective replacement 10% - 20%, old growth wood siding, vertically run	378	SF	17.50	$6,608
Check battens/ sub structure for status and report				
Paint exterior				
Exterior wood cladding (Paint entire building)	1,248	SF	3.23	$4,025
Premium at barn swing doors	2	EA	500.00	$1,000
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Solid heavy duty panel doors on frame with H.D Hinges				
Single, wide swing	2	EA	3,626.93	$7,254
Locks and associated hardware	2	EA	630.00	$1,260
Wood windows, dual glazed	75	SF	70.65	$5,299
Paint window frames	75	SF	15.00	$1,125
TOTAL - 041 EXTERIOR WALLS				**$26,571**
ELEMENT - ROOFING				
051 ROOFING				
Roof replacement				
Skip sheathing to remain				
Plywood sheathing or underlayment board installed over skip sheathing	1,214	SF	3.21	$3,898
Corrugated metal roofing, steel pitch premium	1,214	SF	21.35	$25,922
(saving of $11,960 to project if metall roofing salvaged)				
Flashings and roof plumbing				
Metal cap ridge flashings	40	LF	31.84	$1,273
Metal edge rake coping	62	LF	28.51	$1,779
TOTAL - 051 ROOFING				**$32,872**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Earthwork				
Excavate existing soil under the building, 24" deep				
Excavate, small machine (Temporary demo access)	82	CY	150.00	$12,369
Machine move dirt to outside building	82	CY	75.00	$6,184
Clean out dirt around posts and structure, by hand	1,012	SF	10.00	$10,120
Site off haul				
Load tracks	99	CY	25.00	$2,474
Haul dirt	99	CY	60.00	$5,937
Dispose dirt	99	CY	30.00	$2,969
Sub floor replacement work				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove 8x8 bearers, mounted on grade	120	LF	10.00	$1,200
Remove floor joists, piecemeal in existing structure	1,012	SF	5.00	$5,060
Remove floor sheathing, piecemeal in existing structure	1,012	SF	1.75	$1,771
Roofing replacement work				
Remove rafter tails, for replacement	243	SF	10.00	$2,429
Skip sheathing to remain				
Roof replacement				
Remove corrugated metal roofing	1,214	SF	2.40	$2,915
Remove flashings and roof plumbing				
Metal cap ridge flashings	40	LF	6.00	$240
Metal edge rake coping	62	LF	5.00	$310
Exterior wall cladding work				
Remove 10% to 20% old growth wood siding, vertically run	250	SF	5.00	$1,248
Check battens/ sub structure for status and report				
Hazmat demolition				
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	10,000.00	$10,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$98,758**

ELEMENT - SITEWORK

112 SITE IMPROVEMENTS

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	27,500.00	$27,500
Planting improvements	1	LS	10,000.00	$10,000
TOTAL - 112 SITE IMPROVEMENTS				**$47,500**

On-going maintenance, 20 year period

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$151,016	$149.23
NET DIRECT BUILDING COST		$151,016	$149.23
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$15,102	$14.92
SUBTOTAL		$166,118	$164.15
INSURANCE	2.00%	$3,322	$3.28
SUBTOTAL		$169,440	$167.43
BONDS: CONTRACTOR	1.50%	$2,542	$2.51
TOTAL BUILDING COST		**$171,982**	**$169.94**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$151,016		$149.23
111 Site Preparation	$151,016		$149.23	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$151,016**		**$149.23**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,012	SF	2.00	$2,024
Remove metal flashings	130	LF	5.00	$650
Remove exterior siding	1,500	SF	5.00	$7,500
Remove barn doors	3	EA	300.00	$900
Remove roof sheathing	1,012	SF	2.00	$2,024
Demolish wood framed structure	1,012	SF	20.00	$20,240
Demolish flooring	1,012	SF	5.00	$5,060
Demolish sub floor framing	1,012	SF	10.00	$10,120
Remove wood				
Load wood debris in trucks	187	CY	20.00	$3,748
Haul wood in trucks	187	CY	40.00	$7,496
Dispose	187	CY	15.00	$2,811
Hazmat demolition				
Hazmat monitoring and clearance	412	SF	5.00	$2,059
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
Biologist monitoring	1	LS	3,000.00	$3,000
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$151,016**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$47,637	$24.06
NET DIRECT BUILDING COST		$47,637	$24.06
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$4,764	$2.41
SUBTOTAL		$52,401	$26.47
INSURANCE	2.00%	$1,048	$0.53
SUBTOTAL		$53,449	$26.99
BONDS: CONTRACTOR	1.50%	$802	$0.40
TOTAL BUILDING COST		**$54,250**	**$27.40**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$47,637		$24.06
111 Site Preparation	$17,245		$8.71	
112 Site Improvements	$30,392		$15.35	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$47,637**		**$24.06**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Approved weed abatement product to perimeter of structure	198	LF	2.50	$495
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$17,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	340	LF	67.42	$22,922
Add for barbed wire outrigger	340	LF	7.42	$2,522
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$30,392**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$42,979	$21.71
04 EXTERIOR CLOSURE		$27,023	$13.65
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$92,655	$46.80
NET DIRECT BUILDING COST		$162,657	$82.15
DESIGN CONTINGENCY	5.00%	$8,133	$4.11
SUBTOTAL		$170,790	$86.26
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$17,079	$8.63
SUBTOTAL		$187,869	$94.88
INSURANCE	2.00%	$3,757	$1.90
SUBTOTAL		$191,626	$96.78
BONDS: CONTRACTOR	1.50%	$2,874	$1.45
TOTAL BUILDING COST		**$194,501**	**$98.23**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$42,979		$21.71
031 Floor and Roof Construction	$42,979		$21.71	
032 Stair Construction				
04 EXTERIOR CLOSURE		$27,023		$13.65
041 Exterior Walls	$27,023		$13.65	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$92,655		$46.80
111 Site Preparation	$87,185		$44.03	
112 Site Improvements				
113 Site Utilities	$5,470		$2.76	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$162,657**		**$82.15**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Foundation support for building				
Cribbing per Corp of Engineers - refer to Site Preparation				
TOTAL - 011 STANDARD FOUNDATIONS				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	22.00	$4,202
Replace porch framing, East side (Allow 50%)				
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$42,979**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off windows, board up with plywood	285	SF	12.50	$3,563
Close off doors, board up with plywood	84	SF	15.00	$1,260
Close off skylights, bpard up with plywood	240	SF	10.00	$2,400
Fill other miscellaneous openings and gaps	1,980	SF	10.00	$19,800
TOTAL - 041 EXTERIOR WALLS				**$27,023**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Pressure treated wood box cribbing, 6x6 members				
West elevation, 6' high, 2 blocks per lvl, 3' long(24 EA)	7	EA	2,160.00	$15,120
Prepare grade and sub floor for cribbing	7	EA	420.00	$2,940
North elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
South elevation, 6' high, 2 blocks per lvl, 3' long(24EA)	3	EA	2,160.00	$6,480
Prepare grade and sub floor for cribbing	3	EA	420.00	$1,260
East elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
East elevation, 12' high, 2 blocks per lvl, 3' long(48 EA)	1	EA	4,320.00	$4,320
Prepare grade and sub floor for cribbing	1	EA	420.00	$420
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	500.00	$500
Removal and disposal of shrubs	1	LS	250.00	$250
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Large tree removal (3 Tan oaks, 2 Madrones) - 5 Total	5	EA	2,500.00	$12,500
Debris removal, grinding	5	EA	1,500.00	$7,500
Remove girdle from Redwood trees, per Arborist report	2	EA	500.00	$1,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
TOTAL - 111 SITE PREPARATION				**$87,185**

ELEMENT - SITEWORK

113 SITE UTILITIES

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Utility disconnections				
Disconnect plumbing and provide cap/valve	1	LS	2,380.00	$2,380
Disconnect power and safe off	1	LS	2,210.00	$2,210
Remove obsolete power board	1	LS	880.00	$880
On-going maintenance, 20 year period - separated out				
TOTAL - 113 SITE UTILITIES				**$5,470**
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$141,497	$71.46
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$165,195	$83.43
04 EXTERIOR CLOSURE		$36,720	$18.55
05 ROOFING			
06 INTERIOR CONSTRUCTION		$10,280	$5.19
07 CONVEYING			
08 MECHANICAL		$86,770	$43.82
09 ELECTRICAL		$44,150	$22.30
10 EQUIPMENT		$15,381	$7.77
11 SITEWORK		$84,512	$42.68
NET DIRECT BUILDING COST		$584,505	$295.20
DESIGN CONTINGENCY	5.00%	$29,225	$14.76
SUBTOTAL		$613,730	$309.96
ESCALATION TO MIDPOINT 01/2021	5.42%	$33,244	$16.79
SUBTOTAL		$646,974	$326.75
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$64,697	$32.68
SUBTOTAL		$711,671	$359.43
INSURANCE	2.00%	$14,233	$7.19
SUBTOTAL		$725,905	$366.62
BONDS: CONTRACTOR	1.50%	$10,889	$5.50
TOTAL BUILDING COST		**$736,793**	**$372.12**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$141,497		$71.46
011 Standard Foundations	$141,497		$71.46	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$165,195		$83.43
031 Floor and Roof Construction	$165,195		$83.43	
032 Stair Construction				
04 EXTERIOR CLOSURE		$36,720		$18.55
041 Exterior Walls	$36,720		$18.55	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION		$10,280		$5.19
061 Partitions				
062 Interior Finishes	$10,280		$5.19	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$86,770		$43.82
081 Plumbing	$83,470		$42.16	
082 H.V.A.C.	$3,300		$1.67	
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$44,150		$22.30
091 Standard Electrical	$44,150		$22.30	
092 Special Electrical				
10 EQUIPMENT		$15,381		$7.77
101 Fixed/Movable Equipment				
102 Furnishings	$15,381		$7.77	
103 Special Construction				
11 SITEWORK		$84,512		$42.68
111 Site Preparation	$24,512		$12.38	
112 Site Improvements	$35,000		$17.68	
113 Site Utilities	$25,000		$12.63	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$584,505**		**$295.20**

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid 1 & 3) Part hand machine dig/ rebar cages	46	CY	1,188.13	$54,707
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid A,B,C,D) Part hand machine dig/ rebar cages	51	CY	1,188.13	$60,621
Spread/pad footings under posts, 3'x3'x3.5' deep, exterior	14.0	CY	983.81	$13,773
Spread/pad footings under posts, 3'x3'x3.5' deep, interior	12.6	CY	983.81	$12,396
TOTAL - 011 STANDARD FOUNDATIONS				**$141,497**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing repairs				
Trim 12" off base of existing timber posts resting on grade	19	EA	340.00	$6,460
Treat seal base of poles	19	EA	320.00	$6,080
Achor base plates with knife plates connected into footing	19	EA	750.00	$14,250
Anchors connecting poles into new footings	19	EA	450.00	$8,550
Floor leveling				
Systematically level floor to correct settlement				
Hydraulic jack at new pad locations - see item below				
Lift/level floor level, hydraulic jack, difficult terrain	990	SF	13.00	$12,870
(Allow 50% floor area)				
Sub floor strengthening				
Add sub floor braces at foundation tie beams				
Treated timber cross braces, 4x10 each side of post				
Cross braces at Grid 1 & 3, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Cross braces at Grid A,B,C,D, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Wall/structure strengthening				
Retrofit 8x8 posts, 8' o.c, inside face of exterior walls	30	EA	432.00	$12,960
Fix posts to logs, simpson 0.22"x15" log screws (x2)	30	EA	495.00	$14,850
(Assume 12 logs per post and 24 fixings)				
Anchor posts, T&B (Roof diaphram & bottom to sub floor)	30	EA	425.00	$12,750
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Repair/replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	12.00	$2,292
Replace porch framing, East side (Allow 50%)				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
Floor system inside building, part replacement 10%				
T&G flooring, 1x6 fixed over Diagnol sheathing	198	SF	25.00	$4,950
Diagnol sheathing, 1x6 fixed over framing	198	SF	10.00	$1,980
Floor joists, 4"x5-1/2" @ 24" o.c	198	SF	9.50	$1,881
floor beams/bearers, 2"x5-1/2" over posts	50	LF	12.50	$625
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$165,195**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall repairs				
Replace lower 3 rows of logs to perimeter walls, install piecemeal so deconstruct is not required, crafting of new logs to match existing geometries and texture	194	LF	64.00	$12,416
Replace additional 4' at ends of corner logs, staggered laps splicing of new to existing logs	256	LF	67.83	$17,364
Allow to re-secure walls/ stacked logs	194	LF	10.00	$1,940
Allow shoring for the work	1	LS	5,000.00	$5,000
TOTAL - 041 EXTERIOR WALLS				**$36,720**
ELEMENT - INTERIOR CONSTRUCTION				
062 INTERIOR FINISHES				
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660
Refinish existing wood flooring				
Finish wood floor with Tung oil	1,900	SF	3.80	$7,220
TOTAL - 062 INTERIOR FINISHES				**$10,280**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - MECHANICAL				
082 H.V.A.C.				
Kitchen renovation				
Replace kitchen flue	1	LS	1,800.00	$1,800
Stove vent, per city no stove		NIC		
Hot water vent	1	LS	1,500.00	$1,500
TOTAL - 082 H.V.A.C.				**$3,300**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to switchboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,980	SF	12.50	$24,750
Conduit and wiring	1,980	SF	5.00	$9,900
TOTAL - 091 STANDARD ELECTRICAL				**$44,150**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	20	LF	374.23	$7,485
Countertop, plastic laminate with backsplash	20	LF	114.50	$2,290
Wall cabinet, plastic laminate	20	LF	280.30	$5,606
TOTAL - 102 FURNISHINGS				**$15,381**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building demolition				
Electrical demolition				
Remove existing Knob & Tube wiring	1,980	SF	1.40	$2,772
Exterior porch				
Remove porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	10.00	$5,590
Remove porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	7.50	$4,193
Remove porch handrailing				
Replace horizontal log rails, 3 high at perimeter	107	LF	9.50	$1,017
Exterior wall repairs				
Remove lower 3 rows of logs to perimeter walls (Per level) piecemeal method so deconstruct not required	194	LF	25.00	$4,850
Replace additional 4' at ends of corner logs, staggered laps	256	LF	15.00	$3,840
Hazmat demolition				
Remove linoleum floor to Kitchen floor glue product (Prior to renovating the cabin floor)	300	SF	7.50	$2,250
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$24,512**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
ADA Improvements, S.W Corner (#10 page 18)				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	20,000.00	$20,000
Planting improvements	1	LS	5,000.00	$5,000
TOTAL - 112 SITE IMPROVEMENTS				**$35,000**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / re-run piping for water and sewer to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$215,896	$109.04
NET DIRECT BUILDING COST		$215,896	$109.04
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$21,590	$10.90
SUBTOTAL		$237,486	$119.94
INSURANCE	2.00%	$4,750	$2.40
SUBTOTAL		$242,235	$122.34
BONDS: CONTRACTOR	1.50%	$3,634	$1.84
TOTAL BUILDING COST		**$245,869**	**$124.18**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$215,896		$109.04
111 Site Preparation	$215,896		$109.04	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$215,896**		**$109.04**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	2,633	SF	2.00	$5,267
Remove doors, single	6	EA	100.00	$600
Remove roof sheathing	2,633	SF	2.00	$5,267
Demolish wood framed structure	1,980	SF	20.00	$39,600
Demolish flooring (Building and Decking)	3,840	SF	2.50	$9,600
Demolish sub floor framing with crawl space (Building and Decking)	3,840	SF	5.00	$19,200
Demolish concrete foundations to building (Minimal)	3,840	SF	2.50	$9,600
Demolish stone and masonry fireplace	720	SF	25.00	$18,000
Demolish concrete foundations to fireplace	1	LS	10,000.00	$10,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Dispose stone and masonry				
Move out of building, hand	27	CY	150.00	$4,000
Load trucks	27	CY	40.00	$1,067
Haul debris	27	CY	50.00	$1,333
Dispose/recycle debris	27	CY	30.00	$800
Dispose concrete (Foundations)				
Load trucks	53	CY	75.00	$3,956
Haul debris	53	CY	50.00	$2,637
Dispose/recycle debris	53	CY	25.00	$1,319
Remove wood				
Load wood debris in trucks	293	CY	15.00	$4,400
Haul wood in trucks	293	CY	30.00	$8,800
Dispose	293	CY	15.00	$4,400
Hazmat demolition				
Hazmat monitoring and clearance	300	SF	5.00	$1,500
Remove linoleum floor to Kitchen floor glue product (Prior to renovating the cabin floor)	300	SF	7.50	$2,250
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$215,896**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$56,128	$29.36
NET DIRECT BUILDING COST		$56,128	$29.36
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$5,613	$2.94
SUBTOTAL		$61,741	$32.29
INSURANCE	2.00%	$1,235	$0.65
SUBTOTAL		$62,976	$32.94
BONDS: CONTRACTOR	1.50%	$945	$0.49
TOTAL BUILDING COST		**$63,920**	**$33.43**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$56,128		$29.36
111 Site Preparation	$21,245		$11.11	
112 Site Improvements	$34,883		$18.24	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$56,128**		**$29.36**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$21,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	400	LF	67.42	$26,968
Add for barbed wire outrigger	400	LF	7.42	$2,967
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$34,883**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$3,500	$1.83
04 EXTERIOR CLOSURE		$41,380	$21.64
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$129,728	$67.85
NET DIRECT BUILDING COST		$174,608	$91.32
DESIGN CONTINGENCY	5.00%	$8,730	$4.57
SUBTOTAL		$183,338	$95.89
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$18,334	$9.59
SUBTOTAL		$201,672	$105.48
INSURANCE	2.00%	$4,033	$2.11
SUBTOTAL		$205,706	$107.59
BONDS: CONTRACTOR	1.50%	$3,086	$1.61
TOTAL BUILDING COST		**$208,791**	**$109.20**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$3,500		$1.83
031 Floor and Roof Construction	$3,500		$1.83	
032 Stair Construction				
04 EXTERIOR CLOSURE		$41,380		$21.64
041 Exterior Walls	$41,380		$21.64	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$129,728		$67.85
111 Site Preparation	$129,728		$67.85	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$174,608**		**$91.32**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Roof repairs				
Repair shed roof along south	1	LS	3,500.00	$3,500
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$3,500**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off doors, board up with plywood	112	SF	15.00	$1,680
Fill other miscellaneous openings and gaps	1,912	SF	2.50	$4,780
Rehab windows				
Repair window frames	80	LF	50.00	$4,000
Add / replace sills with stop and bead for new pane	80	LF	45.00	$3,600
Clear lexan view panel	258	SF	40.00	$10,320
Paint and seal window frames	80	LF	15.00	$1,200
Strengthening at exterior walls				
Wood bracing, 2x10 with screw fixings				
Interior face exterior wall (10 locations)	300	LF	30.00	$9,000
Fix bracing, screw connections (4 points per location)	10	EA	680.00	$6,800
TOTAL - 041 EXTERIOR WALLS				**$41,380**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				
Pressure treated wood box cribbing, 6x6 members				
Exterior, (av) 3' high, 2 blocks per lvl, 3' long(30EA)	25	EA	1,080.00	$27,000
Prepare grade and sub floor for cribbing	25	EA	420.00	$10,500
Interior, (av) 3' high, 2 blocks per lvl, 3' long(20EA)	20	EA	1,080.00	$21,600
Prepare grade and sub floor for cribbing	20	EA	420.00	$8,400
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Hazmat monitoring and clearance	1	LS	5,000.00	$5,000
Remove wallboard for bracing walls, Hazmat	1,000	SF	4.50	$4,500
Collate and dispose material	1,000	SF	1.50	$1,500
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Paint / encapsulation				
Encapsulate and paint the building exterior to match doors	2,256	SF	3.60	$8,122
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$129,728**

Maintenance costs:

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$53,644	$28.06
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$115,711	$60.52
04 EXTERIOR CLOSURE		$78,956	$41.29
05 ROOFING		$24,238	$12.68
06 INTERIOR CONSTRUCTION		$3,060	$1.60
07 CONVEYING			
08 MECHANICAL		$83,470	$43.66
09 ELECTRICAL		$42,960	$22.47
10 EQUIPMENT		$7,690	$4.02
11 SITEWORK		$125,210	$65.49
NET DIRECT BUILDING COST		$534,939	$279.78
DESIGN CONTINGENCY	5.00%	$26,747	$13.99
SUBTOTAL		$561,686	$293.77
ESCALATION TO MIDPOINT 01/2021	5.42%	$30,425	$15.91
SUBTOTAL		$592,111	$309.68
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$59,211	$30.97
SUBTOTAL		$651,322	$340.65
INSURANCE	2.00%	$13,026	$6.81
SUBTOTAL		$664,348	$347.46
BONDS: CONTRACTOR	1.50%	$9,965	$5.21
TOTAL BUILDING COST		**$674,313**	**$352.67**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$53,644		$28.06
011 Standard Foundations	$53,644		$28.06	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$115,711		$60.52
031 Floor and Roof Construction	$115,711		$60.52	
032 Stair Construction				
04 EXTERIOR CLOSURE		$78,956		$41.29
041 Exterior Walls	$78,956		$41.29	
042 Exterior Doors/Windows				
05 ROOFING		$24,238		$12.68
051 Roofing	$24,238		$12.68	
06 INTERIOR CONSTRUCTION		$3,060		$1.60
061 Partitions				
062 Interior Finishes	$3,060		$1.60	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$83,470		$43.66
081 Plumbing	$83,470		$43.66	
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$42,960		$22.47
091 Standard Electrical	$42,960		$22.47	
092 Special Electrical				
10 EQUIPMENT		$7,690		$4.02
101 Fixed/Movable Equipment				
102 Furnishings	$7,690		$4.02	
103 Special Construction				
11 SITEWORK		$125,210		$65.49
111 Site Preparation	$100,210		$52.41	
112 Site Improvements				
113 Site Utilities	$25,000		$13.08	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$534,939**		**$279.78**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (184 LF)	20	CY	1,729.72	$35,363
Interior footing, 1.5' wide x 2' deep, hit and miss (40 LF)	4	CY	1,729.72	$7,688
Spread/pad footings under posts, 2'x2'x2.5' deep (20 EA)	7	CY	1,430.02	$10,593
TOTAL - 011 STANDARD FOUNDATIONS				**$53,644**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing				
Replace crawl space posts, 4x4x N.E 4' high	20	EA	400.00	$8,000
Exterior cripple wall - see Exterior walls				
Flooring				
Replace missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	22.50	$1,125
Steel frame clips to connect joists, girders and posts	20	EA	75.00	$1,500
Retrofit sister 2x8 joists ea side girders (double) @48" o.c	1,008	LF	25.00	$25,188
Premium to pre drill and screw sister joists (or bolt)	1,008	LF	7.50	$7,556
Exterior cripple wall - see Exterior walls				
Strengthening structure at walls				
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall) Allow 100LF	800	SF	15.00	$12,000
Plywood sheathing, 1/2"	800	SF	4.60	$3,680
Plywood shear nailing	800	SF	1.50	$1,200
HDU's, hold downs bolted to sub structure framing	20	EA	150.00	$3,000
Seismic anchors below wall into foundations	20	EA	350.00	$7,000
Roof framing				
Retrofit x2 Ridge beams, span between rafters	117	LF	50.00	$5,850
Connect hardware ends of ridge beams	59	EA	115.00	$6,785
Blocking between rafters, exterior perimeter walls	236	LF	17.50	$4,130
Blocking between rafters, interior walls	153	LF	17.50	$2,678
Retrofit collar ties to supplement existing	59	EA	77.50	$4,534
Roofing replacement work				
Replace part rafters, 2x8 Rafters@ 2'o.c (Allowance, 20%)	402	SF	29.50	$11,847
New roof sheathing, 5/8", pitched roof	2,008	SF	4.80	$9,638
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$115,711**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior walls				
Cripple wall retrofit work				
Stud framing, 2x4 @16" o.c (Cripple wall)	582	SF	15.00	$8,730

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Plywood sheathing, 1/2"	582	SF	4.60	$2,677
Sill/ bearer, 3x4 bolted to foundations, 24" o.c	200	LF	62.50	$12,500
New wood siding, 1x12 to match historical planks, cripple wall				
North elevation, N.E 3.5' high	224	SF	22.50	$5,040
East & West Elevation, N.E 2.5' high	230	SF	22.50	$5,175
South Elevation, N.E 2' high	128	SF	22.50	$2,880
HDU's, hold downs bolted to bearer, 4' o.c	50	EA	125.00	$6,250
Exterior wall cladding work				
Replace siding,1x12 salvaged old-growth redwood, Allowance	150	SF	35.00	$5,250
Check battens/ sub structure for status and report				
Rehab windows				
Repair window frames	138	LF	50.00	$6,900
Add / replace sills with stop and bead for new pane	138	LF	45.00	$6,210
Replace glass to windows	146	SF	30.00	$4,380
Paint and seal window frames	138	LF	15.00	$2,070
Rehab doors, restore to working condition with repair and paint				
Exterior	4	EA	750.00	$3,000
Interior, rooms	4	EA	400.00	$1,600
Interior, cupboards	2	EA	250.00	$500
Paint exterior				
Exterior wood cladding, prepare and paint	2,448	SF	2.37	$5,794
TOTAL - 041 EXTERIOR WALLS				**$78,956**
ELEMENT - ROOFING				
051 ROOFING				
Roof Replacement				
Asphalt shingles (standard strip shingles)	1,912	SF	4.87	$9,317
Adhered membrane	1,912	SF	1.72	$3,282
Rigid insulation, 2"	1,912	SF	2.77	$5,295
Flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	6.39	$747
Asphalt shingle valley flashing	25	LF	5.88	$147
Metal eave edge flashing	147	LF	23.47	$3,450
Raked metal roof end flashing	85	LF	23.47	$2,000
TOTAL - 051 ROOFING				**$24,238**
ELEMENT - INTERIOR CONSTRUCTION				
062 INTERIOR FINISHES				
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 062 INTERIOR FINISHES				**$3,060**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to swicthboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,912	SF	12.50	$23,900
Conduit and wiring	1,912	SF	5.00	$9,560

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 091 STANDARD ELECTRICAL				**$42,960**
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	10	LF	374.23	$3,742
Countertop, plastic laminate with backsplash	10	LF	114.50	$1,145
Wall cabinet, plastic laminate	10	LF	280.30	$2,803
TOTAL - 102 FURNISHINGS				**$7,690**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Demolition, piecemeal at building				
Remove roof shingles	1,912	SF	2.60	$4,971
Remove roof underlayment	1,912	SF	1.20	$2,294
Remove wood siding to replace, Allowance 150 sf	150	SF	5.00	$750
Remove flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	4.00	$468
Asphalt shingle valley flashing	25	LF	4.00	$100
Metal eave edge flashing	147	LF	6.00	$882
Raked metal roof end flashing	85	LF	6.50	$554
Sub floor framing repairs				
Remove crawl space posts, N.E 4' high	20	EA	390.00	$7,800
Remove sub floor exterior wall paneling	582	SF	12.50	$7,275
Flooring				
Remove missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	10.00	$500
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Roofing replacement work				
Remove damaged rafters, 2x8 Rafters @ 2' o.c, sloped (Allowance,	402	SF	12.50	$5,020
Remove roof sheathing, 5/8", pitched roof	2,008	SF	2.40	$4,819
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Hazmat monioring and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	1.50	$5,550
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$100,210**
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / correct piping into site to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$204,845	$107.14
NET DIRECT BUILDING COST		$204,845	$107.14
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$20,485	$10.71
SUBTOTAL		$225,330	$117.85
INSURANCE	2.00%	$4,507	$2.36
SUBTOTAL		$229,836	$120.21
BONDS: CONTRACTOR	1.50%	$3,448	$1.80
TOTAL BUILDING COST		**$233,284**	**$122.01**

GROSS FLOOR AREA: 1,912 SF

Attachment 2

Mid-Peninsula Stabilization

BEATTY PROPERTY - OPTION 4

La Honda, CA

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$204,845		$107.14
111 Site Preparation	$204,845		$107.14	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$204,845**		**$107.14**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,912	SF	2.00	$3,824
Remove metal flashings	232	LF	5.00	$1,160
Remove exterior siding	2,472	SF	5.00	$12,360
Remove doors, single	12	EA	100.00	$1,200
Remove roof sheathing	1,912	SF	2.00	$3,824
Demolish wood framed structure	1,912	SF	15.00	$28,680
Demolish flooring	1,912	SF	2.00	$3,824
Demolish sub floor framing	1,912	SF	3.50	$6,692
Remove dead tree	2	EA	2,000.00	$4,000
Remove large trees hanging over property	2	EA	2,000.00	$4,000
Recycle wood				
Load wood debris in trucks	212	CY	25.00	$5,311
Haul wood in trucks	212	CY	50.00	$10,622
Dispose/recycle wood	212	CY	35.00	$7,436
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Consultant monitoring, inspections and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	0.75	$2,775
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	15,000.00	$15,000
TOTAL - 111 SITE PREPARATION				**$204,845**

ZFA STRUCTURAL ENGINEERS

BEATTY PROPERTY HOME

Structure Stabilization Basis of Design

Midpeninsula Regional Open Space District
Sierra Azul Preserve, Santa Clara, California
District Project Number: MAA22-004

March 13, 2020

Prepared For:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

Prepared By:

Steven Patton, SE, Senior Associate
Matt Frantz, SE, Associate Principal
Mark Moore, SE, Principal-in-Charge

TABLE OF CONTENTS

EXHIBITS

Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
Exhibit C: *Geotechnical Investigation* by Romig Engineers
Exhibit D: *Asbestos and Lead Survey* by Terracon Consultants, Inc.
Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
Exhibit F: *Topographic Site Plan* by Sandis
Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
Exhibit H: *Arborist Report* by Kielty Arborist Services LLC
Exhibit I: *Conceptual Cost Estimate* by OCMI

BASIS OF DESIGN SUMMARY

Introduction

The Beatty Property Home is located on a 55-acre site just east of Lexington Reservoir in the Sierra Azul Preserve and is owned by Midpeninsula Regional Open Space District (District). The property can easily be accessed from Alma Bridge Road at the District gate. The Beatty Property Home is a wood-framed residential building originally constructed between 1866 and 1877. The home is currently unoccupied, with all of the doors and windows boarded up.

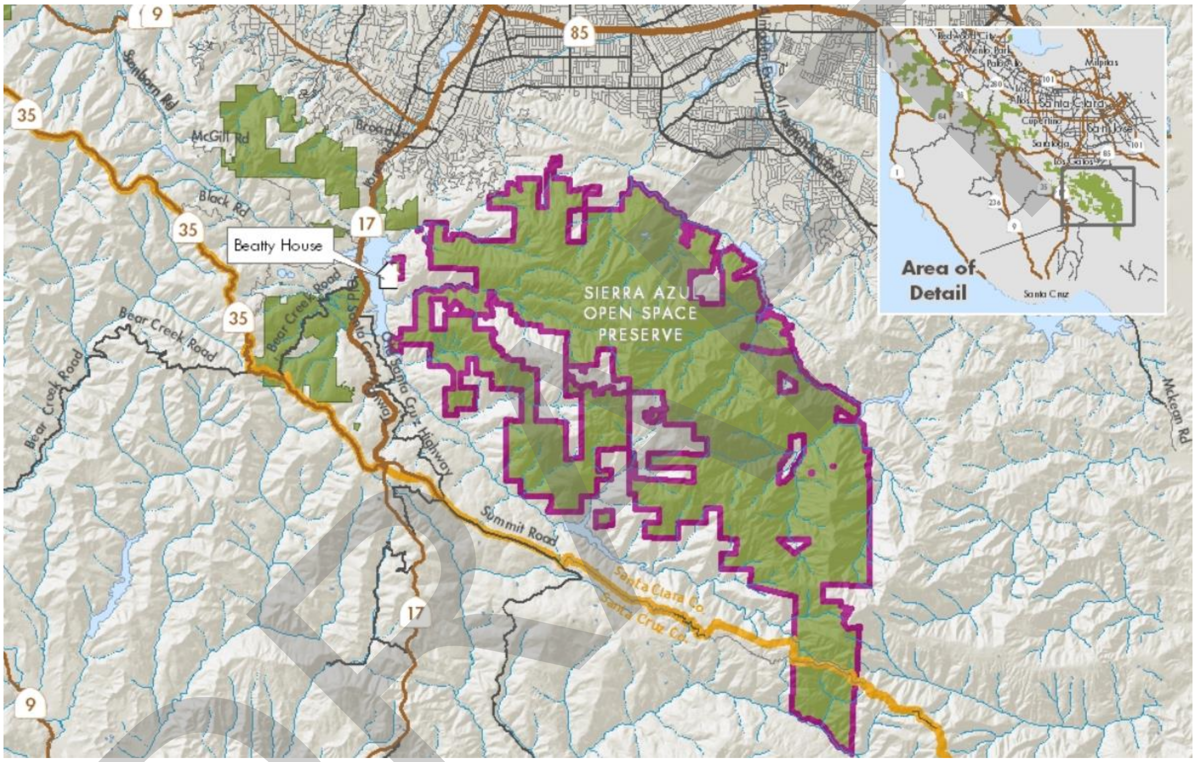


Figure 1. Project Area Map

The exterior of the structure is covered by a combination of horizontal siding and vertical siding with battens. The primary structure is wood rafters with collar ties supported by wood bearings walls and posts supported at grade. The gable roof is comprised of 1x horizontal lumber decking supporting asphalt shingle roofing. The building is eligible for individual inclusion in the California Register of Historic Places and qualifies as a historical resource. The lack of use and years of deferred maintenance have left the Beatty Property Home in poor condition.

The District has initiated a project to assess the Beatty Property Home, along with the La Honda Creek Redwood Cabin and White Barn. The project is being performed in two phases:

- Phase 1: Site reconnaissance and structure assessment
- Phase 2: Improvement selection and construction documents

This report summarizes the findings and recommendations from the Phase 1 tasks including an assessment of the existing conditions, Basis of Design, conceptual design alternatives, and cost estimates. The proposed alternatives include:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a limited use retreat space.
4. **Remove the structure** and restore the underlying natural resource values.

Each alternative can include interpretive signage if or once the site is accessible to the public.

Consultants and Exhibits

The findings and recommendations contained in this summary are based on the following reports, which are provided as Exhibits:

- Exhibit A: *Architectural Basis of Design and Alternative Evaluations* by Page & Turnbull, Inc.
- Exhibit B: *Structural Condition Assessment and Basis of Design* by ZFA Structural Engineers
- Exhibit C: *Geotechnical Investigation* by Romig Engineers
- Exhibit D: *Asbestos & Lead Survey* by Terracon Consultants, Inc.
- Exhibit E: *Structural Surveys for Special-Status Mammal Species* by Swaim Biological, Incorporated
- Exhibit F: *Topographic Site Plan* by Sandis
- Exhibit G: *Mothballing Guidelines* by ZFA Structural Engineers
- Exhibit H: *Arborist Report* by Kielty Arborist Services LLC
- Exhibit I: *Conceptual Cost Estimate* by OCMI

Permitting Agency

The permitting agency for this building is the County of Santa Clara Department of Planning and Development (County). A preliminary coordination meeting was performed with the County to discuss the project. The County requested that a follow-up meeting be held once an option is selected by the District. In addition, the County of Santa Clara Historic Resource Planner stated that the proposed option must be reviewed and approved by the County's Historic Resources Advisory Board (HRAB). The County did not provide definitive guidance on the permitting schedule as this is dependent on the selected option, but the permitting and review schedule is expected to increase along with the scope of rehabilitation. For instance, the County stated that installation of a fence could likely be approved with an over-the-counter review, whereas rehabilitation for occupancy of the interior of the building would require a formal submittal review process. Demolition of the building or any significant alterations to the historic fabric would require greater review time by the HRAB.

Regulatory Requirements

The following regulatory contexts, summarized here from Exhibit A, were investigated and considered for this building:

- National Register of Historic Places
    - The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. The Beatty Property Home is not currently listed in the National Register and has not been evaluated for eligibility.
- California Register of Historic Resources
    - The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Based on a

previous assessment, the Beatty Property Home was determined to be eligible for the California Register.

- Secretary of The Interior's Standards
  - *The Secretary of the Interior's Standards for the Treatment of Historic Properties* (*Standards*) establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The *Standards* and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources.

Governing Building Code

Since the building is eligible for the California Register, the *California Historical Building Code* (Part 8 of the California Code of Regulations, Title 24) is the governing building code. As discussed in Exhibit A, the code provides performance-oriented rather than prescriptive provisions for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources. The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all.

Architectural Condition Assessment

The results of the architectural conditions assessment, detailed in Exhibit A, is summarized below.

Windows

All windows are boarded up with plywood on the exterior leaving part of the framing visible from the outside. Visually they appear to be in fair condition, in need only of replacement of broken glass and painting of the wooden parts, though verification should be made to the operable parts of each to assess the need or lack thereof for more extensive work.

Exterior Doors

All doors are boarded up with plywood on the exterior leaving part of the framing visible from the outside. Visible portions of doors appear to be in good condition though some glass pieces are missing.

Exterior Wood Cladding

The exterior wood cladding is composed of a vertical board and batten system trimmed at the top and bottom by horizontal boards, with a second layer of horizontal cladding on portions of the south and west façade. The trim is missing in some sections. The cladding is generally in fair to poor condition, showing evident signs of water damage, weathering deterioration and wood decoloring. Sections of cladding that are partially protected by surrounding trees are in good to fair condition.

Foundations

The foundations for the building were not accessible making their conditions unknown, although the general levelness of the floors and plumbness of the walls indicates no significant failure of the foundations.

Porch

The current porch is in poor shape, and the westernmost section is partially collapsed.

Roof Cladding

The original roof cladding has been substituted by asphalt shingles. It appears to be in good condition on the exterior, although there are signs of humidity and possible water infiltration where the roof structure and slopes from the different building sections join.

Floors

The original floors appear to be fir planks covered by resilient carpet over patterned tar paper, and a more modern resilient flooring in the bathroom and kitchen and pantry. The parlor and the corridor are carpeted. Visible areas of the base wood are in fair condition, showing some general darkening where not covered by the floor finishes, and requiring some maintenance. Several floor boards are missing in the storage room.

Interior Partitions

The only original partition clearly visible is the one separating the dining room from the parlor, and is in good condition where visible. Other partitions are in good condition in the visible areas. Most walls have an interior finish of cardboard drywall making unknown the exact current conditions of the underlying walls, though they appear to be in sound conditions. More extensive investigation is recommended to verify conditions or need of any treatments. Beneath the cardboard drywall there are traces of decorative paintings or painted paper in the living room walls, which would require more extensive research to determine its condition and historic value.

Roof Framing

The roof framing is mostly concealed making its condition generally unknown. The visible sections of roof framing through openings in the ceiling show high levels of decoloring, humidity and rot of the original sheathing, and of parts of the framing structure. Further evaluation is recommended prior to choosing treatment. It is also necessary to consider that these ceiling openings serve as exit points for several bats that apparently have their nesting grounds between the roof and ceiling of the house, which should be addressed prior to any work.

Structural Condition Assessment

The results of the structural condition assessment are detailed in the report in Exhibit B. The structural assessment includes a review of the existing materials conditions as well as the expected performance of the structure under seismic and gravity loading.

Overview

The structure appears to be in generally poor to fair structural condition with obvious structural damage and deterioration apparent.

Roof Framing

The roofing is composed of asphalt shingles supported directly on 1x horizontal lumber decking and 1x framing that spans between the roof rafters. The roof rafters are spaced approximately 36” on center and clear span from the ridge to the exterior walls. 1x6 collar ties span between the rafters below the ridge to help resist horizontal thrust and allows the rafters to span between exterior bearing walls. There does not appear to be a ridge beam or ridge board.

Walls

Walls above the ground floor are typically framed with horizontal 1x siding on the exterior, and vertical 1x to 2x siding on the interior face. The original interior partition is framed with 1x wood siding as well. Wood siding is missing in some locations, creating openings in the walls allowing water and pests to enter the building. The crawlspace walls are framed with 3x posts spaced at approximately 4 feet on center, with exterior horizontal or vertical siding. The posts and siding are in ground contact along the bottom edge.

Floor Framing

At the ground floor level, the flooring is composed of 1x horizontal wood planking spanning between 2x floor joists spaced at approximately 16" on center. The floor joists span between 3x flat girders that are supported by 3x wood posts. The wood posts are either supported directly on grade or sit on a flat wood sleeper that is directly on grade. No blocking, hardware or positive connections were observed between the joists, girders and posts. The observable portions of the floor framing appeared in fair condition, except for the moisture damaged framing in contact with the ground.

Foundations

The foundations for this structure are limited to wood posts that bear either directly on grade, or on a small wood sleeper on grade. Some posts may be embedded an unknown distance into the ground. Moisture damage was observed at several posts in contact with the ground.

Seismic Force-Resisting System

The lateral system of the building is not a "codified" system identified under the current building code but has been defined as light-framed (wood) walls rated for shear resistance for the purposes of this assessment. The horizontal lumber roof diaphragm transmits roof horizontal loads to the wood siding walls below. Perimeter walls and one interior wall are present as lateral force-resisting elements. Some diagonal wood bracing is also present within the crawlspace cripple walls to help resist lateral loads.

Geotechnical Investigation

A geotechnical investigation report has been prepared by Romig Engineers, which is in Exhibit C. Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 6).

The bottom of all footing excavations should be cleaned of loose or soft soil and/or disturbed bedrock or debris. The bottom of all footing excavations should be cleaned of loose, soft, overly moist or collapsible soil and debris. A member of the geotechnical engineer's staff should observe the excavations to confirm that they have at least the minimum recommended dimensions, are founded in competent residual soil or bedrock, and have been properly cleaned prior to placing concrete forms and reinforcing steel. If existing fill soil, colluvial soil, or disturbed bedrock is encountered at the foundation bearing depth, the geotechnical field representative will require these materials to be removed and a deeper embedment depth provided before reinforcing steel and concrete is placed.

Hazardous Materials Survey

An Asbestos and Lead Survey was performed by Terracon, which is documented in the report in Exhibit D. In summary, asbestos containing materials and lead containing paint were identified in the tested materials. All removal of Asbestos-Containing Materials including non-friable materials left in the building must be conducted by a licensed and registered asbestos abatement contractor in accordance with 8CCR1529 and the BAAQMD Regulation 11 Rule 2. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule.

Archaeological Survey

An archaeological survey is not required for all Alternatives and was therefore not included in this Assessment. An archaeological survey would only be performed for Alternatives 3 and 4. Should these alternatives be selected, the survey would be performed concurrent with the documentation for that phase.

Arborist Report

Based on the Arborist investigation performed by Kielty Arborist Services, which is in Exhibit H, one Redwood tree, approximately 12 feet from the northeast corner of the building, and one Laurel tree, approximately 28 feet from the northwest corner of the building, are in poor condition and removal is recommended for both. Tree irrigation is not recommended for the existing Oak trees, and a Tree Protection Plan is outlined.

Wildlife Survey

A wildlife survey was performed by Swaim Biological, Incorporated, on June 19 and June 28, 2019, which is in Exhibit E, to identify special status mammal species in and around the building. The structure provides highly suitable bat roosting habitat. Based on the observed presence of bat signs throughout the structure, observed bats roosting within, and bats emerging from the structure this site is presumed to be serving as a maternity roost. Woodrat signs were observed throughout the structure and natural nests observed outside.

Recommendations to address the presence of wildlife include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1 of SBI's report. The bat wintering period is generally from November 16 through February 15, no building or tree work should be conducted during this time if bats are present.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW.
- Follow general woodrat avoidance measures presented in Section 4.2 of SBI's report.
- Nesting bird surveys are required if work takes place between February 15 and August 30.

Site Access Constraints

The following items were considered when developing cost estimates for BOD alternatives and should be considered for future planning of repairs and maintenance for the Beatty Property Home:

- Wildlife Habitat – The presence of protected species in the area requires that personnel and visitors to the site follow District guidelines and advisory documents for access. District access permits are required for this site. Bird nesting season is February 15 to August 30. Bat maternity season is from April 15 to August 31. Torpor season is from November 15 to February 15. Construction restrictions will be in effect for these times. A biological monitor is required to be present during the first phases of construction or demolition to ensure bats are not harmed. Exclusion may also be warranted depending on the type of work taking place.

Design Alternatives

Based on the current observable condition of the structure, the building's structural integrity is compromised, and multiple safety hazards are present. Access to the building and its proximity should be limited to District staff and consultants only until one of the following options is implemented.

Four alternatives are explored to address the existing condition of the structure, which range from minimal work with restricted public access to a complete rehabilitation to allow for re-occupancy. Demolition is also explored as an option. Cost estimates have been developed for each alternative to assist the District with decision making.

Alternative 1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

Recommendations:

- Install a secure chain-link fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Along the north side of the building, the fence will likely be required to be closer to the building (approximately 10 feet away) due to the steep slope conditions. Several trees will be within the fence perimeter and will require coordination with the *Tree Protection Plan* during installation. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.
- Remove one Redwood tree and one Laurel tree that are in poor condition. Prune the Oak trees as outlined in the *Tree Protection Plan* included in the *Arborist Report* by Kielty Arborist Services (see Exhibit H).
- Additional factors may need to be considered regarding the recommended lifespan of this alternative.

The estimated cost for Alternative 1 is **$63,920**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

The recommended stabilization methods specifically target only the gravity related structural deficiencies and would not allow for re-occupancy of the building. The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented.

Recommendations:

- Install pressure treated wood cribbing or shims to shore all post and bearing wall locations around perimeter that have observable moisture damage or are no longer in contact with the grade below. Stabilization shoring installed in a minimum 2x pattern per Corp of Engineers (or equivalent) is recommended for the cribbing shores.
- All failed or failing portions of the existing shed roof along the south should be repaired, replaced in-kind or demolished entirely where permissible to minimize area required to be maintained by the District.
- The dilapidated shed at the northeast corner, which appears to not be part of the original construction, should be dismantled and removed.
- Diagonal 2x8 wood bracing with screwed connections should be installed on the interior face of the exterior walls and at cripple walls directly below (assume 10 linear feet along each exterior wall – 100 linear feet total).
- Under this option, if it is not desirable for the perimeter access to the site to be fenced in per Alternative 1, it is recommended that all 17 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.
- Remove peeling, loose lead-containing paint from the exterior. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to match the original color.
- Areas and/or elements of the building envelope that are deteriorated beyond repair should be replaced in-kind to match the original elements and construction techniques. Character-defining features such as the board-and batten siding, wood windows, and wood doors in particular should be repaired so that the building can best convey its historic form and significance.
- Follow the *Mothballing Guidelines* outlined in Exhibit G, including:

a. Secure the building and its component features to reduce vandalism or break-ins.
b. Remove furnishings, trash and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
c. Provide adequate ventilation to the interior.
d. Secure or modify utilities and mechanical systems.
e. Develop and implement a maintenance and monitoring plan for protection, including

- Remove one Redwood tree and one Laurel tree that are in poor condition. Prune the Oak trees as outlined in the *Tree Protection Plan* included in the *Arborist Report* by Kielty Arborist Services (see Exhibit H).
- Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Alternative 2 is **$208,791**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 3: Repair and rehabilitate the structure for reuse as a limited use retreat space. The California Historic Building Code (CHBC) would be utilized to define the design criteria.

Recommendations:

- While the Beatty Property Home is currently unoccupied, the Basis of Design assumes that the current occupancy is classified as Residential. The maximum occupancy of the structure was not investigated but assumed to be (5) based on the number of bedrooms. If the building was to be repurposed for use as District staff housing, the requirements would essentially be the same as for a retreat, meeting space, or hiker’s shelter.
- Provide new structural members including:
  - New concrete foundation: perimeter strip footing, interior strip footing, interior spread footings
  - Crawlspace framing: replace existing interior posts, install perimeter cripple wall studs and plywood wall sheathing.
  - Roof framing: replace existing planking with plywood sheathing, install new ridge boards and blocking, reinforce existing collar ties, replace failed members in kind, install new roofing.
  - Wall framing: install plywood wall sheathing on interior at portions of perimeter wall, install new perimeter stud wall framing at portions of perimeter wall, install holdowns at new plywood wall segment ends
  - Floor framing: replace missing or damage floor planking, install framing hardware, reinforce existing floor girders
- Secretary of the Interior’s *Standards* are the most appropriate basis for this proposed project alternative.
- Dismantle and remove the dilapidated shed at the northeast corner, which appears to not be part of the original construction.
- Remove the asbestos-containing material and lead-containing paint in accordance with provisions specified in the Asbestos and Lead Survey (Exhibit D).
- In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Alternative 2, the following work should be anticipated for cost estimation purposes:
  - Upgrade and reconnect plumbing and electrical service.

- Construct a new septic and potable water system. A well was observed approximately 200 feet southeast of the building but was not investigated and consumption safety is uncertain. The well will require testing to determine continued use.
- Install new flooring and toilet, lavatory, and shower/bath in the bathroom.
- Assuming a functional kitchen is desired for the new uses, install new cabinetry, a new sink and fixtures, and a new oven and stove.

- Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.
- A formal accessibility review was not part of the scope of this investigation; however, the following items were not compliant with the Building Code and should thoughtfully be designed for to not compromise the character-defining features of the building:
    - None of the existing doors are level with exterior grade
    - Clear space at building doors is less than the 29-1/2” allowed by Code
    - There are multiple level changes of at least one step inside the building
- Remove one Redwood tree and one Laurel tree that are in poor condition. Prune the Oak trees as outlined in the *Tree Protection Plan* included in the *Arborist Report* by Kielty Arborist Services (see Exhibit H).
- Remove wildlife waste products.
- Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).
- Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

The estimated cost for Alternative 3 is **$674,313**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I. Additional maintenance costs are included as a separate line item in the cost estimate report.

Alternative 4: Remove the structure and restore the underlying natural resource values.

Recommendations:

- Demolishing the structure may require additional processes to obtain demolition permits.
- Removal of all hazardous materials prior to demolition of the building (See Exhibit D).
- The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.
- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

The estimated cost for Alternative 4 is **$233,284**. This cost estimate includes markup and contingencies as noted in detail in the cost estimate report contained in Exhibit I.

EXHIBIT A

Architectural Basis of Design and Alternative Evaluations

By Page & Turnbull, Inc.

TABLE OF CONTENTS

INTRODUCTION

The purpose of this section of the Basis of Design report is to evaluate the existing architectural conditions and the potential impacts and implications of the Beatty Property Home in the Sierra Azul Open Space Preserve within the Midpeninsula Regional Open Space District. The four proposed project alternatives/treatments are generally stated as follows:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a limited use retreat space.
4. **Remove the structure** and restore the underlying natural resource values.

METHODOLOGY

To evaluate the existing conditions of the three subject buildings, Page & Turnbull conducted visual conditions assessments and documented the existing conditions with digital photography. The conditions were evaluated based on the following rating system of good, fair, and poor conditions:

Good (G)
The building element / feature is intact, structurally sound, and performing its intended purpose. The element / feature needs no repair or rehabilitation, but only routine or preventative maintenance.

Fair (F)
The building element / feature shows signs of aging and one or more of the following conditions is present:

a) There are early signs of wear, failure, or deterioration though the element / feature and its components are generally structurally sound and performing their intended purpose; or

b) There is failure of one individual component.

Poor (P)
The building element / feature shows signs of deterioration and one or more the following conditions is present:

a) The element / feature is no longer performing its intended purpose; or
b) Feature is missing; or
c) Deterioration or damage affects more than 30% of the element / feature; or
d) The element / feature shows signs of imminent failure or breakdown.

Unknown (U)
The element / feature was not accessible for assessment or not enough information is available to make an evaluation.

Evaluation of the proposed project alternatives took into account the historic significance of the Beatty Property Home, and the applicable preservation principles and context, including the Secretary of the Interior's Standards for the Treatment of Historic Properties, , the 2016 California Building Code, the 2016 California Existing Building Code, and the 2016 California Historical Building Code.

Evaluation of the structural conditions and recommendations for the remediation of structural deficiencies was performed by ZFA. Refer to the assessment report and treatment recommendations produced by ZFA for all structural considerations and impacts.

GUIDING PRESERVATION PRINCIPLES AND CONTEXT

The following section describes the preservation principles and context that are applicable to the Beatty Property Home. For analysis and considerations related to the California Environmental Quality Act (CEQA) as it may apply to the proposed project alternatives, additional studies may need to be performed.

THE NATIONAL REGISTER OF HISTORIC PLACES

The National Register of Historic Places is the nation's most comprehensive inventory of historic resources. The National Register is administered by the National Park Service and includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, or cultural significance at the national, state, or local level. Typically, resources over fifty years of age are eligible for listing in the National Register if they meet any one of the four criteria of significance and if they sufficiently retain historic integrity. However, resources under fifty years of age can be determined eligible if it can be demonstrated that they are of "exceptional importance," or if they are contributors to a potential historic district. National Register criteria are defined in depth in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*. There are four basic criteria under which a structure, site, building, district, or object can be considered eligible for listing in the National Register.

Criteria

> <u>Criterion A (Event):</u> Properties associated with events that have made a significant contribution to the broad patterns of our history;
>
> <u>Criterion B (Person):</u> Properties associated with the lives of persons significant in our past;
>
> <u>Criterion C (Design/Construction):</u> Properties that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components lack individual distinction; and
>
> <u>Criterion D (Information Potential):</u> Properties that have yielded, or may be likely to yield, information important in prehistory or history.

Integrity

Once a resource has been identified as being potentially eligible for listing in the National Register, its historic integrity must be evaluated. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity. These aspects are location, design, setting, materials, workmanship, feeling and association.

> <u>Location</u> is the place where the historic property was constructed or the place where the historic event occurred;
>
> <u>Setting</u> addresses the physical environment of the historic property inclusive of the landscape and spatial relationships of the building(s);
>
> <u>Design</u> is the combination of elements that create the form, plan, space, structure, and style of the property;
>
> <u>Materials</u> refer to the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form the historic property;

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;

Feeling is the property's expression of the aesthetic or historic sense of a particular period of time; and

Association is the direct link between an important historic event or person and the historic property.

In order to be determined eligible for listing, these aspects must closely relate to the resource's significance and must be intact.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (California Register) is an inventory of significant architectural, archaeological, and historical resources in the State of California. Resources can be listed in the California Register through a number of methods. State Historical Landmarks and National Register-listed properties are automatically listed in the California Register. Properties can also be nominated to the California Register by local governments, private organizations, or citizens. The evaluative criteria used by the California Register for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places.

In order for a property to be eligible for listing in the California Register, it must be found significant under one or more of the following criteria.

Criteria

Criterion 1 (Events): Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

Criterion 2 (Persons): Resources that are associated with the lives of persons important to local, California, or national history.

Criterion 3 (Architecture): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.

Criterion 4 (Information Potential): Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

Resources eligible for the National Register are automatically listed in the California Register of Historical Resources.

Integrity

The process of determining integrity is similar for both the California Register and the National Register. The same seven variables or aspects that define integrity—location, design, setting, materials, workmanship, feeling and association—are used to evaluate a resource's eligibility for listing in the California Register and the National Register. There is a critical distinction between the two registers, however, and that is the degree of integrity that a property can retain and still be considered eligible for listing. According to the California Office of Historic Preservation:

It is possible that historical resources may not retain sufficient integrity to meet the criteria for listing in the National Register, but they may still be eligible for listing in the California Register. A resource that has lost its

historic character or appearance may still have sufficient integrity for the California Register if it maintains the potential to yield significant or historical information or specific data.[1]

SECRETARY OF THE INTERIOR'S STANDARDS

The Secretary of the Interior's Standards for the Treatment of Historic Properties (hereafter "*Standards*") establish the professional standards for work on historic buildings receiving funding assistance through the Historic Preservation Fund authorized by the National Historic Preservation Act. The Standards and associated guidelines are also often adopted by state and local permitting agencies for the purpose of reviewing potential projects involving historic resources. The *Standards* define four approaches to the treatment of historic properties, adapted below. A variety of factors contribute to the selection of an appropriate treatment, including the historic significance, physical condition, proposed use, and intended interpretation of the subject properties.

Preservation:

Focuses on the maintenance and repair of existing historic materials. Requires retention of the greatest amount of historic fabric, along with the building's historic form, features, and detailing as they have evolved over time. When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment.

Rehabilitation:

Acknowledge the need to alter or add to a historic building to meet continuing or new uses while retaining the building's historic character. When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment.

Restoration:

Allow for the depiction of a building at a particular time in its history by preserving materials from the period of significance and removing materials from other periods. When the property's design, architectural, or historical significance during a particular period of time outweighs the potential loss of extant materials, features, spaces, and finishes that characterize other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned, Restoration may be considered as a treatment.

Reconstruction:

Establish a limited framework for re-creating a vanished or non-surviving building with new materials, primarily for interpretive purposes. When a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction, Reconstruction may be considered as a treatment.

Once a treatment option has been established, an associated set of standards are applied. In addition to the *Standards*, the Secretary of the Interior publishes guidelines with specific examples to aid in interpreting how the standards are applied. For the purposes of this Basis of Design, the treatment approaches most appropriate to the four proposed project alternatives are Preservation and Rehabilitation.

[1] California Office of Historic Preservation, *Technical Assistance Series No. 6, California Register and National Register: A Comparison* (Sacramento, CA: California Office of State Publishing, November 2004)

Standards for Preservation:

1. A property will be used as it was historically, or be given a new use that maximizes the retention of distinctive materials, features, spaces and spatial relationships. Where a treatment and use have not been identified, a property will be protected and, if necessary, stabilized until additional work may be undertaken.
2. The historic character of a property will be retained and preserved. The replacement of intact or repairable historic materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and conserve existing historic materials and features will be physically and visually compatible, identifiable upon close inspection and properly documented for future research.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. The existing condition of historic features will be evaluated to determine the appropriate level of intervention needed. Where the severity of deterioration requires repair or limited replacement of a distinctive feature, the new material will match the old in composition, design, color and texture.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

Standards for Rehabilitation*

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.
5. Distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New additions, exterior alterations or related new construction will not destroy historic materials, features and spatial relationships that characterize the property. The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

*For the *Historic Preservation Tax Incentives Program*, there is a similar but distinct set of standards.

Further discussion of the appropriate treatment options for the Beatty Property Home can be found in the following sections of this Basis of Design Report.

CALIFORNIA HISTORICAL BUILDING CODE

The California Historical Building Code is Part 8 of the California Building Standards Code (California Code of Regulations, Title 24). The code provides performance-oriented rather than prescriptive provisions for permitting repairs, alterations, and additions necessary for the preservation, rehabilitation, and other associated work to enable the continued use of historical resources.[2] The code is intended to recognize the unique construction problems and obstacles to meeting code requirements of new construction when executing projects on historic resources that may have been constructed per earlier codes, or without any building code at all. From Section 8-101.2, Purpose:

> *The purpose of the CHBC is to provide regulations for the preservation, restoration, rehabilitation, relocation, or reconstruction of buildings or properties designated as qualified historical buildings or properties (Chapter 8-2). The CHBC is intended to provide solutions for the preservation of qualified historical buildings or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to preservation, and to provide for the reasonable safety of the occupants or users. The CHBC requires enforcing agencies to accept solutions that are reasonably equivalent to the regular code (as defined in Chapter 8-2) when dealing with qualified historical buildings or properties.*

Generally, qualified historical buildings may continue to be used as they were historically unless the continued use or occupancy constitutes a distinct hazard to life safety as defined in the CHBC.[3] For a change in occupancy, e.g. in the case of a rehabilitation or adaptive use, the property may need to be adapted to conform with the applicable requirements of its new use as defined in the CHBC.[4]

CALIFORNIA EXISTING BUILDING CODE

For existing buildings not designated as historic resources, the provisions of the California Existing Building Code (CEBC) apply to their repair, alteration, change of occupancy, addition, and relocation.[5] Per the 2016 CEBC, Section 101.3, the intent of the code is to "provide flexibility to permit the use of alternative approaches to achieve compliance with minimum requirements to safeguard the public health, safety, and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition, and relocation of existing buildings." The Beatty Property Home is an historic resource, but the CEBC may still be applied by the Authority Having Jurisdiction.

[2] California Historical Building Code, 2016, vii.
[3] 2016 California Historical Building Code, Section 8-102.1.4.
[4] 2016 California Historical Building Code, Section 8-302.2.
[5] 2016 California Existing Building Code, Section 101.2

BEATTY PROPERTY HOME

CURRENT HISTORIC STATUS

According to the California DPR form 523B for the Beatty Property Home prepared in 2010, the property appears eligible for listing in the California Register of Historical Resources under Criteria 1 and 3. Under Criterion 1 (events), the property was found to appear eligible for its association with the broad patterns of location and regional history as a remnant of the pioneer community of Alma.[6] Under Criterion 3 (design/construction), the property appears to be eligible as a property that embodies that characterizes the plank-frame (slab-sided) construction that was common of Western pioneer vernacular dwellings constructed in the area in the 1860s, of which very few remain.[7] Due to its association with the pioneer community of Alma, the period of significance for the Beatty property is bounded by its date of construction in 1866 and the destruction of the town of Alma for the construction of the Lexington Reservoir in 1952.[8]

The Beatty Property Home is not currently listed in the National Register of Historic Places or the California Register of Historical Resources.

CHARACTER-DEFINING FEATURES

Character defining features of the Beatty Property Home include the following:

Exterior:

- Siting of the home on a hill overlooking the property and the reservoir/former community of Alma.
- Massing relationship between the earliest portion of the home and subsequent additions.
- Intersecting gable roofs
- Absence of ornamental details at the façade; simple, flat trim around windows.
- T-shaped plan
- Divided-lite, double-hung wood windows.
- Board-and-batten plank-frame construction on oldest portions of house
- Horizontal siding over plank-frame construction on the portions of the house closest to the community of Alma.

Interior:

- Spatial relationships between the original portion of the home and subsequent additions

PERMITTING AGENCY – AUTHORITY HAVING JURISDICTION

The Beatty Property Home is located in unincorporated Los Gatos in Santa Clara County, California. The authority having jurisdiction for environmental approvals including the issuance of planning approvals and building and demolition permits, is the Santa Clara County Department of Planning and Development.

EXISTING CONDITIONS ASSESSMENT

On July 24th, 2019 Page & Turnbull performed a visual conditions assessment of the exterior and interior of the Beatty House Property, located at 17820 Alma Bridge Road, in unincorporated Santa Clara County, approximately 3.5 miles as the crow flies from downtown Los Gatos, California. The Beatty House sits atop a level site that drops off steeply to the West toward Alma Bridge Road. The site also slopes downhill to the north toward a gravel parking area with a seasonal stream beyond. Much of the immediate site is shaded beneath mature oaks, several of which are surrounded by decorative stone curbs/planter beds. It is operated by the

---

[6] VerPlanck, Christopher. California DPR 523B, Building, Structure, and Object Record, Beatty Property. 2010, pg. 1.
[7] Ibid.
[8] Ibid.

Midpeninsula Regional Open Space District. Conditions were examined at ground level for the building exteriors and interiors. For the assessment of structural conditions, please see the report produced by ZFA.

The conditions assessment investigated the following exterior building elements:

- Wood
  - Windows
  - Doors
  - Exterior wood cladding
  - Foundations
  - Porch
  - Roof cladding

The interior building elements investigated were the following:

- Wood
  - Floors,
  - Interior partitions,
  - Roof framing,
  - Order of additions to the building.

An analysis of specific code deficiencies for occupancy was not conducted, however general code considerations related to the four proposed project alternatives will be discussed as applicable.

Previous documentation provided to the Page & Turnbull team is listed below. The DPR 523A Historic Report by the State of California provides a detailed description of the different building materials and distribution of the spaces, although the assumptions dating the different additions may not be correct considering their distribution and volume in respect to window and door openings in the other sections. None of these reports includes recommendations related to the structural stability and material maintenance of the building.

- DPR 523A Historic Report Beatty Property, by the State of California – The resources Agency, Department of Parks and Recreation (dated August and September 2010)
- Archaeological assessment report for the Beatty Property, by Pacific Legacy Inc., (12/17/2010)
- Summary Historic Report Beatty Property, by Knapp & VerPlanck Preservation Architects (10/13/2010)

While the scope of this report does not include the preparation of restoration documents or specific recommendations for repairs, any costing of such work should consider that the work is to be performed in accordance with the Secretary of Interiors Standards for Rehabilitation which indicate the following hierarchy: protect and retain, repair, or replace in-kind (if deteriorated beyond repair).

Exterior

Windows

All windows are boarded up with plywood on the exterior leaving part of the framing visible from the outside. They are mostly single pane glazing double hung windows, with each sash is four-lite or six-lite equal sized glass single panes in the estimated original windows, being single-lite glass panes in the windows of the rooms from the time of the last alteration to the building. The surrounding cladding shows signs of modifications in the size or location of several windows, in most cases having a small section of wall cladding under the sill substituted by a metal sheet. The cladding surrounding the bathroom window is cut forming the shape of what could have been a door opening, suggesting the need for further investigation on the surrounding area of this window, to verify the existence of exterior steps or access to this suspected door. Visually they appear to be in fair condition, in need only of replacement of broken glass and painting of the wooden parts, though verification should be made to the operable parts of each to assess the need or lack thereof more extensive work.

Doors

All doors are boarded up with plywood on the exterior leaving part of the framing visible from the outside. The door from the dining room is visible from the inside of the house. It is a multi-panel white painted door with external lock sets, being the top half divided into six-lite single glass panes and the bottom half having one large wood panel. They appear to be in good conditions though some of the glass pieces are missing. The door from the parlor is partially blocked beneath the south porch described above. The door from the suspected storage room is similar to these, though it is currently removed from the frame and laying on the floor in the middle of the room.

The doors to the living room and to the pantry are of a more modern design corresponding to the last major modifications of the house, described in the DPR 523A report as being of post-World War II design, although these last doors were not visible during this assessment visit being boarded by plywood sheets, rendering their current conditions unknown.

Exterior Wood Cladding

The exterior wood cladding is composed by vertical board and batten system trimmed at the top and bottom by horizontal boards. The trim is missing in some sections. The left and middle sections of the south façade as well as the west façade have a second layer of cladding made of horizontal wood boards directly attached over the original cladding. The latter are in fair to poor conditions, being the most exposed sections to rain and direct sunlight and showing evident signs of weathering deterioration and wood decoloring. The crawling space is boarded with horizontal hinged boards along the western half of the north façade and with vertical boards along the west and two westernmost sections of the south façade. These boards are generally in fair to poor conditions, with some signs of water damage and weathering on the more exposed façades of the house. All other sections of the cladding are partially protected by surrounding trees being in good to fair conditions.

Foundations

The foundations for the building were not accessible making their conditions unknown, although the general state of square and plumb of the building attests for no significant failure of the foundations.

Porch

The current porch is in poor shape, being clearly an addition as the slope partially blocks the door frame of the exit door from the parlor, although it could be based on a previous existing porch. The rafters are attached to the façade, not being a prolongation of the roof structure of the building, and with part of their support metal elements resting halfway on the window headers. The floor is cast in place concrete, and the westernmost section is partly collapsed.
The roofing is of asphalt shingles supported by sheets of plywood, not fully joined where it meets the end of the living room roof as can be seen from underneath. In this case the shingles are the only element preventing water filtering along this joint.

Roof cladding

The original roof cladding has been substituted by asphalt shingles over a plywood sheathing, nailed directly onto the historic sheathing. It appears to be in good conditions on the exterior, although there are signs of humidity and possible water infiltrations underneath the more complex points where the roof structure and slopes from the different buildings joins together.

Interior

Interiors were evaluated for the presence of protected animal species residing in the building, current conditions of the different elements and identification of the original building and later additions. Page & Turnbull was directed to focus our conditions assessment on stabilizing and mothballing the original building retaining only those additions deemed necessary to provide protection for the original elements.

Floors

The original floors have a base made possibly of fir planks, covered by resilient carpet patterned tar paper which may be original, in the dining and living room and bedrooms, and more modern resilient flooring in the bathroom and kitchen and pantry. The parlor and the corridor are carpeted. Conditions of the base wood are mostly unknown as only some parts were visible, though the visible areas are in fair condition, showing some general darkening where not covered by the floor finishes, and requiring some maintenance. Only exception is what's considered the storage room without flooring finish and several floor boards missing.

Interior Partitions

The only original partition clearly visible is the one separating the dining room from the parlor, being of vertical single planks of wood mostly covered in cardboard drywall, not showing signs of moisture related deterioration or insect attacks, being in good conditions where visible. Other partitions are modifications of the exterior cladding when an addition turned it into a partition, except for the partitions of the northern half of the L-shape addition, which are visible from the inside of the closets, and formed by more modern stud framed walls covered in plywood and in good conditions in the visible areas. Most walls have an interior finish of cardboard drywall making unknown the exact current conditions of the underlying walls, though they appear to be in sound conditions. Recommended more extensive investigation to verify conditions or need of any treatments. Beneath the cardboard drywall there are traces of decorative paintings or painted paper in the living room walls, which would require more extensive research to determine its conditions and historic value.

Roof Framing

The roof framing is concealed mostly beneath burlap, fiberglass boards or other ceiling finishes not allowing to view the roof framing structure making its conditions generally unknown. The exception to this are some openings in different corners of some rooms where the ceiling has partially collapsed. The visible sections of roof framing through these show high levels of decoloring, humidity and rot of the original sheathing, and of parts of the framing structure, though the replacement of the roof cladding appears to have reduced or stopped water leakage, improving its conditions. Anyway, further evaluation is recommended to verify this point prior to deciding on treatment.

Also necessary to take in consideration the fact that these openings also serve as exit points for several bats that apparently have their nesting grounds between the roof and ceiling of the house, which should be addressed to prior to any additional work is carried out in the building.

Figure 1

South façade of ca. 1870 addition. Window is addition possibly from the World War II interior modifications as it doesn't have the metal piece under the sill that other windows do on the façades with this cladding

Figure 2

South façade of ca. 1877 addition. Windows and door correspond to the World War II modifications. Porch is addition covering partially the door exiting from the original dwelling.

Figure 3

South and west façades of the ca. 1870 addition. Second cladding horizontal layer heavily weathered due to lack of protective treatment and care. Electric connections and meter are in this corner.

Figure 4

Close-up of lost piece of horizontal cladding where underlying vertical original cladding can be seen, also heavily weathered

Figure 5

East façade (left) of the L-shaped addition. Door is blocked at the top end by the porch. The horizontal second layer of cladding was added before the extra feet connecting the buildings was added as it continues beneath the façade of the connection

Figure 6

Right side of the East façade. Open shed is the latest addition to the building and has direct access to the pantry from the previous addition. The visible change in roof slope corresponds to the original building vs the kitchen and pantry addition

Figure 7

North façade of the kitchen and pantry. Roof has a gentler slope indicating its' belonging of a later addition date. Several elements have been replaced by more modern materials like T-111 siding

Figure 8

Close-up of cladding under the bathroom window, clearly different from the cladding of the rest insinuating it may have been originally a door opening that was later partially closed to form the current bathroom window

Figure 9

Windows of the north façade of the L-shape addition. The metal pieces under the sills indicates they were moved upwards or reduced in size during modifications to match height of other windows in the building

Figure 10

Bathroom window. Opening suspected to be created partially using the existing opening from a presumably previous existing door. The initial height of the cladding boards used insinuates the possibility of a landing and steps leading up to the house. Recommended archaeological study of the area beneath to verify preexisting conditions.

Figure 11

West façade and westernmost section of south façade. Corresponding to the L-shaped addition. All windows except the one in the center, belonging to the hallway, have been moved upwards or modified and reduced in size after the second layer of cladding was installed having a metal piece under the sills to cover up the gap originated during this modification

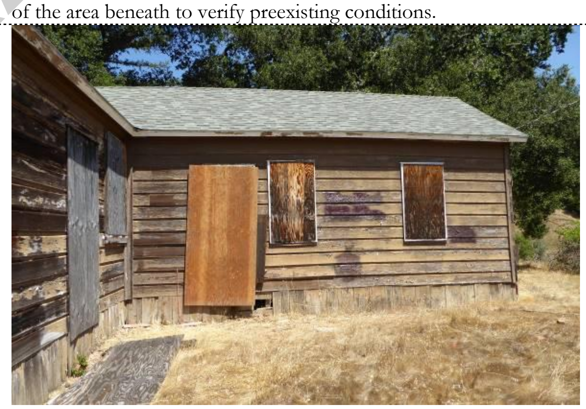


Figure 12

West façade of the L-shape, corresponding to the dining room and pantry. The roofs of the entire dwelling are relatively new, consisting of recent plywood sheathing nailed to historic spaced sheathing and covered in asphalt shingles.

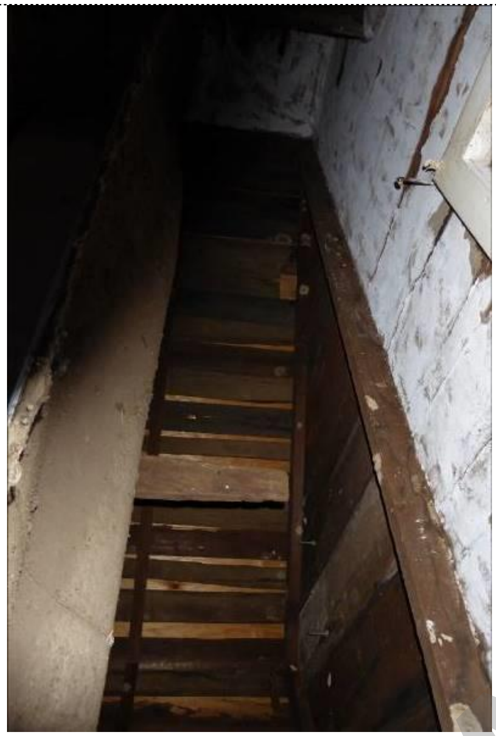


Figure 13

Opening in the ceiling to the roof structure in the parlor. Current nesting area for bats, sighting of bats not visible in this photo. Recommend removal by experienced personnel following appropriate directions by biological monitors prior to any repairs in these particular areas

Figure 14

Sighting of bat resting above the window in the unfinished room. Other signs throughout the whole building suggest the possibility of several nests in the house

Figure 15

Double level ceiling of the living room. The lower section could have been part of the original east façade of the building or a porch covering its eastern side

Figure 16

Hanging lower ceiling in the living room as seen through an opening. Clearly the vertical boards could be part of an original façade that was later modified. Evident humidity and rot signs, especially where the different roofing areas merge. Visible the new plywood sheathing directly over the historic one

Figure 17

Current gyp board finish nailed over pre-existing floral painting finish board

Figure 18

Bedroom 2 is accessed descending one step from the living room, insinuating construction at a later phase. Carpeted floor, single flush door, 1/1 window, and isolation on ceiling insinuate a relatively modern build

Figure 19

Current ceiling of bedroom 1 include modern materials as fiberglass isolation and others. Walls are covered in faux wood paneling over isolation with fiberglass, indicating it underwent modifications in more recent times.

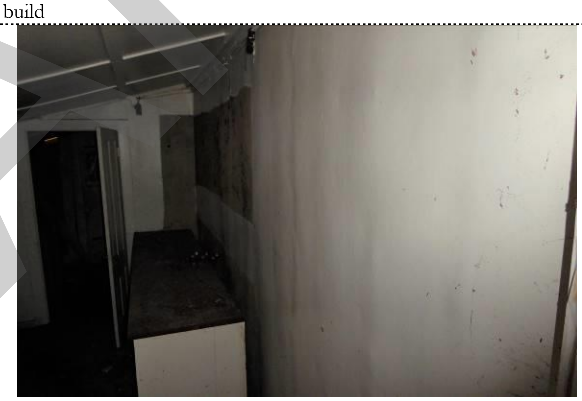


Figure 20

Kitchen with access to the pantry on the far side. Several cabinets have been removed. These rooms belong to the latest addition (not counting the shed) and add little value to the historic elements of the dwelling.

Figure 21

Living room, exit door with mid-19th century rim locks, and window to the west façade. Wall finish not properly attached needs reattachment if possible or replacement when not possible to reattach.

Figure 22

Original floor sheet in rug pattern over tar paper currently folded in half. Would require rehabilitation treatment to rejoin both halves and to bring out the original colors prior to final reinstallation

Figure 23

Parlor, with carpeted floor and unfinished walls and ceiling insinuate that it was previously used as a bedroom before the final modifications to the house

Figure 24

Wall boards conforming the façades and partitions are covered directly by the interior finish cardboard with no isolation layers in between

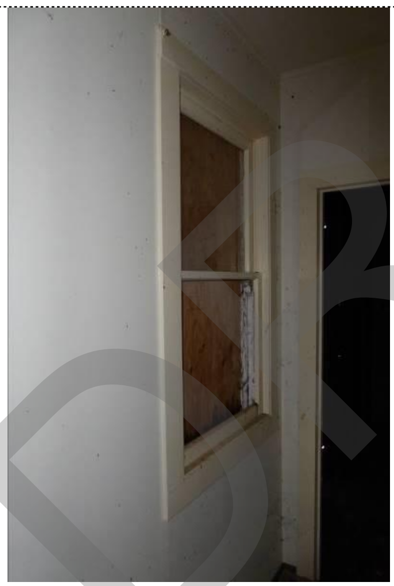


Figure 25

Corridor window, design clearly corresponds to a latter period from that of the building of this section. Walls covered in gypsum board

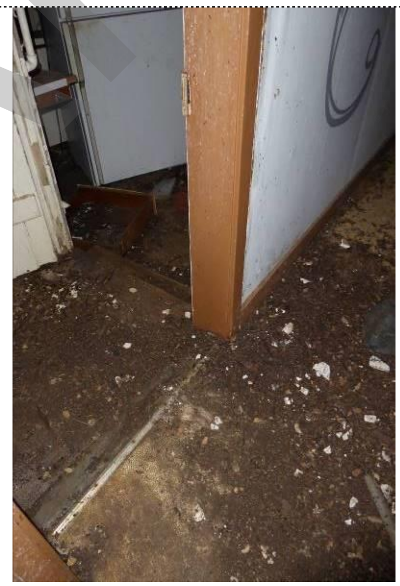


Figure 26

Door communicating to the corridor, and steps going down from this to the kitchen. The slight slope downwards into the corridor at the door footer could indicate that this was originally the location of an exit door

Figure 27

Floor of bedroom 1, floor finish is also a sheet in rug pattern over tar paper

Figure 28

Bathroom window where presumably there was originally an exit door

Figure 29

Bathroom with a pedestal sink and moderne style bathtub. This corresponds to the time of the last interior modifications of the house

Figure 30

interior of closet from bathroom. Similar disposition in bedroom 1 and storeroom closets. Being single plywood sheathing over wood posts

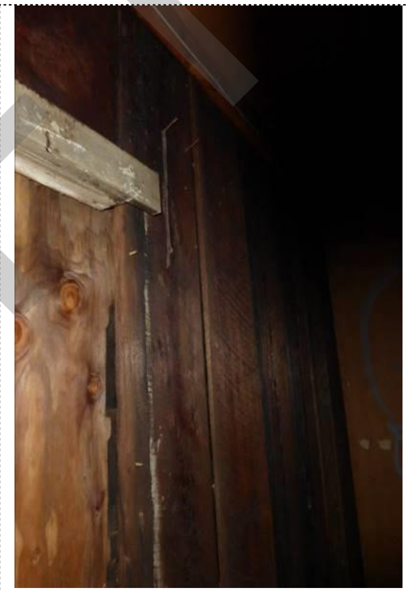


Figure 31

South façade and door opening of the storeroom don't have finish treatment, currently the door is laying on the floor of the room

Figure 32

Storeroom floor is missing several boards. Walls and ceiling are unfinished, but having a closet (top left corner), insinuates the intention to turn it into a bedroom. Exit door is currently on the floor and obviously belongs to the earlier years of the house

Figure 33

Living room and access to bedroom 2. Estimated original building, though the modern finishes indicate it was modified at a later period. Access to bedroom 2 is descending one step, which could indicate different construction phases

Figure 34

Double level ceiling of the living room. The lower section could have been part of the original east façade of the building or a porch covering its eastern side

Figure 35

Hanging lower ceiling in the living room as seen through an opening. Clearly the vertical boards could be part of an original façade that was later modified. Evident humidity and rot signs, especially where the different roofing areas merge. Visible the new plywood sheathing directly over the historic one

Figure 36

Current gyp board finish nailed over pre-existing floral painting finish board

Figure 37

Bedroom 2 is accessed descending one step from the living room, insinuating construction at a later period. Carpeted floor, single flush door, 1/1 window, and isolation on ceiling insinuate a relatively modern build

Figure 38

Current ceiling of bedroom 2 include modern materials as fiberglass isolation and others. Walls are covered in faux wood paneling over isolation with fiberglass.

Figure 39

Kitchen with access to the pantry on the far side. Several cabinets have been removed. These rooms belong to the latest addition (not counting the shed) and add little value to the historic elements of the dwelling, being the most heavily remodeled or built with most modern elements.

PROPOSED PROJECT ALTERNATIVES EVALUATION

The following evaluation concerns the work required to address architectural deterioration and deficiencies, and plan for the necessary building maintenance associated with the proposed project alternatives. For recommended structural stabilization and rehabilitation work, please see the report produced by ZFA.

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.

   This option proposes to install a fence around the perimeter of the property to restrict access to the home in order to mitigate potential public safety concerns associated with unauthorized access to the building. No distinct hazards were observed at the exterior of the building at the time of survey in July, 2019, however it may be advisable to remove some of the building additions that are in poor condition and may become hazards with future deterioration. Since this option does not seek to stabilize the resource for any future use or prevent further deterioration, it would not be consistent with the Secretary of the Interior's Standards. Existing conditions that threaten the historic resource include the wildlife residing in the structure, collapsing floors and ceilings, and deterioration of the cladding allowing weather, insects, and animals entry to the resource.

2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

   Of the treatments defined by the *Secretary of the Interior's Standards*, the standards for Preservation are most appropriate to this proposed project alternative. Mothballing efforts should comply with the National Park Service's Preservation Brief #31, *Mothballing Historic Buildings*. The purpose of mothballing as defined in the Brief is to control the long-term deterioration of the building while it is unoccupied and to find methods to protect it from sudden loss by fire or vandalism. General recommendations for this approach are described below.

   To provide safe perimeter access to the Beatty Property Home for the purposes of maintenance and interpretation, the derelict, framed shed on the east side of the home should be carefully dismantled and removed. The wildlife currently inhabiting the building should be relocated per District standards. Holes and gaps in the envelope that allow for the intrusion of wildlife and water into the building interior should be patched per preservation best practices. Other deteriorated elements of the historic building envelope described in the Conditions Assessment should also be repaired per preservation best practices. Areas and/or elements of the building envelope that are deteriorated beyond repair should be replaced in-kind to match the original elements and construction techniques. Extant original board-and-batten siding should be repaired. The collapsing floor should be stabilized, and the existing hole in the floor should be covered securely. The existing plywood covering the doors and windows should be inspected semi-annually and re-secured as required. Adequate ventilation shall be installed that is sufficiently protected from the intrusion of additional insects and wildlife. Following necessary repairs, exterior wooden elements should be prepared and painted; building should be repainted every 7-10 years to maintain the coating protecting the historic substrate.

   The roof and drainage systems should be inspected at least semi-annually before and after the rainy season and cleared of debris to allow for proper drainage. The interior of the home should be inspected at least three times annually coinciding with before, during, and after the rainy season to check for leaks; localized repairs may be undertaken if appropriate, but the roof should be replaced as required at the end of its designed service life. Asphalt shingle roofs should typically be replaced every 25-years. Trees around the home should be maintained and trimmed as necessary for their health and stability to reduce the risks to the home of falling limbs or trees. Security measures should be undertaken and installed at potential points of access in order to protect the building and the public.

3. **Repair and rehabilitate the structure for reuse** as a limited use retreat space.

Of the treatments defined by the *Secretary of the Interior's Standards,* the standards for Rehabilitation are the most appropriate to this proposed project alternative. The existing condition and location of the property present several challenges for this proposed project alternative. Because the Beatty Property Home was found historically significant in part for its association with the historic pioneer community of Alma, relocating the structure would significantly compromise the property's integrity of location, setting, feeling, and association, and consequently its significance as an historic resource. Relocating the building would be inconsistent with Rehabilitation Standards 1 and 2. If the building is rehabilitated for occupancy, alternative means of supplying potable water to the historic site should be explored.

The windows, doors, trim, and siding of the home should be repaired and rehabilitated rather than replaced. Areas and/or elements of the building envelope that are deteriorated beyond repair, should be replaced in-kind to match the original elements and construction techniques. Given the existing condition of the building interior, significant abatement of hazardous materials would likely be required to make the building safe for occupancy. The wildlife currently occupying the building would have to be relocated per District standards, and their waste products would need to be properly removed. Interior finishes are in a state of considerable disrepair and would likely need to be removed and replaced. Areas where the floor has failed must be repaired, with missing materials or those deteriorated beyond repair replaced in kind to match the existing sound material. The bathroom fixtures would need to be replaced. If the District chooses to provide a kitchen for the rehabilitated structure, the existing fixtures and appliances would also need to be replaced.

The proposed use as a limited retreat would likely be classified as a transient lodging and be required to meet the associated accessibility provisions of the California Building Code. A formal accessibility review was not part of the scope of this investigation, however based on observations of the site and building, the following existing barriers to accessibility were observed:

- None of the existing doors are level with the exterior grade.
- As-built drawings by ZFA Structural Engineers indicate the clear space at the building doors is less than the 29-1/2 inches allowed by the 2016 CHBC section 8-603.3.
- There are multiple level changes of at least one step inside the building corresponding with various historic additions to the original portion of the structure.

Alterations to make the building compliant with accessibility code requirements should be designed to not compromise the character-defining features of the building, and should be installed in a way that is reversable to the extent possible.

4. **Remove the structure** and restore the underlying natural resource values.

Demolishing the Beatty Property Home, which has been determined to be an historic resource, may require additional processes to obtain demolition permits. Debris from the demolished building, including all hazardous materials, would need to be disposed of in accordance with Local, State, and Federal Regulations, and the site would need to be cleaned up and remediated to allow for public access.

EXHIBIT B

Structural Condition Assessment and Basis of Design

by ZFA Structural Engineers

Attachment 3

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

BEATTY PROPERTY HOME STRUCTURAL CONDITION ASSESSMENT REPORT AND BASIS OF DESIGN (BOD)

Midpeninsula Regional Open Space District

Sierra Azul Preserve, Santa Clara County, California

District Project Number: MAA22-004

March 13, 2020

Prepared For

Midpeninsula Regional Open Space District

330 Distel Circle

Los Altos, CA 94022

Prepared By

Steven Patton, SE, Senior Associate

Mark Moore, SE, Principal-in-Charge

San Carlos, California

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

The following structural Basis of Design report provides an evaluation of the condition and anticipated performance of the existing Beatty Property Home structure to support seismic and gravity loading as well as a conceptual design of the structural scope required to achieve four proposed project alternatives. The findings and recommendations contained herein, in conjunction with those from the other team members, are intended to assist the District with cost evaluations and decision-making. The four alternatives being considered are:

1. **Retain structure in current state.** Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance.
2. **Stabilize the structure** and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.
3. **Repair and rehabilitate the structure for reuse** as a limited use retreat space. The California Historic Building Code (CHBC) would be utilized to define the design criteria.
4. **Remove the structure** and restore the underlying natural resource values.

Structural Condition Assessment

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. During one site visit with the hazardous material specialist, the District staff allowed access to interior portions of the building. The interior review included a walkthrough of the ground floor and crawl space areas. No access was provided to the building's roof. The structure appears to be in generally poor to fair structural condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review. As-built drawings contained herein were created by ZFA based on visual observations and measurements made during site visits.

The following major structural deficiencies were also observed in the existing building; all photos referenced can be found in the *Structural Systems and Condition Assessment* section.

- The structure is founded on wood posts that sit directly on the soil and show evidence of moisture/ rot damage (see Photos 1, 5, and 13). No foundation is present. This condition has likely also contributed to differential settlement across the structure.
- There are holes in the floors, walls, and ceiling where sheathing is missing or damaged (see Photos 6, 7, and 8).
- The is a partially collapsed portion of the shed roof along the south edge of the building (see Photo 9).
- The collar ties between the rafters do not appear to be structurally adequate, and there is no ridge beam present to span between collar ties. (see Photo 8).
- The existing 3x (flat) floor girders do not appear to be structurally adequate (see Photo 13).
- The framed shed on the east side of the home is derelict and not stable (see Photos 2 and 10). This element of the structure should be removed.

Seismic Assessment

The Beatty home has been reviewed for the Collapse Prevention performance level using the Tier 1 evaluation of the ASCE 41-17 standard *Seismic Evaluation and Retrofit of Existing Buildings*. The building was reviewed based on the visual assessments performed by ZFA staff, geological investigation performed by Romig Engineers and ASCE 41-17 structural Tier 1 checklists. Nonstructural elements were not included in the scope of the Tier 1 analysis.

The building is framed using light 1x planks oriented vertically on the exterior, and a second layer of 1x planks oriented horizontally on the interior, to form the exterior walls. The short crawl space of the structure below the ground floor level is laterally supported by 1x horizontal braces. The structure lacks a complete load path and is expected to perform poorly during a significant earthquake. Ten (10) Tier 1 deficiencies were identified as noncompliant, see the Findings and Recommendations section of report for additional information on the items noted below:

- LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
- There is no defined lateral force-resisting system present in the existing structure. The interior and exterior siding are not adequate to transfer seismic forces to the foundation. The horizontal sheathing roof is not adequate to act as a roof diaphragm.
- The structure is supported directly on the soil with no foundation.
- TIES BETWEEN FOUNDATION ELEMENTS: The foundation does not have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.
- SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure is more than 100 lb/ft for straight sheathing.
- WALLS are not positively CONNECTED THROUGH FLOORS: Shear walls do not have an interconnection between the ground story walls and crawlspace walls to transfer overturning and shear forces through the floor.
- CRIPPLE WALLS below first-floor-level shear walls are not braced to the foundation with wood structural panels.
- WOOD SILLS are not bolted to the foundation.
- WOOD SILL BOLTS are not present.
- WOOD POSTS: There are no foundations, and therefore no positive connections between wood posts and the foundation.
- GIRDER/COLUMN CONNECTION: There is no positive connection using plates, connection hardware, or straps between the girders and the column supports.
- ROOF CHORD CONTINUITY: Continuous roof diaphragm chords are not present around the perimeter of the roof.

Geotechnical Investigation

Based on the geotechnical investigation, the primary geotechnical concerns at the site (and the reference page in the geotechnical investigation report) are:

- The potential for severe ground shaking at the site due to moderate to large earthquakes in the area (page 6).

The following evaluation report details our structural findings and recommendations.

INTRODUCTION

The purpose of this evaluation is to review and evaluate the structure of the subject building using visual observations, engineering judgment and criteria provided by ASCE 41-17. The evaluation is focused on identifying deficiencies that are present in the structural system that may affect the performance of the building under gravity or seismic loads to identify structural scope that is required to stabilize the building for mothballing or rehabilitate it as an occupied structure.

The seismic evaluation is based on criteria that has been tailored for specific building types and desired levels of building performance based on observation of structural and nonstructural damage occurring in previous earthquakes and provides a means to identify general deficiencies based on anticipated behavior of specific building types. The Tier 1 evaluation procedure of ASCE 41-17 was used to assess primary components and connections in the seismic force-resisting system using standard checklists and simplified structural calculations. Checklist items are general in nature and are intended to highlight building components that do not exceed conservative construction guidelines. If the element is compliant, it is anticipated to perform adequately under seismic loading without additional review or strengthening. Items indicated as non-compliant in a Tier 1 checklist are considered potential deficiencies that require further analysis. The results of the Tier 1 evaluation provide a general understanding of the anticipated performance of the structure in its current state and inform the structural scope required to provide overall stability if the building is to be mothballed with no public access to the interior. If the building is to be rehabilitated for an occupied use, the Tier 1 results indicate that retrofit of the structure is required. The retrofit is designed to the governing building code, which is the 2016 or 2019 California Historical Building Code. The structural scope for these alternatives, as well as restricted access and demolition options, are summarized in this report.

EVALUATION OVERVIEW

This structural evaluation report for the existing Beatty Property Home is based on the following:

- The American Society of Civil Engineers/ Structural Engineering Institute (ASCE/SEI 41-17) Standard for Seismic Evaluation and Retrofit of Existing Buildings - Tier 1, Collapse Prevention level structural evaluation criteria.
- Multiple site visits for general review of the structure were performed by Steven Patton of ZFA. No destructive testing or removal of finishes was performed or included in the scope.
- Existing material properties as indicated in Appendix C.
- Review of the following geotechnical report and hazard maps:
    - Geotechnical Report prepared by Romig Engineers dated October 2019

STRUCTURE OVERVIEW

<u>General Site Description</u>

The building is located on a gentling sloping site located in the Midpeninsula Regional Open Space District (District) Sierra Azul Open Space Preserve east of Lexington Reservoir and just east of Alma Bridge Road, near Los Gatos, California. Several medium to large trees and native grasses are present surrounding the building. The building is currently unoccupied.

<u>Structural Performance Objective</u>

In accordance with ASCE 41-17, a structural performance objective consists of a target performance level for structural elements in combination with a specific seismic hazard level. For seismic assessment of the subject building, the Basic Performance Objective for Existing Buildings (BPOE) was selected. While the BPOE seeks safety for occupants with reasonable confidence, it allows existing structures to be assessed for seismic forces that are less than those required for the design of new structures under the current building code (2016 or 2019 California Building Code). Buildings meeting the BPOE are expected to experience nominal damage from relatively frequent, moderate earthquakes, but have the potential for significant damage and economic loss from the most severe, though less frequent, seismic events. It should be noted that the cost savings from not retrofitting the subject building up to current code standards may result in greater repair costs in the event of an earthquake.

For the purposes of this Tier 1 review to the BPOE, the specified level of performance is **Collapse Prevention (S-5)** for this equivalent residential use building (Risk Category II as defined by ASCE 7). The Collapse Prevention Structural Performance Level as described by ASCE/SEI 41-17 is defined as: "…the post-earthquake damage state in which a structure has damaged components and continues to support gravity loads but retains no margin against collapse. A structure in compliance with the acceptance criteria specified in this standard for this Structural Performance Level is expected to achieve this state." Retrofit of the building to satisfy this performance objective would only be mandatory for *Alternative 3* which would allow for re-occupancy of the unpermitted building.

The S-5 Structural Performance Level can be defined as less than the Life Safety (S-3) performance level. For further context, the Life Safety Structural Performance Level (S-3), is described as: *'… the post-earthquake damage state in which significant damage to the structure has occurred but some margin against either partial or total structural collapse remains.'*

A Tier 1 evaluation of nonstructural elements was not included within the scope of this review.

Site Seismicity (Earthquake Activity)

In accordance with ASCE 41-17, 'seismicity', or the potential for ground motion, is classified into regions defined as Low, Moderate, or High. These regions are based on mapped site accelerations S_s and S_1, which are then modified by site coefficients F_a and F_v to produce the Design Spectral Accelerations, S_{DS} (short period) and S_{D1} (1-second period). The successful performance of buildings in areas of high seismicity depends on a combination of strength, ductility of structural components, and the presence of a fully interconnected, balanced, and complete seismic force-resisting system. Where buildings occur in lower levels of seismicity, the strength and ductility required for better performance is significantly reduced and building components or connections with additional strength capacity can in some cases be adequate despite lacking ductility.

Based on the geotechnical investigation and report prepared for the subject site, the soil profile of this building has been determined by the geotechnical engineer to be classified as **Site Class C** as defined by ASCE 41-17 and is used in determination of site coefficients F_a and F_v.

According to the site values indicated by the geotechnical report, USGS data and evaluated using seismic acceleration equations and tables of ASCE 41-17, the site is located in a region of **High Seismicity** with a design short-period spectral response acceleration parameter (S_{DS}) of 1.554g and a design spectral response acceleration parameter at a one second period (S_{D1}) of 0.962g. Per the table shown below, both of these parameters exceed the lower boundaries for high seismicity classification, 0.5g for S_{DS} and 0.2g for S_{D1}.

*Level of Seismicity**	S_{DS}	S_{D1}
Low	< 0.167g	< 0.067g
Moderate	≥ 0.167g < 0.500g	≥ 0.067g < 0.200g
High	≥ 0.500g	≥ 0.200g

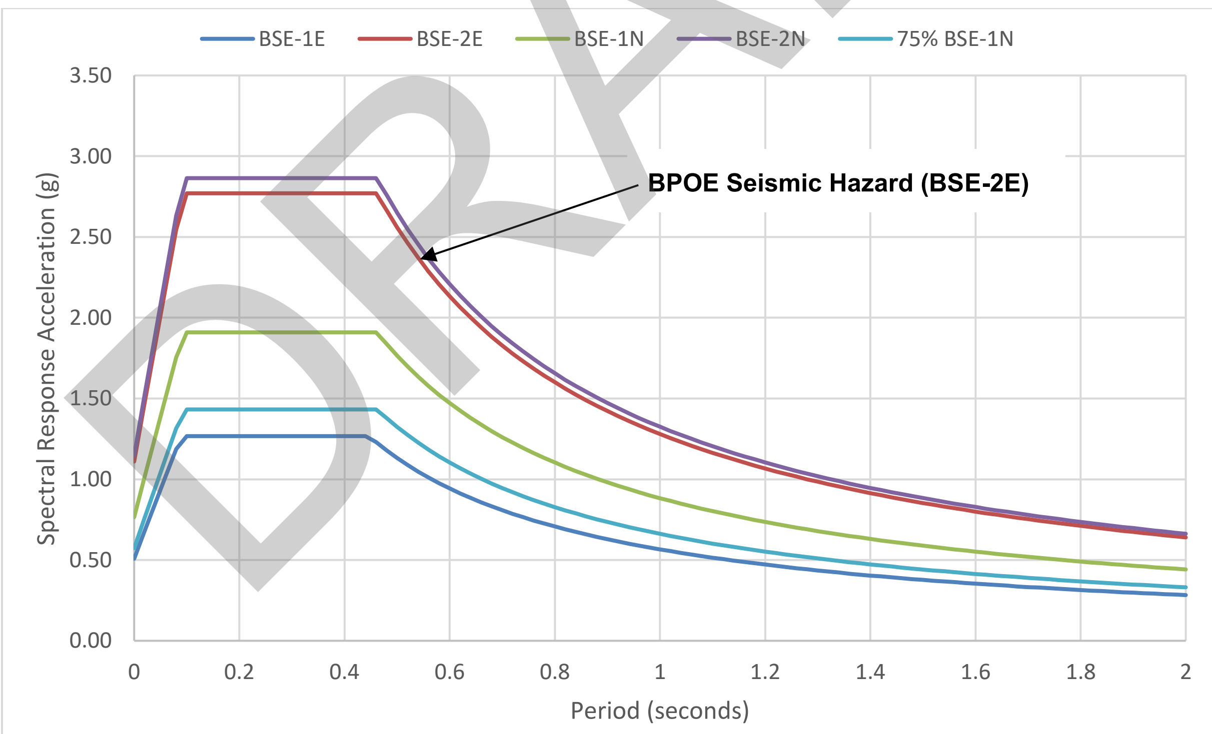
*Where S_{XS} and S_{X1} values fall in different levels of seismicity, the higher level shall be used.

The spectral response parameters S_S and S_1 were obtained for the BSE-2E seismic hazard level for existing structures (BPOE). The acceleration values were adjusted for the maximum direction and site class in accordance with ASCE 41-17 Section 2.4.1, and compared to BSE-2N (defined by current building code as the maximum considered earthquake for design of new buildings) to determine the design values for the Tier 1 analysis, since values obtained for the BSE-1E hazard level need not exceed the hazard levels for new construction.

The following charts depict the response spectra for the multiple seismic hazard levels defined by ASCE 41-17: two existing hazard levels and two hazard levels corresponding to code design of new structures (ASCE 7). Note that the seismic hazard level for design of existing structures is lower than that for new construction for this structure (period <1.0).

Seismic Hazard Level*	Building Code Reference	Design Spectral Acceleration $S_{a(XS)}(T)$
BSE-1E	ASCE 41-17 (20%/50yr)	1.270g
BSE-1N	ASCE 7-10 Design Basis Earthquake (DBE)	1.914g
BSE-2E	ASCE 41-17 (5%/50yr)	2.777g
BSE-2N	ASCE 7-10 Maximum Considered Earthquake (MCE)	2.871g

* Seismic hazard levels denoted with 'E' for existing buildings or 'N' for new building equivalency.



<u>Structural Systems and Condition Assessment</u>

General

The one-story wood-framed residential building was originally constructed between 1866 and 1877. The roof is approximately 12 feet above grade at its highest point. The building footprint is approximately 1,440 square feet. Plans, sections and elevations are shown for reference in Figures 1 through 4. Refer to Appendix B for a complete set of annotated structural drawings. Modifications to the existing structure, including installation of some plywood roof sheathing and asphalt roof shingles, appear to have occurred since the original construction. Additionally, the pantry and shed located in the northeast corner appear to be additions added later at an unknown time.

Visual assessments were performed during multiple site visits in 2019 by Steven Patton of ZFA. The exterior and interior of the structure was observed. During one site visit with the hazardous material specialist, the District staff allowed access to interior portions of the building. The interior review included a walkthrough of the ground floor and crawl space areas. No access was provided to the building's roof. The structure appears to be in generally poor to fair structural condition with obvious structural damage and deterioration apparent. No original construction structural drawings are available for review. Existing drawings contained herein were created by ZFA based on visual observations and measurements made during site visits.

Roof Framing

The roofing is composed of asphalt shingles supported directly on 1x horizontal lumber decking oriented up-down slope that forms the roof diaphragm. The 1x decking is supported by 1x framing at approximately 24" on center which spans between the roof rafters. The roof rafters are 2x4 nominal spaced approximately 36" on center and clear span from the ridge to the exterior walls (See photo 8). 1x6 collar ties span between the rafters below the ridge to help resist horizontal thrust and allows the rafters to span between exterior bearing walls. There does not appear to be a ridge beam or ridge board. The existing roof framing plan is shown in Figure 1 below.

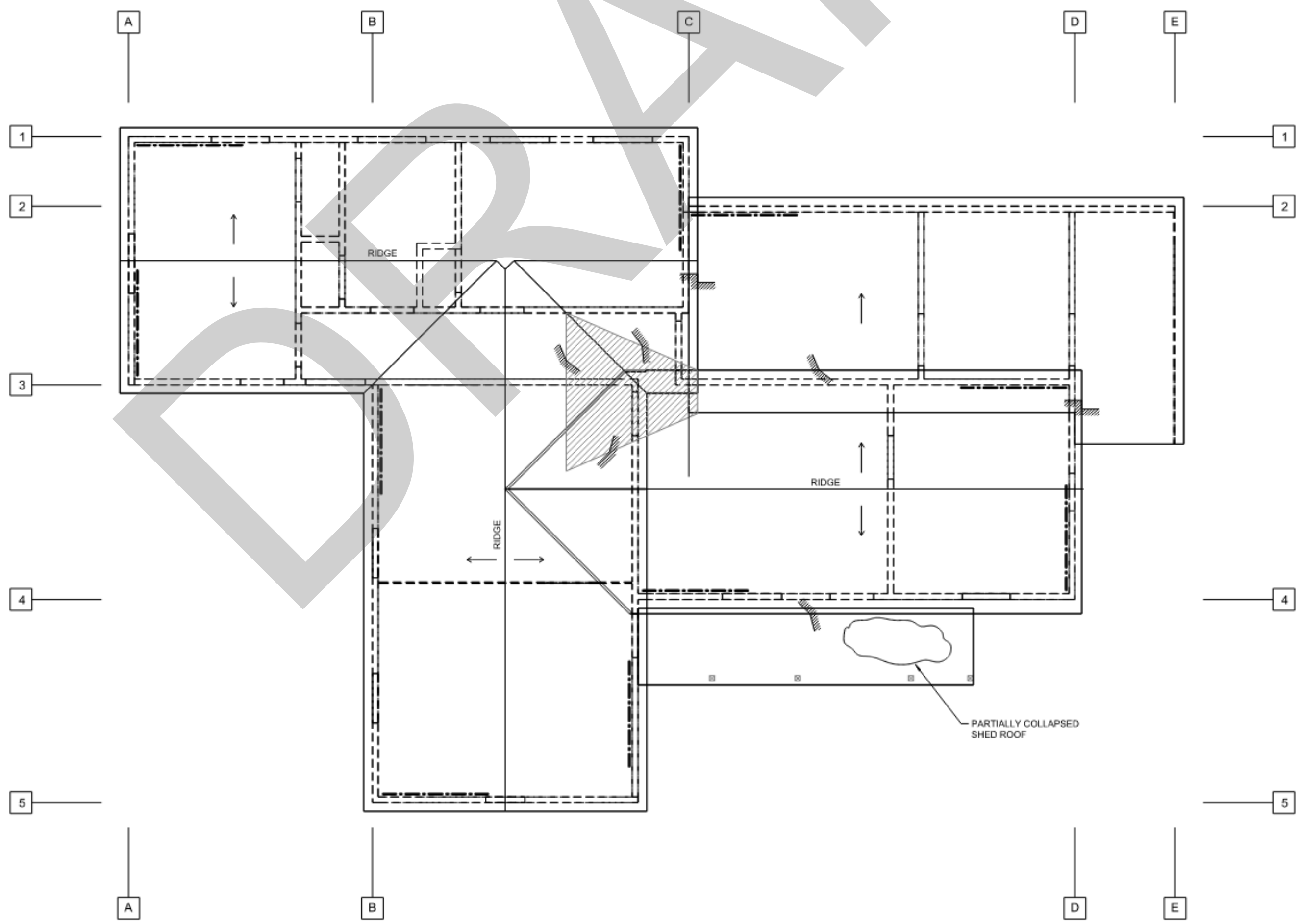


Figure 1: Roof Framing Plan from ZFA-prepared Existing Condition Drawings

Full building elevations are shown in Figures 2 and 3 below.

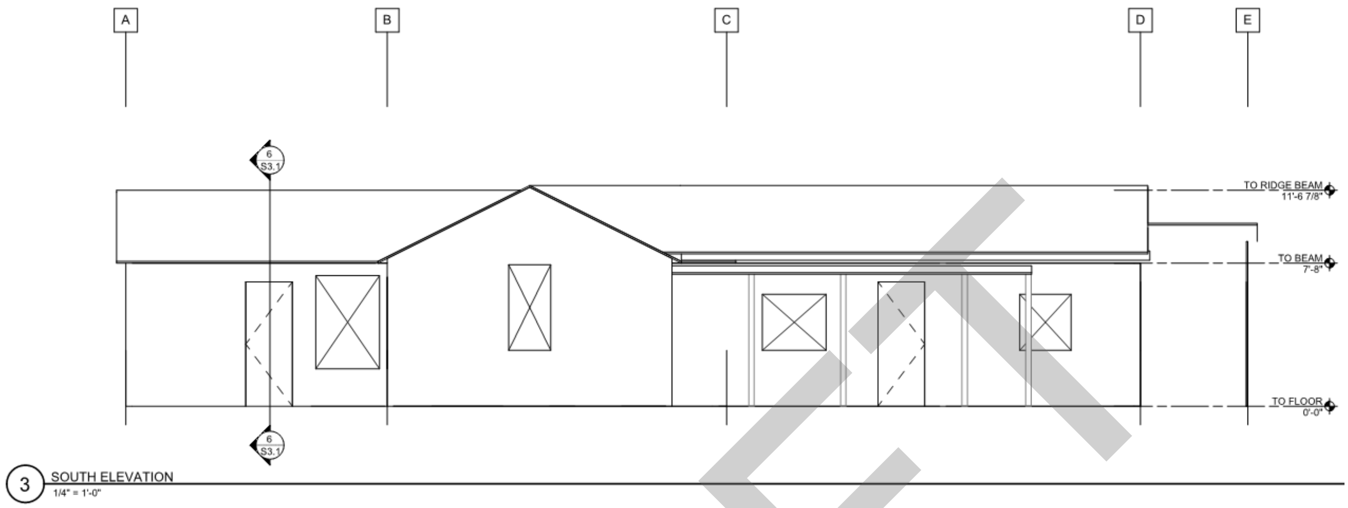


Figure 2: South Elevation from ZFA-prepared Existing Condition Drawings

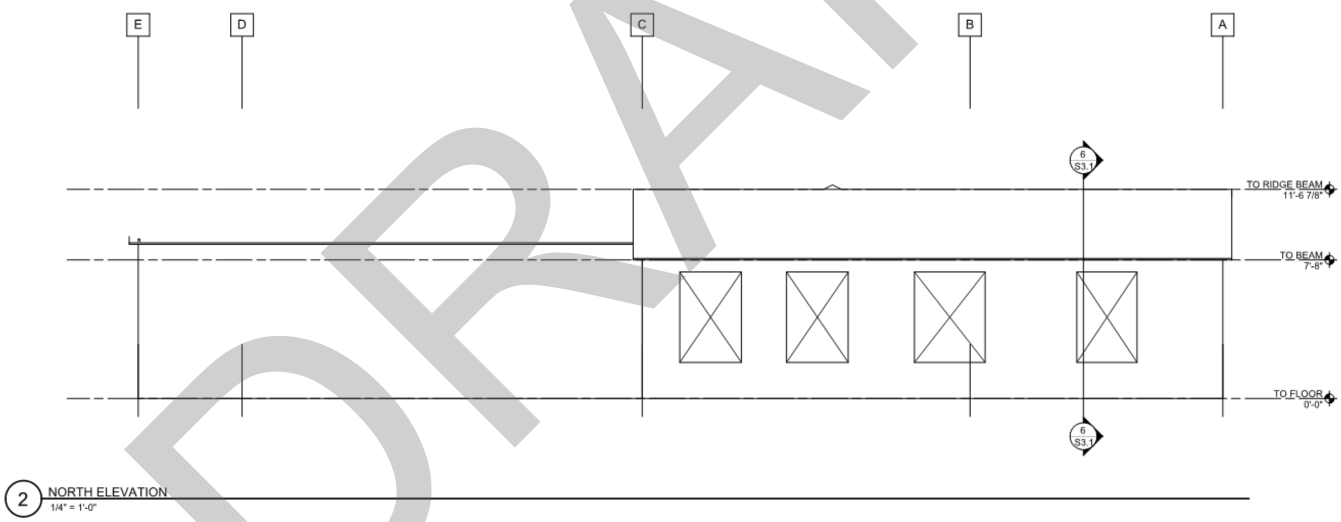


Figure 3: Full Building North Elevation from ZFA-prepared Existing Condition Drawings

Walls

Walls above the ground floor are typically framed with horizontal 1x siding on the exterior, and vertical 1x to 2x siding on the interior face. Vertical wood framing within the wall may also be distributed throughout the bearing walls but was not observed while on site. The original interior partition is framed with1x wood siding as well. Wood siding is missing in some locations, creating openings in the walls allowing water and pests to enter the building. The crawlspace walls are framed with 3x posts spaced at approximately 4 feet on center, with exterior horizontal or vertical siding. The posts and siding are in ground contact along the bottom edge (see Photo 13).

Floor Framing

At the ground floor level, the flooring is composed of 1x horizontal wood planking spanning between 2x floor joists spaced at approximately 16” on center. The floor joists span between 3x flat girders that are supported by 3x wood posts. The wood posts are either supported directly on grade or sit on a flat wood sleeper that is directly on grade (see Photos 5, 6 and 13). No blocking, hardware or positive connections were observed between the joists, girders and posts. The observable portions of the floor framing appeared in fair condition, with the exception of the moisture damaged framing in contact with the ground.

Shed Roof

There is a shed roof along the south side of the building supported by a 4x4 beam along the top spanning between four wood posts. The wood posts bear directly on grade. A portion of the shed roof is dilapidated and partially collapsed (see Photos 1 and 9).

Seismic Force-Resisting System

The lateral system of the building is not a “codified” system identified under the current building code but has been defined as light-framed (wood) walls rated for shear resistance for the purposes of this assessment. The horizontal lumber roof diaphragm transmits roof horizontal loads to the wood siding walls below. Perimeter walls and one interior wall are present as lateral force-resisting elements, as shown in Figure 4. Some diagonal wood bracing is also present within the crawlspace cripple walls to help resist lateral loads (see Photo 13).

Foundations

The foundations for this structure are limited to wood posts that bear either directly on grade, or on a small wood sleeper on grade. Some posts may be embedded an unknown distance into the ground. Moisture damage was observed at several posts in contact with the ground (see Photos 1, 5, 11, 12 and 13).

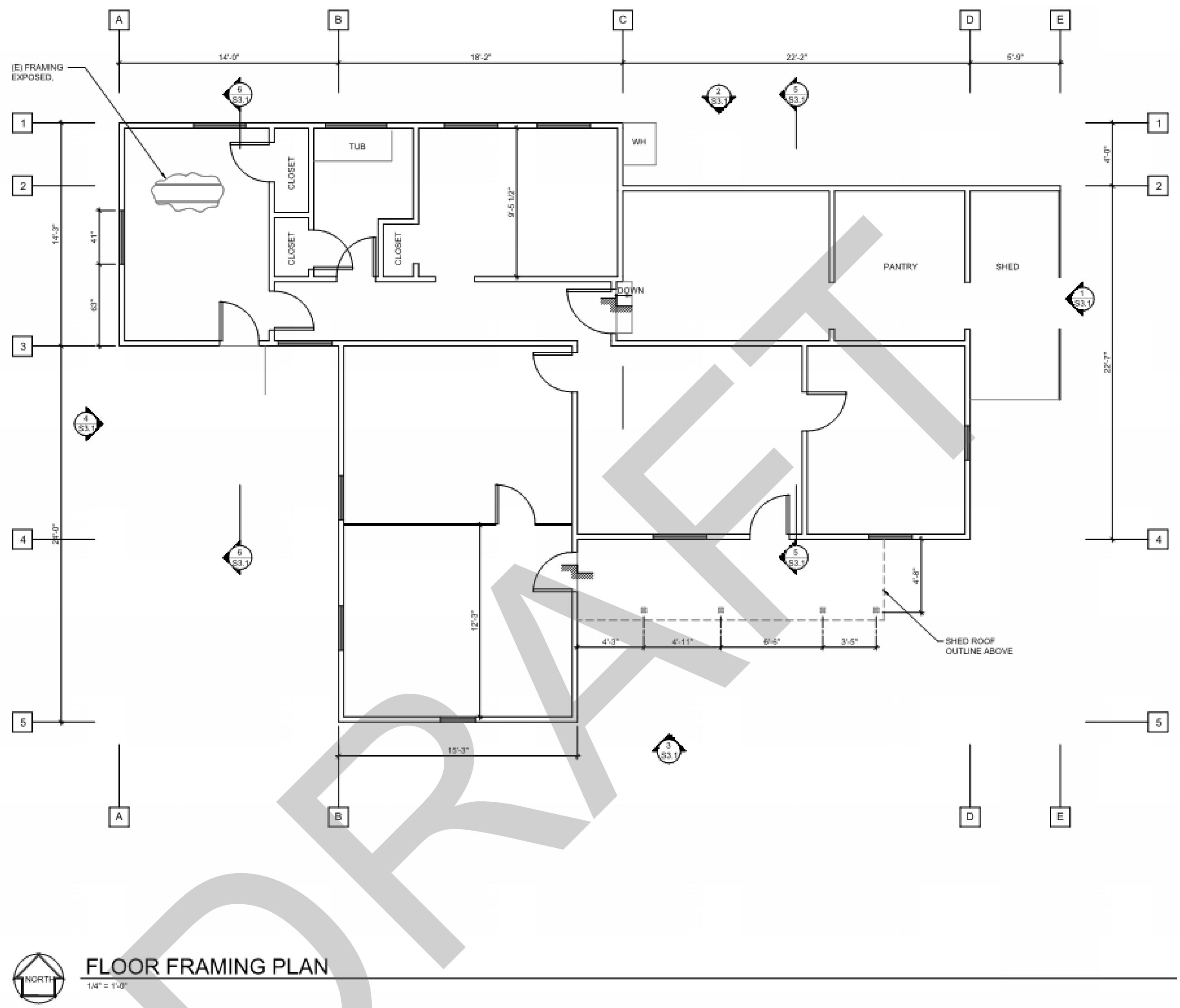


Figure 4: Ground Floor Plan

Material Properties

Basic properties for existing structural materials found on existing building documentation or in accordance with ASCE 41 code prescribed minimum structural values utilized in the analysis calculations can be found in Appendix C.

Photo 1.South elevation, showing shed roof support by posts

Photo 2. East elevation – dilapidated shed shown on the right

Photo 3. West elevation

Photo 4. North elevation shown on the left

Photo 5.Interior crawlspace framing, showing posts bearing on grade or on wood sleepers

Photo 6.Missing siding on exterior wall, and lack of concrete foundation below bearing wall

Photo 7. Missing wood planking at interior floor

Photo 8.Hole in ceiling exposing collar ties, rafters, and 1x planking at roof

Photo 9. Partially collapsed portion of shed roof

Photo 10.Dilapidated shed

Photo 11. Moisture damage at exterior wall

Photo 12. Moisture damage at exterior wall

Photo 13.Crawlspace framing showing lack of concrete foundation, wood posts sitting directly on grade, and diagonal framing at perimeter wall

Building Type

In accordance with ASCE/SEI 41-17, this structure is classified as a **Building Type W1: Wood-Light Frames**, which was used for this evaluation. As described by ASCE/SEI 41-17: *'These buildings are single- or multiple-family dwellings one or more stories high with plan areas less than or equal to 3,000 ft^2. Building loads are light, and the framing spans are short. Floor and roof framing consist of wood joists or rafters on wood studs spaced no more than 24in. apart. The first floor framing is supported directly on the foundation system or is raised up on cripple studs and post-and-beam supports. The foundation is permitted to consist of a variety of elements. Chimneys, where present, consist of solid brick masonry, masonry veneer, or wood frame with internal metal flues. Seismic forces are resisted by wood frame diaphragms and shear-walls. Floor and roof diaphragms consist of straight or diagonal lumber sheathing, tongue-and-groove planks, oriented strand board, plywood, or other materials. Shear walls are permitted to consist of straight or lumber sheathing, plank siding, oriented strand board, plywood, stucco, gypsum board, particleboard, fiberboard, or similarly performing materials. Interior partitions are sheathed from floor to floor with plaster or gypsum board. Older construction often has open-front garages at the lowest story and is permitted to be split-level.'*

Historical Performance

Plywood roof diaphragm and wood framed shear wall systems have traditionally performed relatively well in earthquake events provided adequate shear wall length is maintained without localized stresses in short wall piers and provided there are no significant plan or vertical discontinuities such as a difference in stiffness between floors in a multi-storied structure. Due to the lack of plywood sheathing at the roof and walls, and lack of connections between interconnecting elements, this structure is significantly different than these typical structures and is expected to perform poorly during a significant earthquake.

Benchmark Buildings

In addition to classifying buildings by type of construction, ASCE 41 identifies 'Benchmark Buildings' for each type. The detailing of seismic force-resisting systems in Benchmark Buildings is generally considered to meet the performance requirements of ASCE 41. When a building is determined to meet Benchmark Building requirements through field verification of construction compliant with benchmark code requirements, only review of foundation and non-structural elements is required. The subject building was constructed in the 1860's, well before the benchmark date for this type of construction. Since it does not meet the criteria of a Benchmark Building, a complete Tier 1 analysis is performed.

FINDINGS AND RECOMMENDATIONS

Structural Seismic Deficiencies

The ASCE 41-17 Tier 1 Collapse Prevention and Building Type Specific Checklists indicate the primary building structure as non-compliant in ten (10) areas. These items would all need to be addressed prior to re-occupancy of the building (Alternative 3). General recommendations to address the deficiencies are summarized below; more specific structural scope items are provided in Alternatives 3 of the *BOD Alternatives and Recommended Repair Narrative* section and Appendix B.

a. LOAD PATH: The structure does not contain a complete, well-defined load path, including structural elements and connections, that serve to transfer the inertial forces associated with the mass of all elements of the building to the foundation.
    i. Recommendation: In order to provide a complete seismic force-resisting system, provide the following:
        1. New vertical lateral system such as wood shear walls.
        2. New plywood sheathing on existing roof framing, with blocking along shear wall lines.
        3. New foundations beneath the new lateral system.
b. TIES BETWEEN FOUNDATION ELEMENTS: The foundation does not have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.
    i. Recommendation: Install new concrete foundation elements embedded into the existing grade.
c. SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure is more than 100 lb/ft for straight sheathing.
    i. Recommendation: Install new plywood sheathing on interior face of exterior walls in strategic locations.
d. WALLS are not positively CONNECTED THROUGH FLOORS: Shear walls do not have an interconnection between the ground story walls and crawlspace walls to transfer overturning and shear forces through the floor.
    i. Recommendation: Add new vertical straps or holdowns at ends of new shear walls segments that are connected to foundation elements below.
e. CRIPPLE WALLS, WOOD SILLS and WOOD SILL BOLTS are not present in the crawl space level below first-floor-level shear walls.
    i. Recommendation: Install new cripple wall studs and pressure treated wood sills that are bolted to new concrete foundations.
a) WOOD POSTS: There are no foundations, and therefore no positive connections between wood posts and the foundation.
    i) Recommendation: Provide new foundations with steel hardware connections to existing posts.
f. GIRDER/COLUMN CONNECTION: There is no positive connection using plates, connection hardware, or straps between the girders and the column supports.
    i. Recommendation: Add steel connection hardware at girder and column connections.
g. ROOF CHORD CONTINUITY: All chord elements are not continuous.
    i. Recommendation: Add blocking, nailing and straps at roof chords to provide continuity.

Structural Gravity Deficiencies

a) The structure is founded on wood posts and wood sleepers that sit directly on the soil and show evidence of moisture damage (see Photos 1, 5, 6 and 13). No foundation is present.
   - Recommendation: Provide new foundation around perimeter of structure and under interior posts. Repair deteriorated framing.

b) There are holes in the floors, walls, and ceiling where sheathing is missing or damaged (see Photos 6, 7 and 8).
   - Recommendation: Replace in kind all missing siding, planking, and sheathing.

c) The is a collapsed portion of the shed roof along the south edge of the building (see Photo 9).
   - Recommendation: Replace in kind all damaged roof framing and sheathing, including roofing and waterproofing.

d) The collar ties between the rafters do not appear to be structurally adequate, and there is no ridge beam present to span between the collar ties. (see Photo 8).
   - Recommendation: Reinforce the existing collar ties and provide screwed connections each end. Reinforcement of rafters at collar ties may be required as well. Install 2x ridge blocking that can span between collar ties with steel connection hardware each end.

e) The existing 3x (flat) floor girders do not appear to be structurally adequate (see Photo 13).
   - Recommendation: Reinforce all floor girders with pressure treated 2x8 sistered onto each side with screwed connections.

f) The framed shed on the east side of the home is derelict and not stable (see Photos 2 and 10).
   - Recommendation: Complete removal of shed.

BOD Alternatives and Recommended Repair Narrative:

Recommendations for the following alternatives are also shown in the conceptual structural drawings in Appendix A of this report.

BASIS OF DESIGN ALTERNATIVE #1: Retain structure in current state. Address public safety issues and restrict perimeter access to the structure; structure remains visible from a distance and can be interpreted from a distance. Under this option the structure could not be occupied. (See drawing 1-S2.1)

1) Install a secure fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Along the north side of the building, the fence will likely be required to be closer to the building (approximately 10 feet away) due to the steep slope conditions. Several trees will be within the fence perimeter and will require coordination with the *Tree Protection Plan* during installation. Assume two gated locations for maintenance personnel access. Install signage at building and entry gates.
2) Additional factors may need to be considered regarding the recommended lifespan of this option.

BASIS OF DESIGN ALTERNATIVE #2: Stabilize the structure and site access routes for perimeter and exterior viewing by the public. Under this alternative, the structure can be viewed up close with interpretation information adjacent to the structure.

The recommended stabilization methods specifically target only the gravity related structural deficiencies and would not allow for re-occupancy of the building. The settled portions of the structure would not be required to be lifted back to their original (level) position, and the stabilization and shoring elements should be assumed to be left permanently in place until further remediation measures can be implemented. (See drawings 2-S2.1 & 2-S2.2)

1) Install pressure treated wood cribbing or shims to shore all post and bearing wall locations around perimeter that have observable moisture damage or are no longer in contact with the grade below. Stabilization shoring installed in a minimum 2x pattern per Corp of Engineers (or equivalent) is recommended for the cribbing shores.
2) All failed or failing portions of the existing shed roof along the south should be repaired, replaced in-kind or demolished entirely where permissible to minimize area required to be maintained by the District.
3) The dilapidated shed at the northeast corner should be dismantled and removed.
4) Diagonal 2x8 wood bracing with screwed connections should be installed on the interior face of the exterior walls and at cripple walls directly below (assume 10 linear feet along each exterior wall – 100 linear feet total).
5) Under this option, if it's not desirable for the perimeter access to the site to be fenced in per Alternative 1, it is recommended that all 17 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with ¾" plywood rated for exterior exposure positively anchored with galvanized fasteners. This plywood should be assumed to be painted to match existing exterior wall color to minimize the visual impact of this option.
6) Follow the *Mothballing Guidelines* including:
    a. Secure the building and its component features to reduce vandalism or break-ins.
    b. Remove furnishings, trash and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
    c. Provide adequate ventilation to the interior.
    d. Secure or modify utilities and mechanical systems.
    e. Develop and implement a maintenance and monitoring plan for protection.

BASIS OF DESIGN ALTERNATIVE #3: Repair and rehabilitate the structure for reuse as a limited use retreat space.

The stabilization methods proposed for this alternative target all code and safety concerns as specifically identified in the condition assessment to allow for re-occupancy of the building. For cost estimation purposes, it is assumed necessary to bring all elements of the unpermitted structure up to the current historical building code (2016 or 2019 California Historical Building Code) to allow for re-occupancy of the existing building. It is assumed there is no change of occupancy from the existing. (See drawings 3-S2.1 - 3-S2.2)

- New concrete foundation:
    a. Install new 18-inch wide by 24-inch deep shallow strip footing around perimeter of the building that extends a minimum of 6" above grade. See geotechnical report for requirements. Assume 250 linear feet of continuous footing.
    b. Install new 24-inch square by 30-inch deep spread footings under existing posts. See geotechnical report for requirements. Spread footings to extend a minimum of 6" above grade. Assume 20 spread footings.
    c. The foundation can be installed in sections in a "hit and miss" sequence to avoid the need to shore the entire structure simultaneously.
    d. Assume existing floor sheathing and framing will be removed and replaced after foundation installation.

- Crawlspace framing:
    a. Replace all interior crawlspace posts with new 4x4 wood posts with connection hardware at top and bottom.
    b. Install 2x4 wood cripple wall studs at 16" on center at entire perimeter crawlspace wall, that will bear on a 3x4 pressure treated wood sill bolted to the new footing. Install ½" exterior grade plywood on interior face of studs around entire perimeter of building – assume 200 linear feet. Install new siding on exterior face of new cripple wall to match existing.

- Roof framing:
    a. Replace the existing 1x roof planking with 5/8" thick plywood sheathing over entire roof surface (approximately 1,800 square ft). Provide allowance for repair/replacement of 20% of roof framing.
    b. Install 2x ridge boards that span between existing rafters along length of ridges with connection hardware each end.
    c. Install 2x blocking between existing rafters around perimeter of building at exterior and interior bearing walls.
    d. Reinforce existing collar ties with new collar ties with screwed connections each end.
    e. All failed or failing portions of the existing shed roof along the south should be repaired or demolished and replaced in-kind.
    f. Provide new roofing and underlayment over entire roof.
- Wall framing:
    a. Install plywood sheathing on interior face of existing perimeter walls (assume 10 linear feet along each exterior wall – 100 feet total). Sheathing to be installed over new full height 2x4 studs at 16" on center laid flat against interior face of existing siding. Install vertical straps or holdowns between studs at ends of each segment that are fastened to posts aligned directly below in cripple wall.
    b. Replace all missing or damaged exterior 1x wall siding and battens in kind – assume 150 square feet.
- Floor framing:
    a. Replace all missing or damaged 1x floor planking in kind – assume 50 square feet.
    b. Install steel framing clips for positive connection between existing floor joists, girders, and posts.
    c. Reinforce all floor girders with pressure treated 2x8 joists sistered onto each side with screwed connections.
- The dilapidated shed at the northeast corner, which appears to not be part of the original construction, should be dismantled and removed.
- Optional: Install motion activated cameras and signage at the site as an additional security measure; additional maintenance costs for these measures should be considered.

BASIS OF DESIGN ALTERNATVE #4: Remove the structure and restore the underlying natural resource values.

For cost estimation purposes, the complete demolition of the structure, its foundations and site elements assuming that demolition would likely follow a more typical process for permitting and contracting the demolition work. Assume 30 tons of wood materials would need to be removed from the site. (See drawing 4-S2.1)

- Removal of all hazardous materials prior to demolition of the building (See Exhibit D).
- The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.
- Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.
- The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.
- Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this alternative is dependent upon regulatory approval process.

RELIABILITY OF SEISMIC EVALUATIONS

In general, structural engineers do not have the ability to predict the exact damage to a building as a result of an earthquake. There will be a wide variation of damage from building to building due to the variations in ground motion and varying types and quality of construction. In addition, engineers cannot predict the exact ground motions of the earthquake that may strike a given building. Design and evaluation of buildings are performed using general guidelines and information from past earthquakes. Engineers and the codes used for design and evaluation have been conservative when attempting to ensure that building design meets minimum standards of Collapse Prevention. This effort is based on science and technology as well as on observations made from actual seismic events. Building design and evaluation codes are constantly evolving to better meet performance targets based on this information. Continued research will improve predictive methods and facilitate performance-based engineering. It has been estimated that, given design ground motions, a small percent of new buildings and a slightly greater percent of retrofit buildings may fail to meet their expected performance.

CLOSING

The structural condition assessment, seismic review, analysis and BOD associated with this evaluation were based on the site review of framing and elements of the building which are plainly visible. No attempt was made to uncover hidden conditions or perform any destructive or non-destructive testing. The items discussed in this report are subject to revision should more information become available.

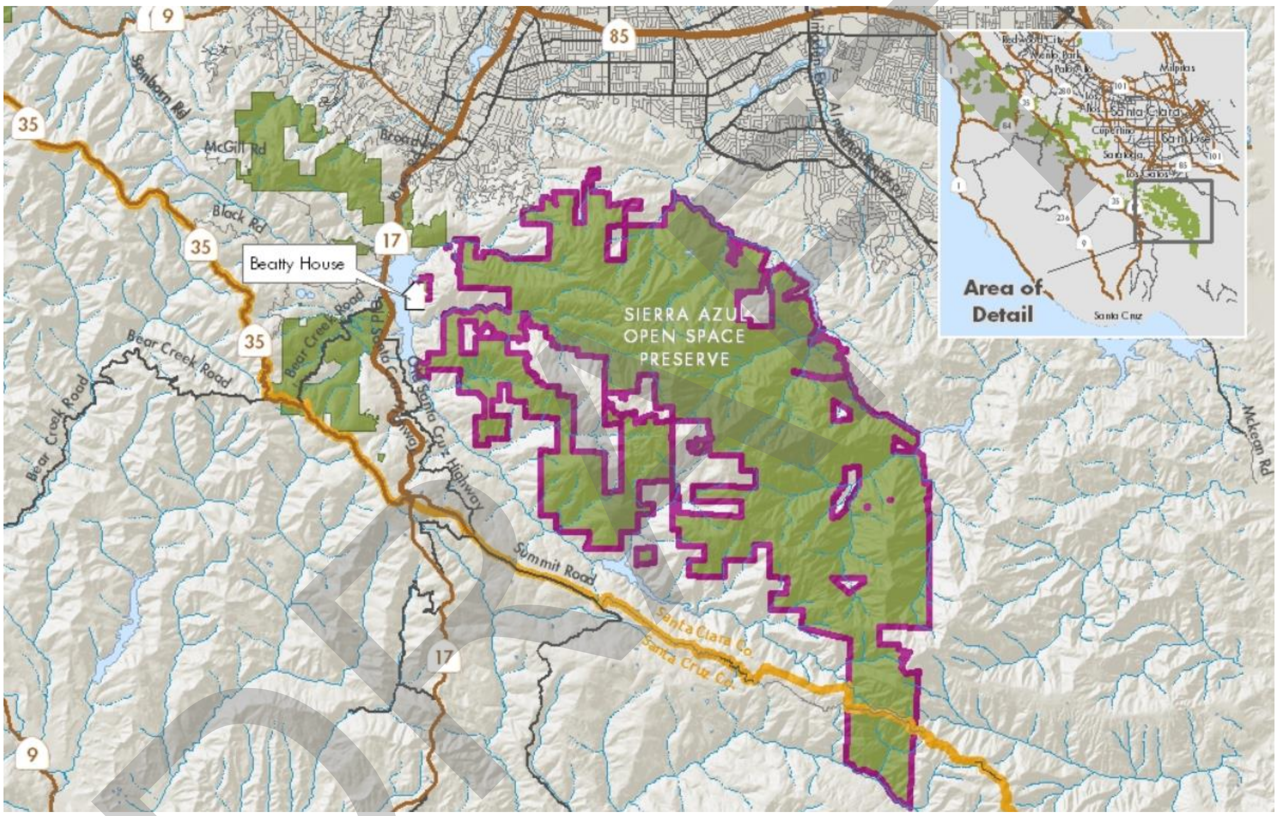
This report is general in nature and does not imply that the recommendations listed above are the only structural requirements that must be made to the existing structure to meet current code criteria.

We understand you may have questions regarding this evaluation and are available for comment and explanations. Please call with any questions you may have. Thank you for choosing ZFA Structural Engineers to assist you with this building seismic and structural stabilization review.

Steven Patton, SE
Senior Associate

Mark Moore, SE
Executive Principal

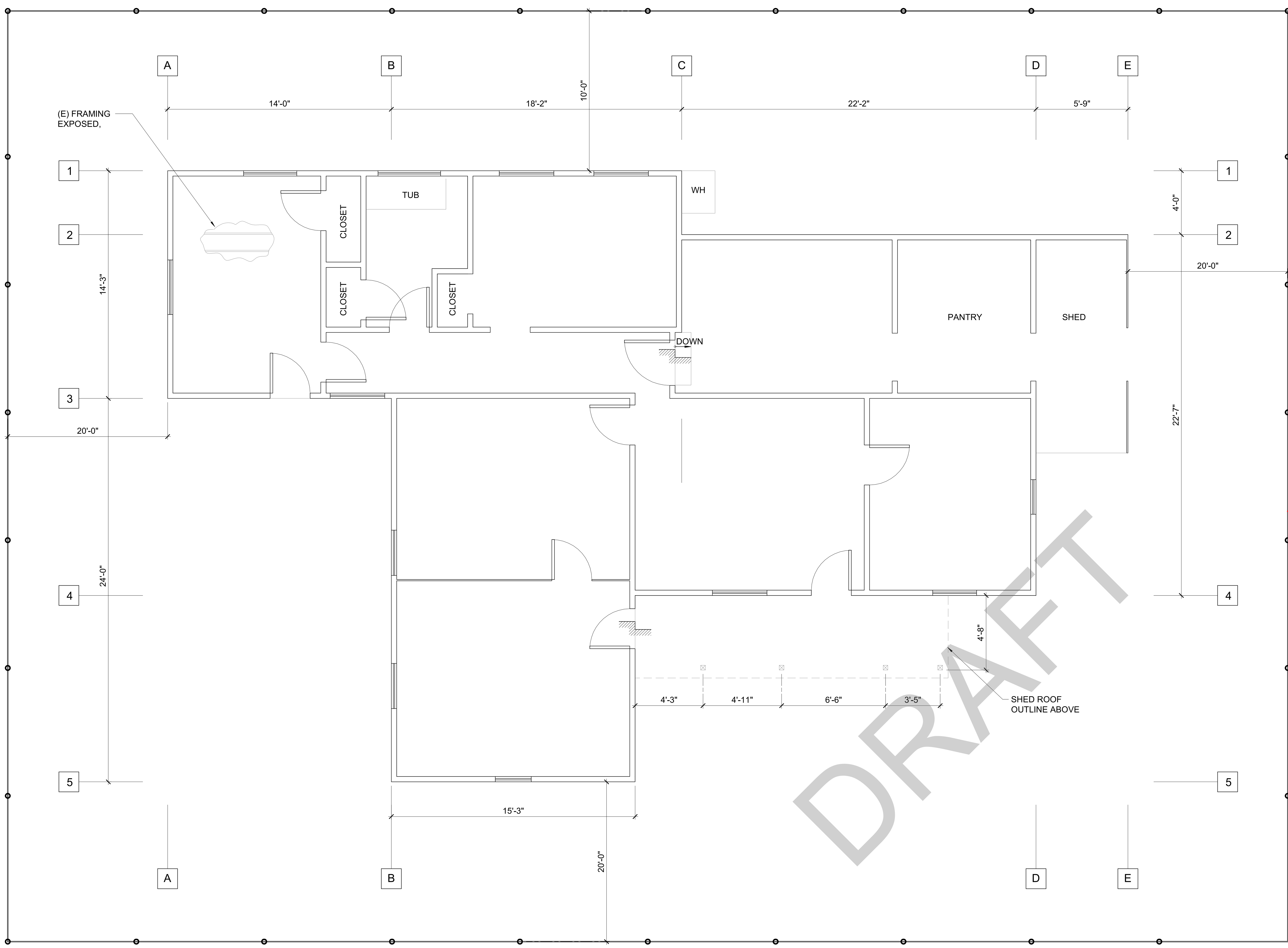
APPENDIX A – SITE MAP


Beatty House
SIERRA AZUL
OPEN SPACE
PRESERVE
Area of
Detail
Summit Road
Santa Clara Co.
Santa Cruz Co.
Bear Creek Road
Black Rd
McGill Rd
Sanborn Rd
Old Santa Cruz Highway
Mckean Rd
85
17
35
9

APPENDIX B – STRUCTURAL STABILIZATION BASIS OF DESIGN ALTERNATIVES

Revision Schedule

#	Revision Description	Date



NORTH

FLOOR FRAMING PLAN BOD OPTION 1

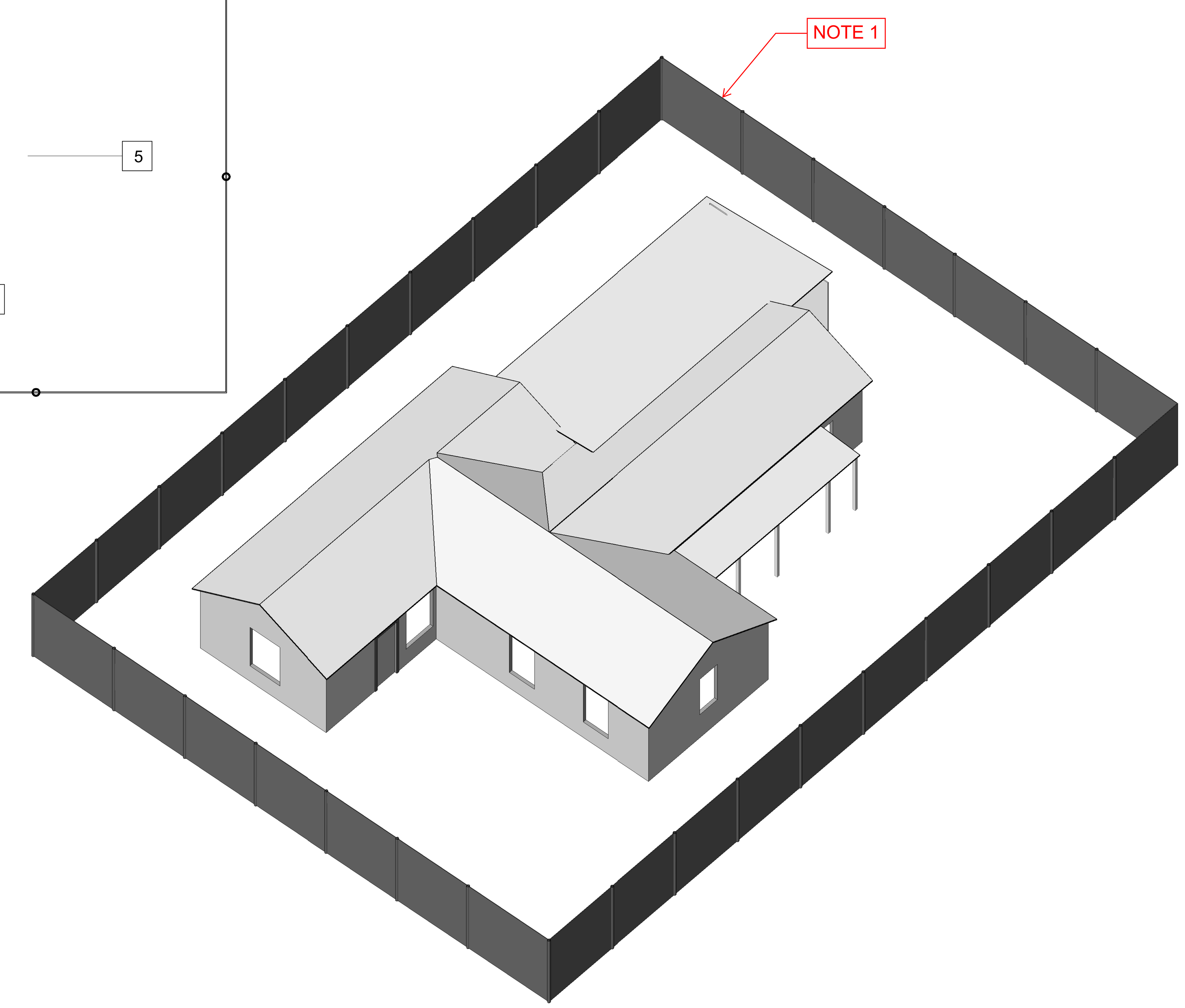
1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 1

1) Install a secure fence, a minimum of 8-foot-tall above grade, around the perimeter of the building. Assume standard pipe columns cast a minimum of 24" into 8" diameter concrete piers. The cost estimate assumes a chain link fence; other fence materials could be explored with the District's guidance. The length of fencing is approximately 400 lineal feet and is recommended to be at least 20 feet from the perimeter of the building and porches to provide a safety "buffer" space in case collapse of the framing occurs in the future. Along the north side of the building, the fence will likely be required to be closer to the building (approximately 10 feet away) due to the steep slope conditions. Several trees will be within the fence perimeter and will require coordination with the Tree Protection Plan during installation. Assume two gated locations for maintenance personnel access.

2) Remove the existing Redwood tree and Laurel tree that are in poor condition. Prune the Oak trees as outlined in Tree Protection Plan in Arborist report by Kielty Arborist Services (See Exhibit H)

3) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISO VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Sierra_Beatty Home_S19C_leos@zfa.com.rvt

11/22/2019 2:07:20 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 1
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

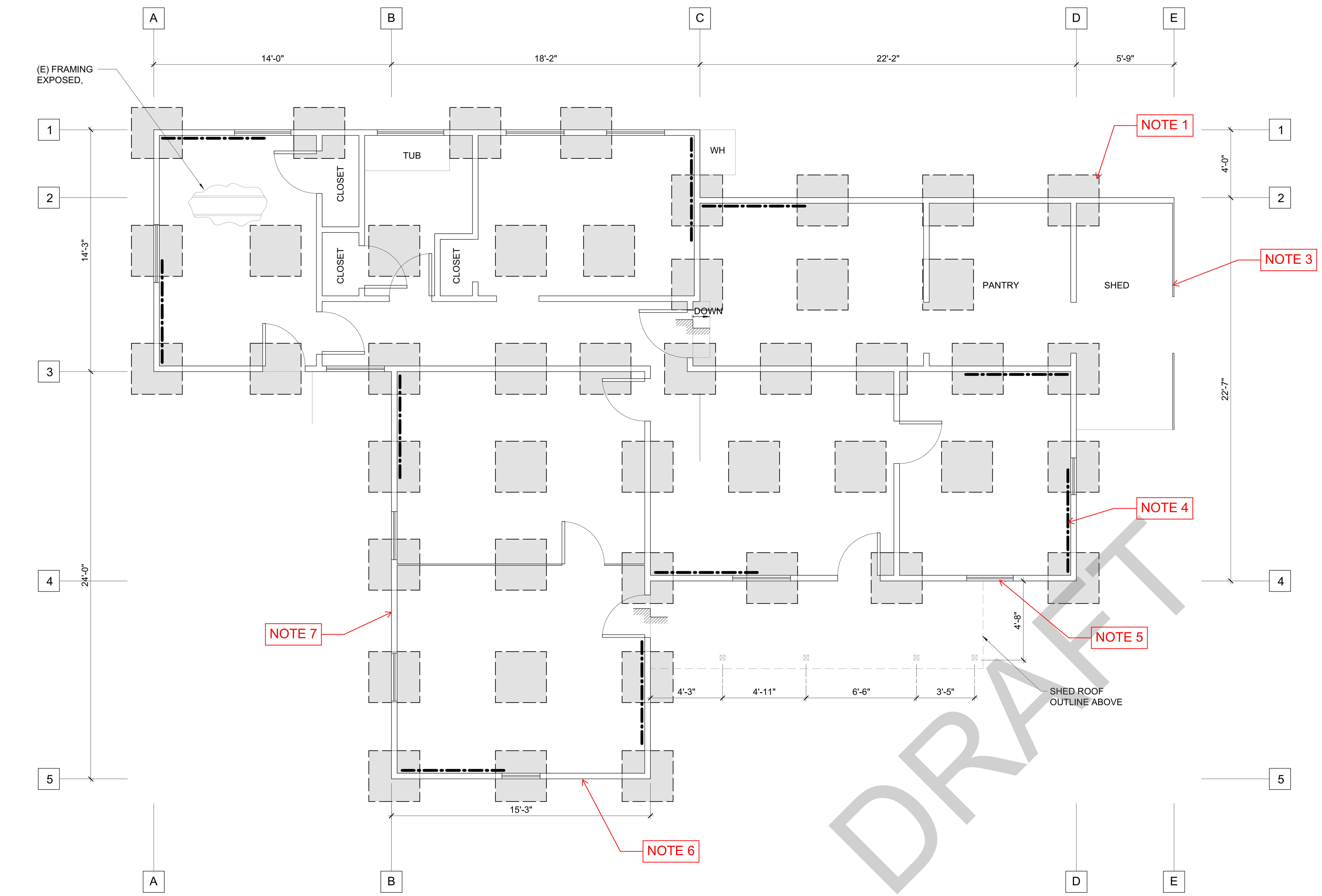
SHEET DESCRIPTION

EXISTING FLOOR PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

1-S2.1



FLOOR FRAMING PLAN BOD OPTION 2

1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 2

1) Install pressure treated wood cribbing or shims to shore all post and bearing wall locations around perimeter that have observable moisture damage or are no longer in contact with the grade below. Stabilization shoring installed in a minimum 2x pattern per Corp of Engineers (or equivalent) is recommended for the cribbing shores.

2) All failed or failing portions of the existing shed roof along the south should be repaired, replaced in-kind or demolished entirely where permissible to minimize area required to be maintained by the District.

3) The dilapidated shed at the northeast corner, which appears to not be part of the original construction, should be dismantled and removed.

4) Diagonal 2x8 wood bracing with screwed connections should be installed on the interior face of the exterior walls and at cripple walls directly below (assume 10 linear feet along each exterior wall – 100 linear feet total).

5) Under this option, if it is not desirable for the perimeter access to the site to be fenced in per Option 1, it is recommended that all 17 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.

6) Remove peeling, loose lead-containing paint from the exterior. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to match the original color.

7) Areas and/or elements of the building envelope that are deteriorated beyond repair should be replaced in-kind to match the original elements and construction techniques. Character-defining features such as the board-and batten siding, wood windows, and wood doors in particular should be repaired so that the building can best convey its historic form and significance.

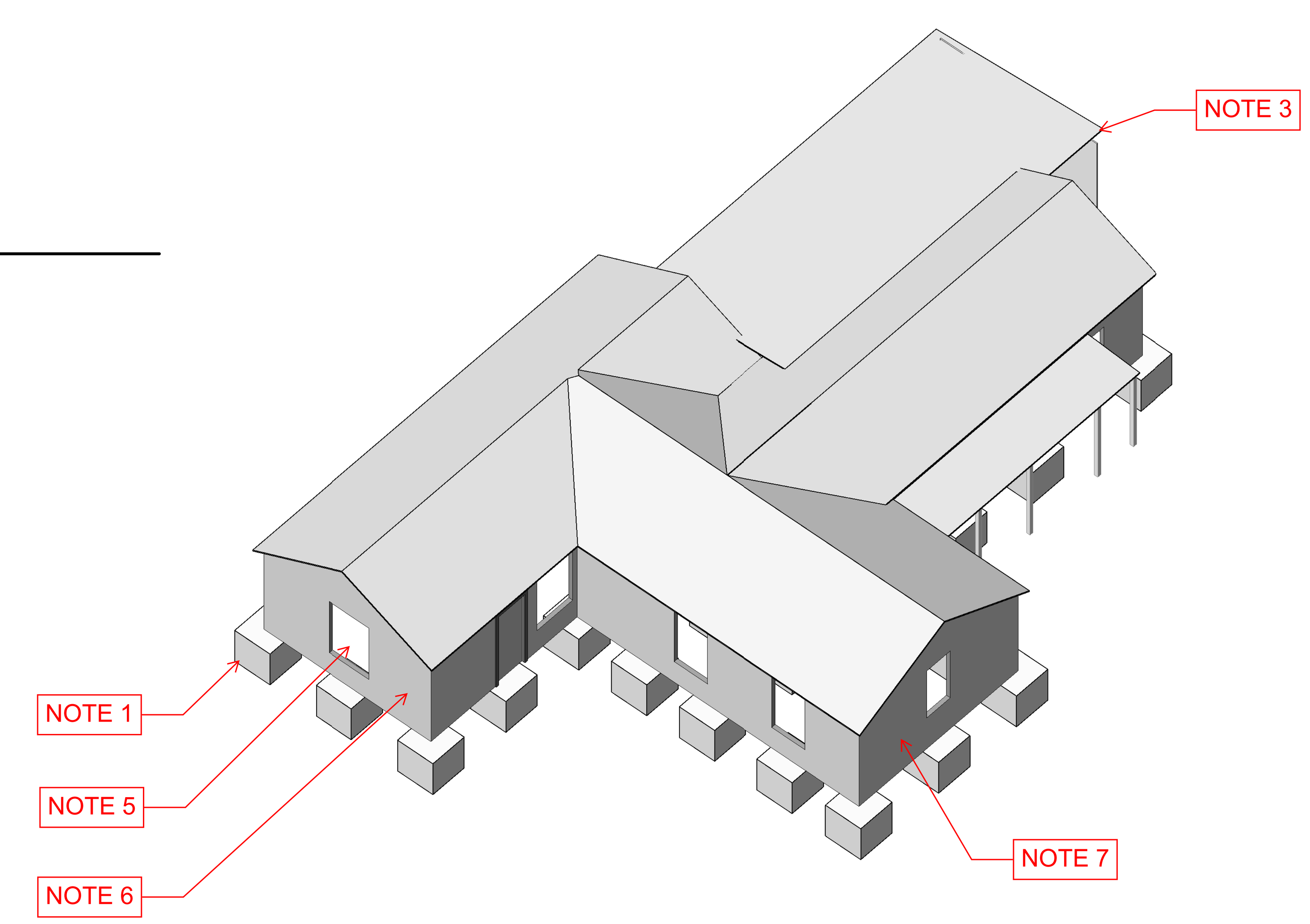
8) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a.Secure the building and its component features to reduce vandalism or break-ins.
b.Remove furnishings, trash and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
c.Provide adequate ventilation to the interior.
d.Secure or modify utilities and mechanical systems.
e.Develop and implement a maintenance and monitoring plan for protection, including

9) Remove the existing Redwood tree and Laurel tree that are in poor condition. Prune the Oak trees as outlines in Tree Protection Plan is outlined in Arborist report by Kielty Arborist Services (See Exhibit H)

10) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

11) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

12) Nesting bird surveys are required if work takes place between February 15 and August 30



1 3D ISO VIEW

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 2
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

SHEET DESCRIPTION

EXISTING FLOOR PLAN

ENGR: SRP
DATE: NOV 22, 2019
PM: SRP

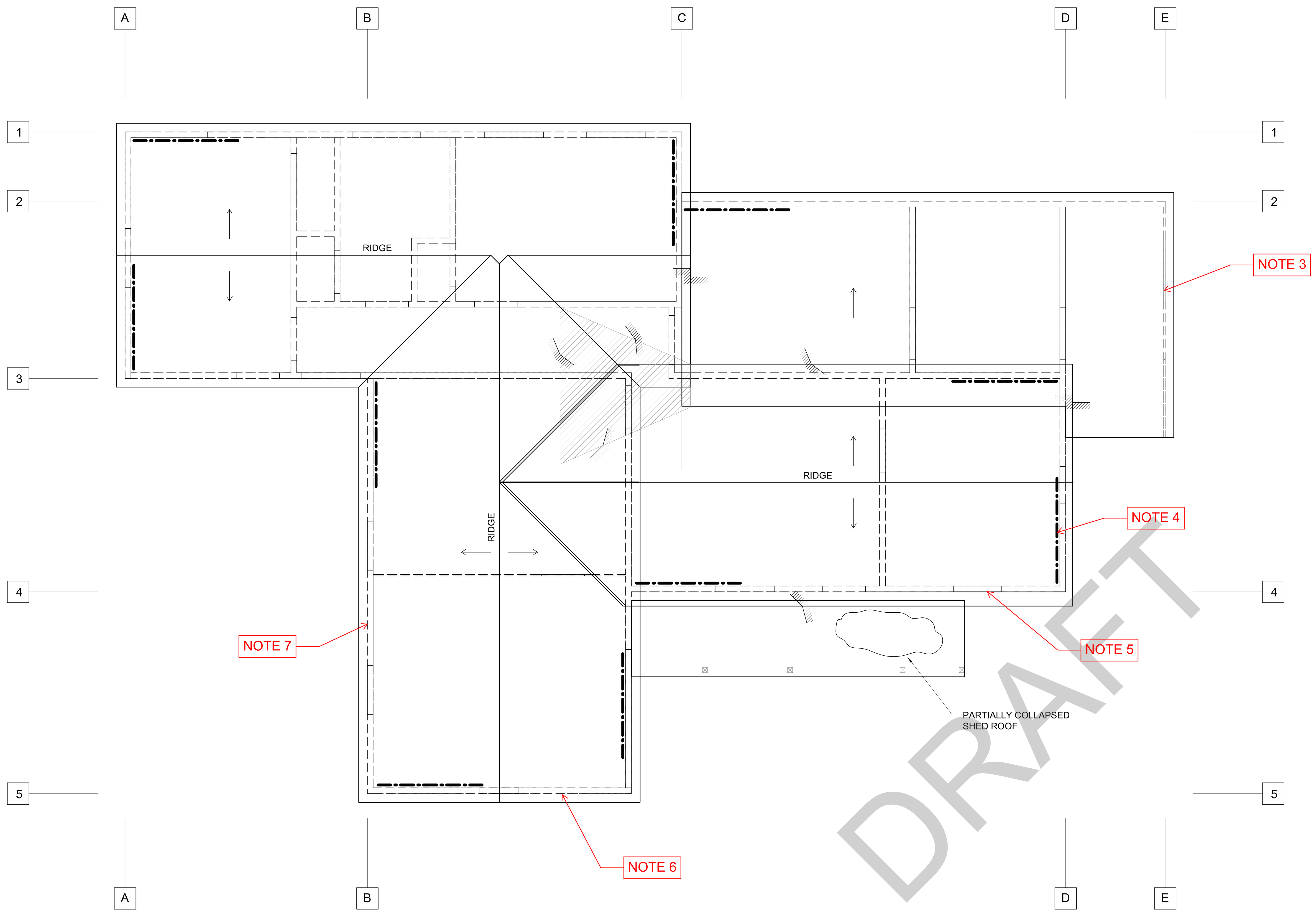
SHEET

2-S2.1

C:\revit_local\R2019\19235_Sierra_Beatty Home_S18C_leos@zfa.com.rvt

11/22/2019 2:07:23 PM

PRINT TO 11x17



NORTH

ROOF FRAMING PLAN BOD OPTION 2

1/4" = 1'-0"

BASIS OF DESIGN: ALTERNATIVE 2

1) Install pressure treated wood cribbing or shims to shore all post and bearing wall locations around perimeter that have observable moisture damage or are no longer in contact with the grade below. Stabilization shoring installed in a minimum 2x pattern per Corp of Engineers (or equivalent) is recommended for the cribbing shores.

2) All failed or failing portions of the existing shed roof along the south should be repaired, replaced in-kind or demolished entirely where permissible to minimize area required to be maintained by the District.

3) The dilapidated shed at the northeast corner, which appears to not be part of the original construction, should be dismantled and removed.

4) Diagonal 2x8 wood bracing with screwed connections should be installed on the interior face of the exterior walls and at cripple walls directly below (assume 10 linear feet along each exterior wall – 100 linear feet total).

5) Under this option, if it is not desirable for the perimeter access to the site to be fenced in per Option 1, it is recommended that all 17 existing glazed openings and doors around the exterior of the building should be assumed to be permanently covered with clear Lexan to allow for viewing of the historic interior.

6) Remove peeling, loose lead-containing paint from the exterior. Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1) and with the EPA Renovation, Repair and Painting (RRP) Rule. Repaint the exterior to match the original color.

7) Areas and/or elements of the building envelope that are deteriorated beyond repair should be replaced in-kind to match the original elements and construction techniques. Character-defining features such as the board-and batten siding, wood windows, and wood doors in particular should be repaired so that the building can best convey its historic form and significance.

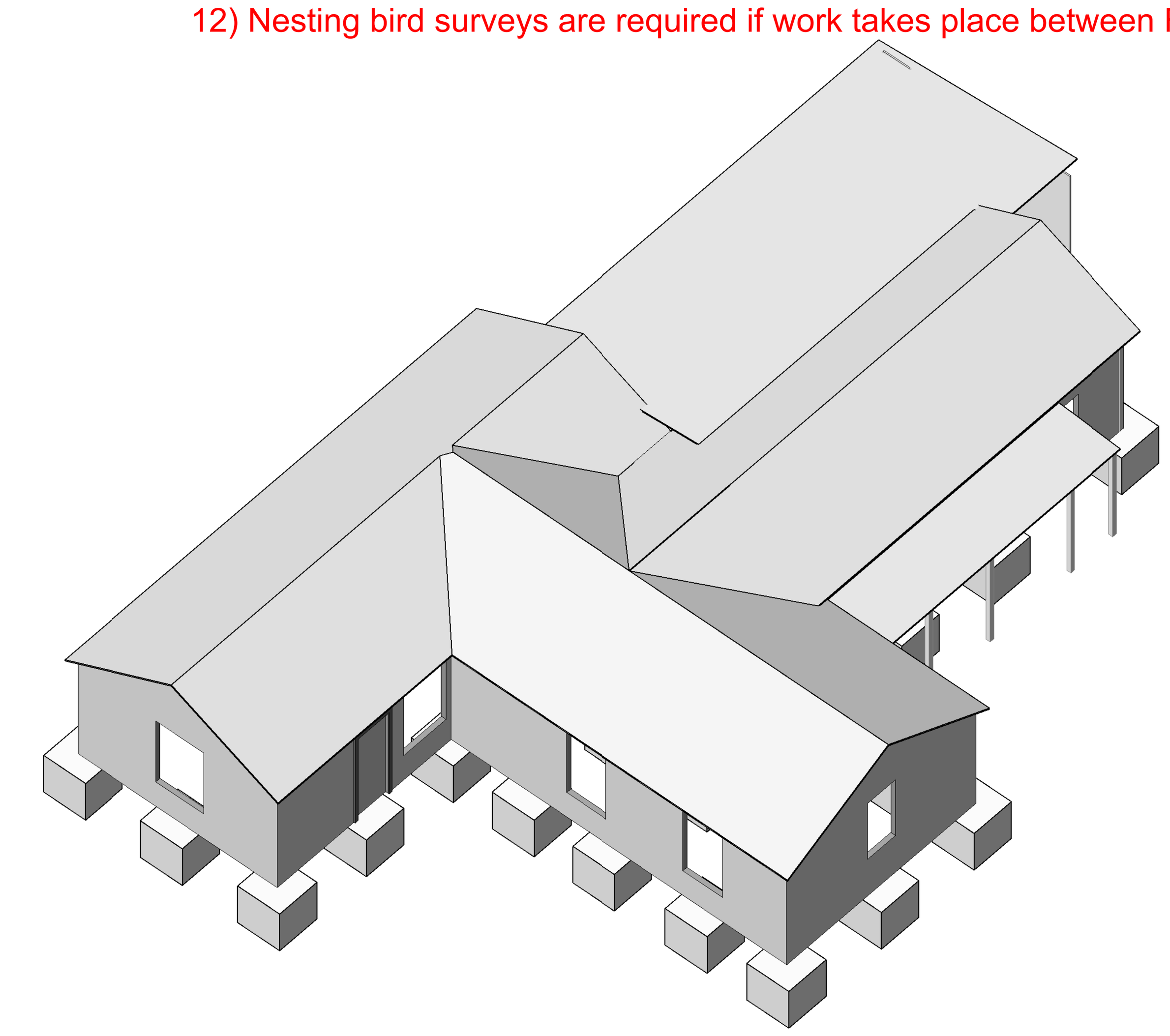
8) Follow the Mothballing Guidelines outlined in Exhibit G, including:
a.Secure the building and its component features to reduce vandalism or break-ins.
b.Remove furnishings, trash and stored hazardous materials (i.e. poisons, paints, etc) and ensure it is broom-clean.
c.Provide adequate ventilation to the interior.
d.Secure or modify utilities and mechanical systems.
e.Develop and implement a maintenance and monitoring plan for protection, including

9) Remove the existing Redwood tree and Laurel tree that are in poor condition. Prune the Oak trees as outlines in Tree Protection Plan is outlined in Arborist report by Kielty Arborist Services (See Exhibit H)

10) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

11) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

12) Nesting bird surveys are required if work takes place between February 15 and August 30.



2 3D ISO VIEW

C:\revit_local\R2019\19235_Sierra_Beatty Home_S19C_leos@zfa.com.rvt

11/22/2019 2:07:27 PM

PRINT TO 11x17

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 3

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869
copyright © 2019

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 2
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

SHEET DESCRIPTION

EXISTING ROOF PLAN

ENGR: SRP	DATE: NOV 22, 2019
PM: SRP	

SHEET

2-S2.2

BASIS OF DESIGN: ALTERNATIVE 3

1) While the Beatty Property Home is currently unoccupied, the Basis of Design assumes that the current occupancy is classified as Residential and is proposed to be used as a limited retreat. The maximum occupancy of the structure was not investigated but assumed to be (5) based on the number of bedrooms.

2) Provide new structural members including:
a) New concrete foundation: perimeter strip footing, interior strip footing, interior spread footings
b) Crawlspace framing: replace existing interior posts, install perimeter cripple wall studs and plywood wall sheathing.
c) Roof framing: replace existing planking with plywood sheathing, install new ridge boards and blocking, reinforce existing collar ties, replace failed members in kind, install new roofing.
d) Wall framing: install plywood wall sheathing on interior at portions of perimeter wall, install new perimeter stud wall framing at portions of perimeter wall, install holdowns at new plywood wall segment ends
e) Floor framing: replace missing or damage floor planking, install framing hardware, reinforce existing floor girders

3) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

4) Dismantle and remove the dilapidated shed at the northeast corner, which appears to not be part of the original construction.

5) Remove the asbestos-containing material and lead-containing paint in accordance with provisions specified in the Asbestos and Lead Survey (Exhibit D).

6) In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Option 2, the following work should be anticipated for cost estimation purposes:
a) Upgrade and reconnect plumbing and electrical service.
b) Construct a new septic and potable water system. A well was observed approximately 200 feet southeast of the building but was not investigated and consumption safety is uncertain. The well will require testing to determine continued use.
c) Install new flooring and toilet, lavatory, and shower/bath in the bathroom.
d) Assuming a functional kitchen is desired for the new uses, install new cabinetry, a new sink and fixtures, and a new oven and stove.

7) Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.

8) A formal accessibility review was not part of the scope of this investigation; however, the following items were not compliant with the Building Code and should thoughtfully be designed for to not compromise the character-defining features of the building:
a) None of the existing doors are level with exterior grade
b) Clear space at building doors is less than the 29-1/2" allowed by Code
c) There are multiple level changes of at least one step inside the building

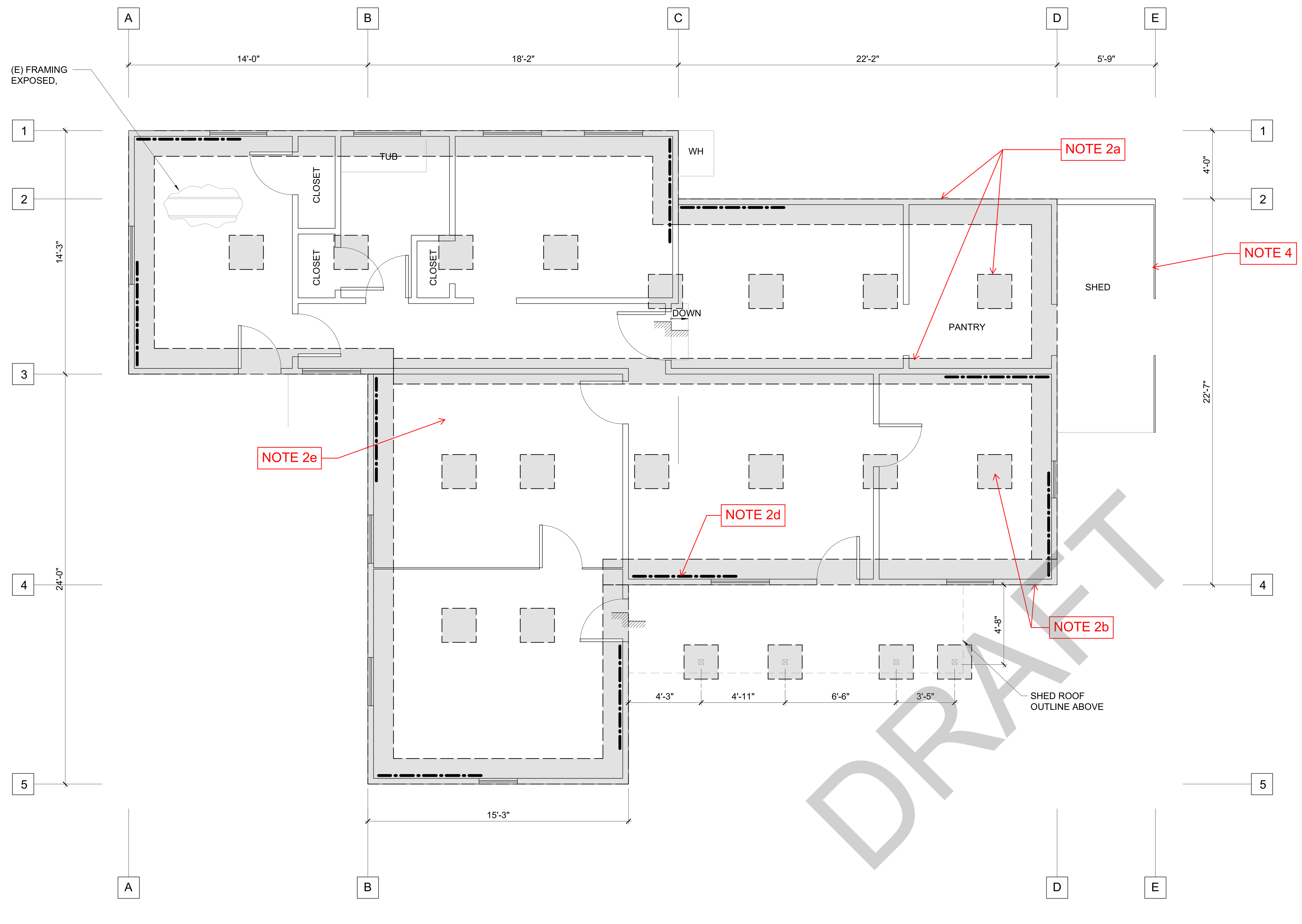
9) Remove the existing Redwood tree and Laurel tree that are in poor condition. Prune the Oak trees as outlines in Tree Protection Plan is outlined in Arborist report by Kielty Arborist Services (See Exhibit H).

10) Remove wildlife waste products.

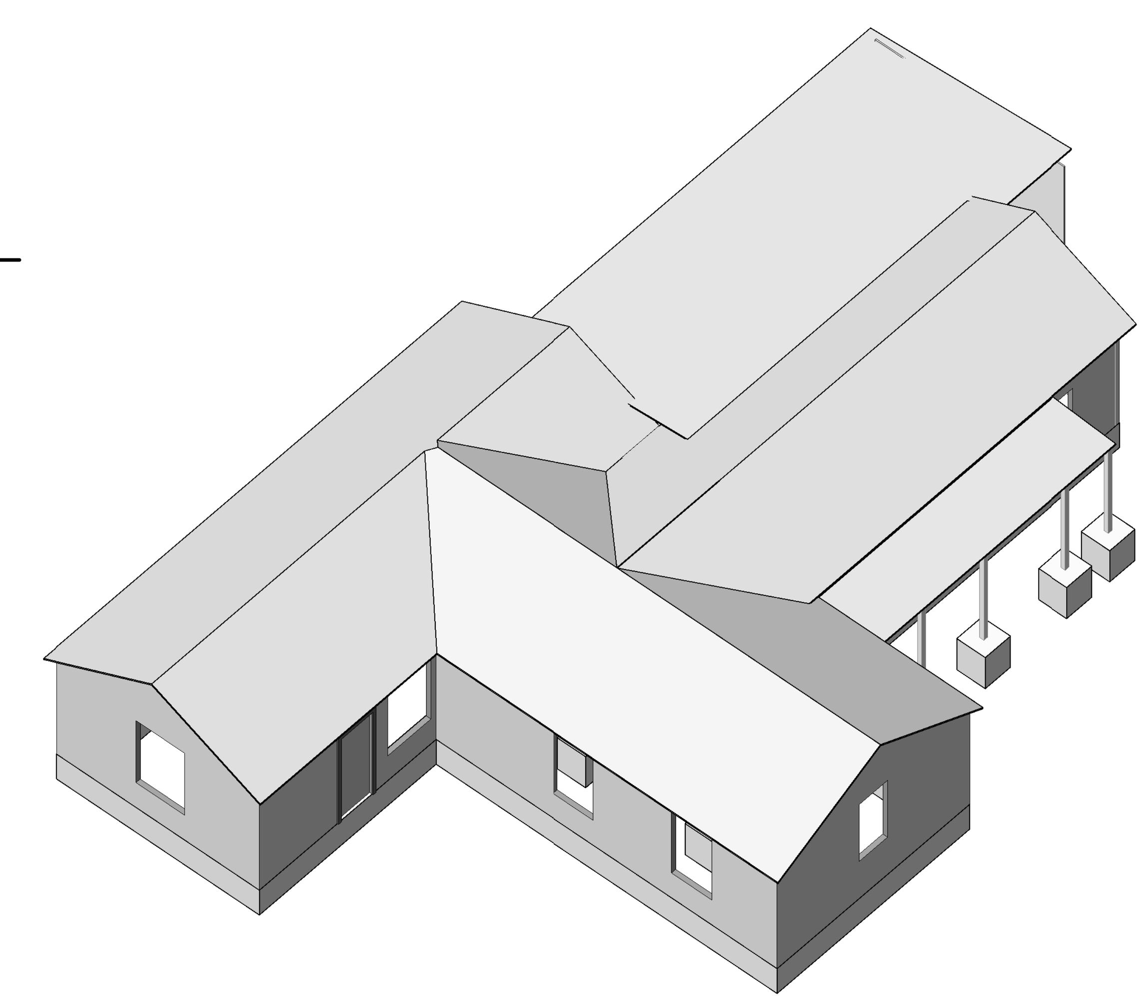
11) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

12) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

13) Nesting bird surveys are required if work takes place between February 15 and August 30



FLOOR FRAMING PLAN BOD OPTION 3
1/4" = 1'-0"



2 3D ISO VIEW

PRINT TO 11x17

C:\revit_local\R2019\19235_Sierra_Beatty Home_S19C_leos@zfa.com.rvt

11/22/2019 2:07:30 PM

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Attachment 3

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 3
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

SHEET DESCRIPTION

EXISTING FLOOR PLAN

ENGR: SRP
DATE: NOV 22, 2019
PM: SRP

SHEET

3-S2.1

Attachment 3

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235
zfa.com
650.394.8869

BASIS OF DESIGN: ALTERNATIVE 3

1) While the Beatty Property Home is currently unoccupied, the Basis of Design assumes that the current occupancy is classified as Residential and is proposed to be used as a limited retreat. The maximum occupancy of the structure was not investigated but assumed to be (5) based on the number of bedrooms.

2) Provide new structural members including:
a) New concrete foundation: perimeter strip footing, interior strip footing, interior spread footings
b) Crawlspace framing: replace existing interior posts, install perimeter cripple wall studs and plywood wall sheathing.
c) Roof framing: replace existing planking with plywood sheathing, install new ridge boards and blocking, reinforce existing collar ties, replace failed members in kind, install new roofing.
d) Wall framing: install plywood wall sheathing on interior at portions of perimeter wall, install new perimeter stud wall framing at portions of perimeter wall, install holdowns at new plywood wall segment ends
e) Floor framing: replace missing or damage floor planking, install framing hardware, reinforce existing floor girders

3) Secretary of the Interior's Standards are the most appropriate basis for this proposed project alternative.

4) Dismantle and remove the dilapidated shed at the northeast corner, which appears to not be part of the original construction.

5) Remove the asbestos-containing material and lead-containing paint in accordance with provisions specified in the Asbestos and Lead Survey (Exhibit D).

6) In addition to the general repairs that would be required to address the deterioration of various building components noted in the Conditions Assessment and the repair work described in Option 2, the following work should be anticipated for cost estimation purposes:
a) Upgrade and reconnect plumbing and electrical service.
b) Construct a new septic and potable water system. A well was observed approximately 200 feet southeast of the building but was not investigated and consumption safety is uncertain. The well will require testing to determine continued use.
c) Install new flooring and toilet, lavatory, and shower/bath in the bathroom.
d) Assuming a functional kitchen is desired for the new uses, install new cabinetry, a new sink and fixtures, and a new oven and stove.

7) Additional annual maintenance costs will include, but is not limited to, access maintenance, utilities (power, trash, etc.), pest and rodent management, tree maintenance, security and insurance.

8) A formal accessibility review was not part of the scope of this investigation; however, the following items were not compliant with the Building Code and should thoughtfully be designed for to not compromise the character-defining features of the building:
a) None of the existing doors are level with exterior grade
b) Clear space at building doors is less than the 29-1/2" allowed by Code
c) There are multiple level changes of at least one step inside the building

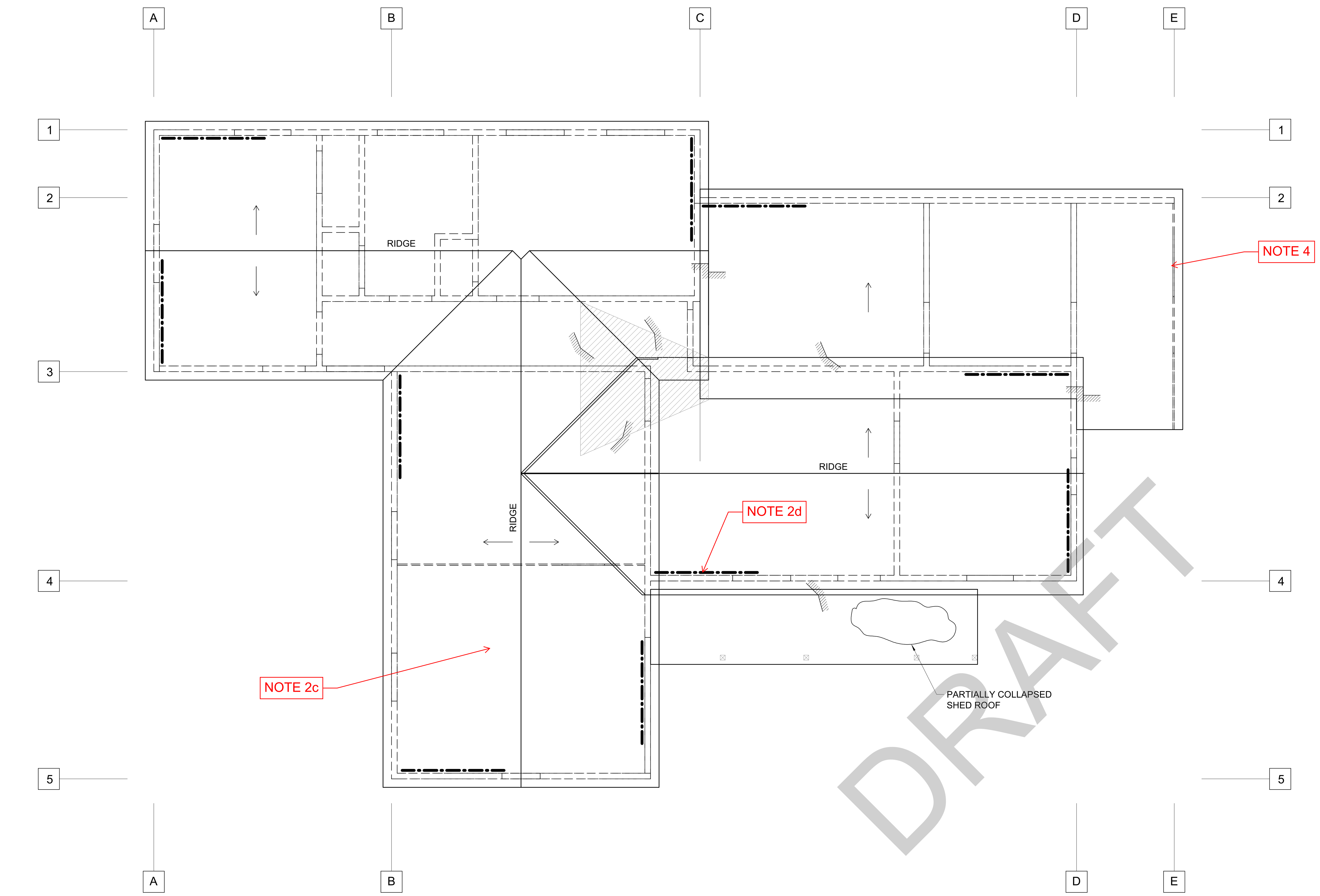
9) Remove the existing Redwood tree and Laurel tree that are in poor condition. Prune the Oak trees as outlines in Tree Protection Plan is outlined in Arborist report by Kielty Arborist Services (See Exhibit H).

10) Remove wildlife waste products.

11) Develop a bat roost deterrent plan, including a replacement bat maternity roost habitat, for approval by the California Department of Fish and Wildlife (CDFW), and follow the general bat and woodrat avoidance measures (see Exhibit E).

12) Optional: Install motion activated cameras and signage at the site as an additional security measure; include additional maintenance costs for these measures. If internet or cellular service is unavailable, a motion activated camera system may be installed that stores footage on site that may be accessed by District staff in the event of security concerns.

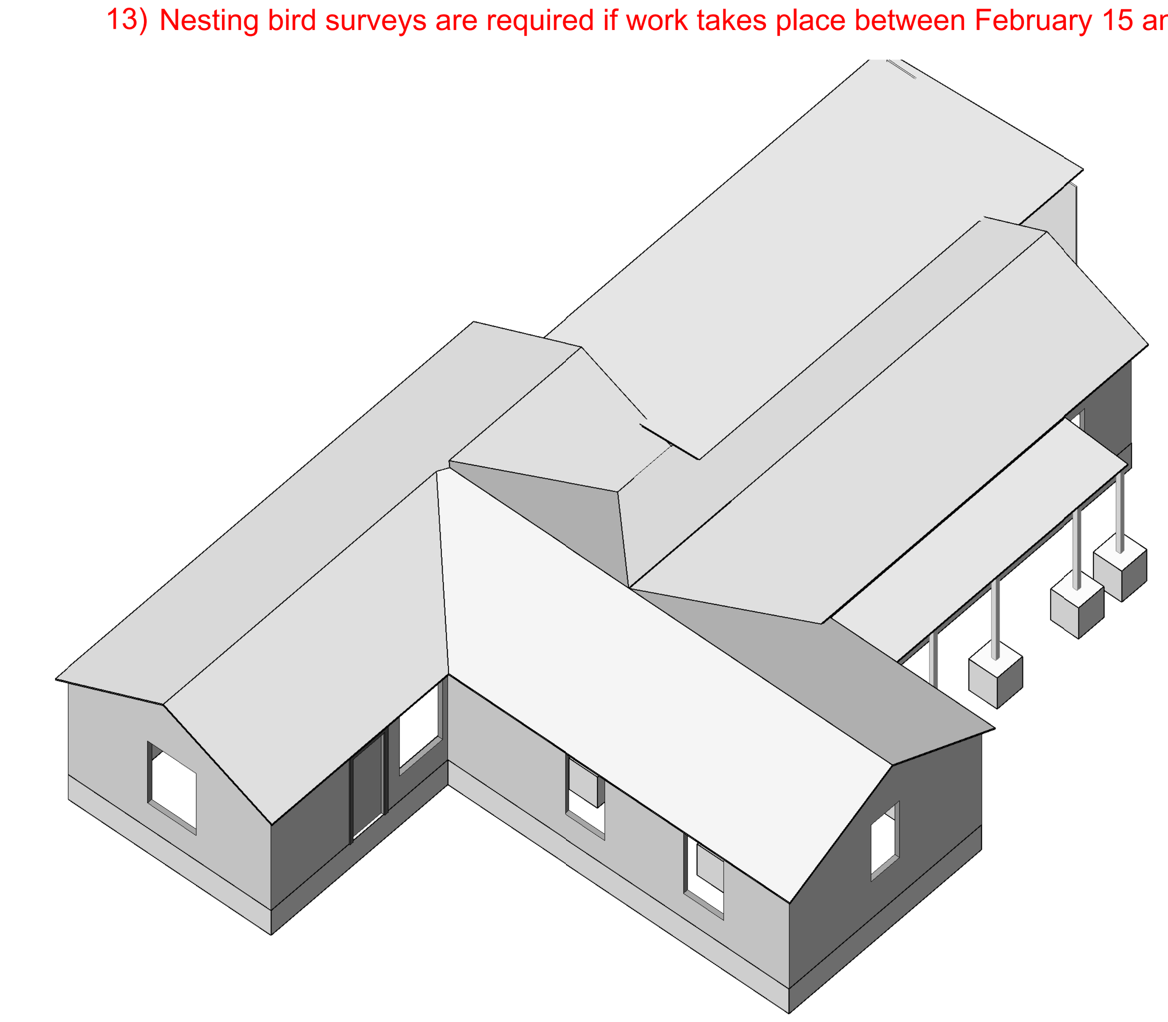
13) Nesting bird surveys are required if work takes place between February 15 and August 30



NORTH

ROOF FRAMING PLAN BOD OPTION 3

1/4" = 1'-0"



2 3D ISO VIEW

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 3
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

SHEET DESCRIPTION

EXISTING ROOF PLAN

ENGR: SRP
PM: SRP
DATE: NOV 22, 2019

SHEET

3-S2.2

C:\revit_local\R2019\19235_Sierra_Beatty Home_S19C_leos@zfa.com.rvt

11/22/2019 2:07:32 PM

PRINT TO 11x17

Attachment 3

BASIS OF DESIGN: ALTERNATIVE 4

1) Demolishing the structure, which has been determined an historic resource, may require additional processes to obtain demolition permits.

2) Removal of all hazardous materials prior to demolition of the building (See Exhibit D).

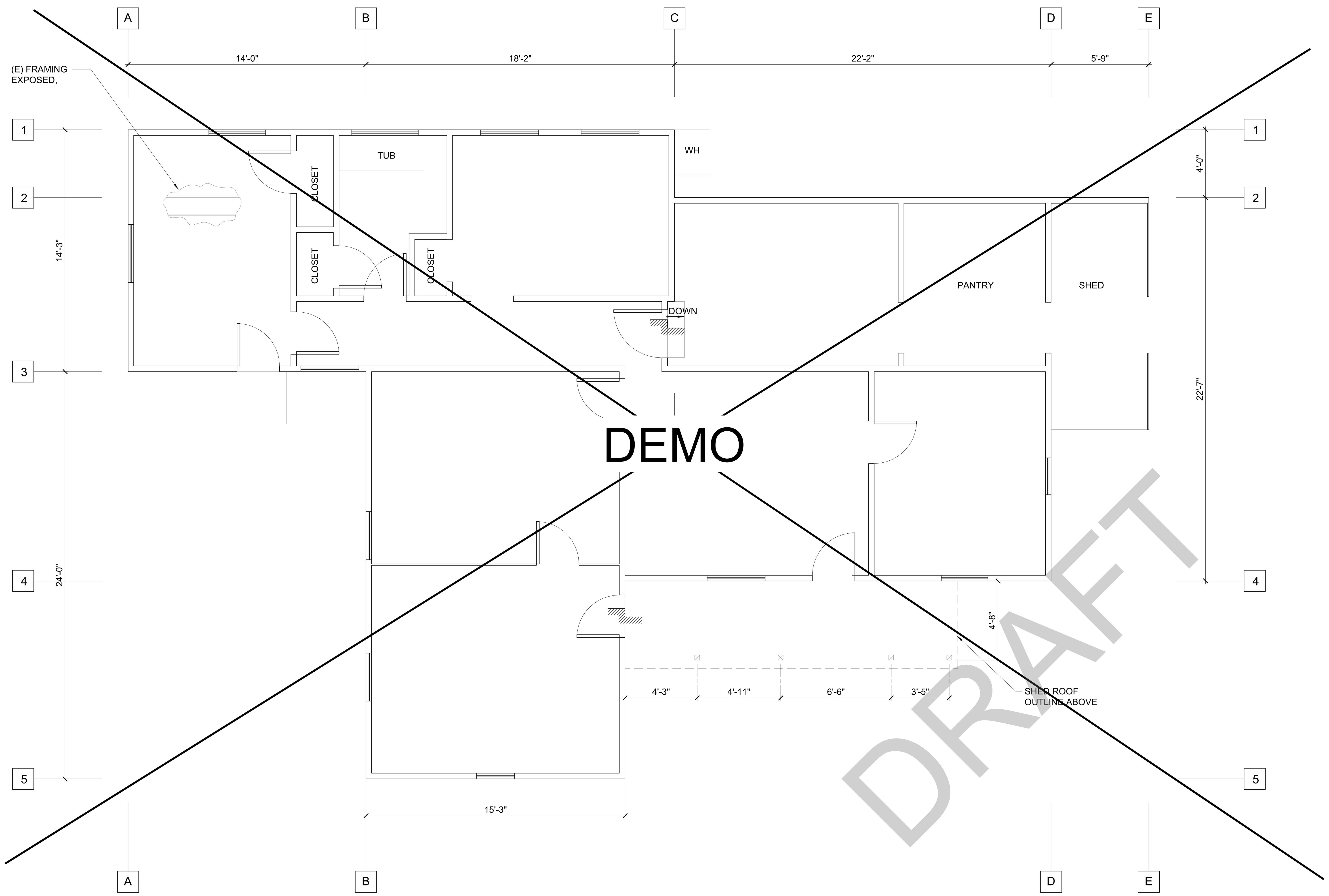
3) The site landscaping would be rehabilitated to return it as close as possible to its original condition prior to the construction of the building.

4) Installation of interpretive features (signage) documenting the pre-demo site conditions and previous use and inhabitants of the site.

5) The demolition option is being requested pending completion of regulatory approval for cost estimation purposes only.

6) Complete removal of the building would result in the lowest continued annual maintenance costs for this site, but the feasibility of this option is dependent upon regulatory approval process.

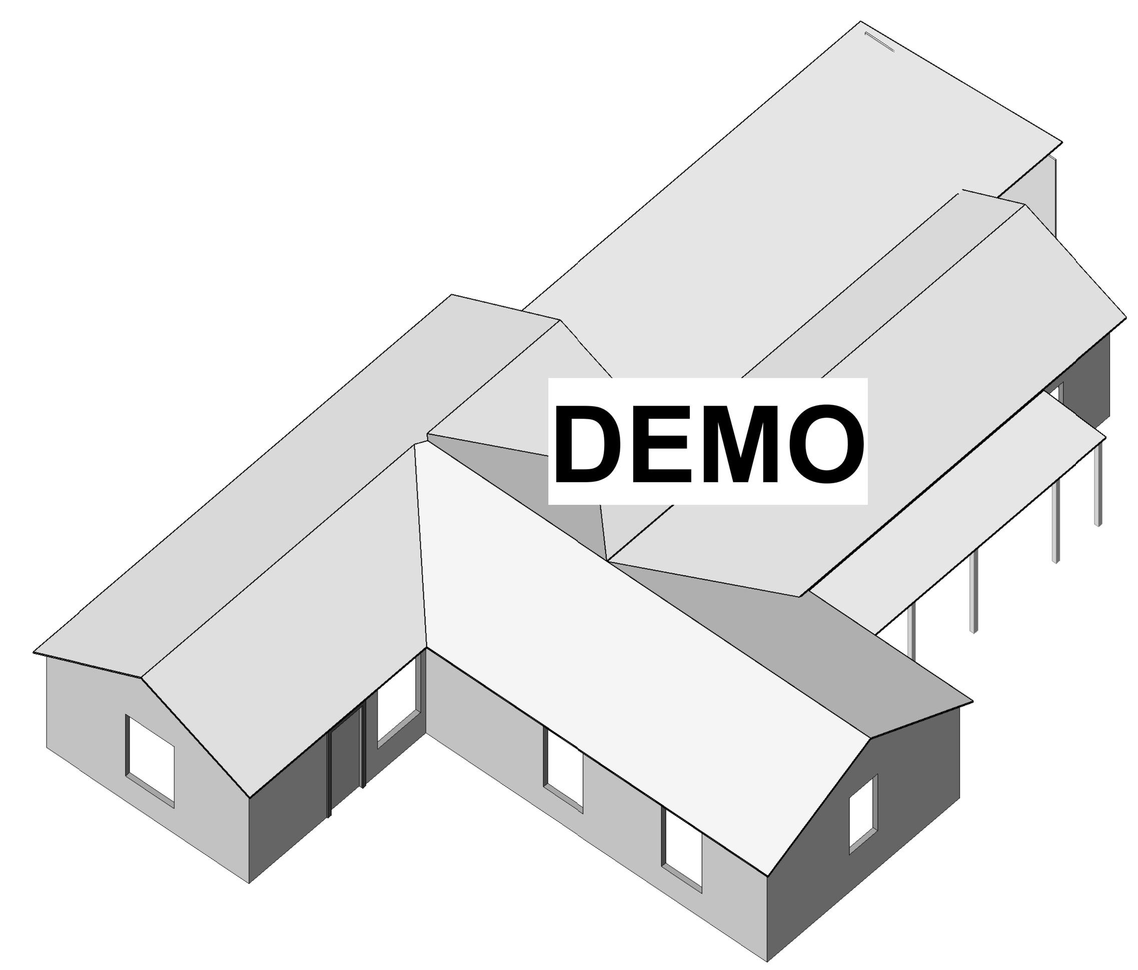
7) Nesting bird surveys are required if work takes place between February 15 and August 30



NORTH

FLOOR FRAMING PLAN BOD OPTION 4

1/4" = 1'-0"



2 3D ISO VIEW

C:\revit_local\R2019\19235_Sierra_Beatty Home_S19C_leos@zfa.com.rvt

11/22/2019 2:07:34 PM

PRINT TO 11x17

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
zfa job no.19235
zfa.com
650.394.8869
copyright © 2019

PROJECT

BEATTY PROPERTY HOME
BOD OPTION 4
SIERRA AZUL PRESERVE
17820 ALMA BRIDGE RD.
LOS GATOS, CA

SHEET DESCRIPTION

EXISTING FLOOR PLAN

ENGR: SRP	DATE: NOV 22, 2019
PM: SRP	

SHEET

4-S2.1

APPENDIX C – SUMMARY DATA SHEET

Summary Data Sheet

BUILDING DATA

Building Name:	Beatty Property Home	Date:	10/17/19
Building Address:	17820 Alma Road in Santa Clara County, Sierra Azul Preserve Open Space		
Latitude:	37.1908	Longitude:	-121.9856
By:			

Year Built:	1866-1877	Year(s) Remodeled:	N/A	Original Design Code:	None
Area (sf):	1,440	Length (ft):	55	Width (ft):	38
No. of Stories:	1	Story Height (ft):	8	Total Height (ft):	12

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☑ Residential ☐ Educational ☐ Other:

CONSTRUCTION DATA

Gravity Load Structural System:	Wood sheathing, joists, girders.		
Exterior Transverse Walls:	Wood framed	Openings?	Yes
Exterior Longitudinal Walls:	Wood framed	Openings?	Yes
Roof Materials/Framing:	See gravity load system.		
Intermediate Floors/Framing:	N/A		
Ground Floor:	Wood planking, wood joists, wood girders		
Columns:	Wood posts	Foundation:	Wood sleepers
General Condition of Structure:	Poor		
Levels Below Grade?	none		
Special Features and Comments:			

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	Wood siding shear walls	Wood siding shear walls
Vertical Elements:	Wood siding	Wood siding
Diaphragms:	1x horizontal lumber sheathing	1x horizontal lumber sheathing
Connections:	Toenails	Toenails

EVALUATION DATA

BSE-1N Spectral Response Accelerations:	S_{DS}=	1.554	S_{D1}=	0.962		
Soil Factors:	Class=	C	F_a=	1.0	F_v=	1.3
BSE-1E Spectral Response Accelerations:	S_{XS}=	2.777	S_{X1}=	1.283		
Level of Seismicity:		BSE-2E	Performance Level:	S-5		
Building Period:	T=	0.112				
Spectral Acceleration:	S_a=	1.27g				
Modification Factor:	$C_mC_1C_2$=	1.300	Building Weight: W=	32 kips		
Pseudo Lateral Force:	$V=C_mC_1C_2S_aW$=	53 kips				

BUILDING CLASSIFICATION: **W2 – Wood Frames Commercial and Industrial**

REQUIRED TIER 1 CHECKLISTS	Yes	No
Basic Configuration Checklist	☑	☐
Building Type W2 Structural Checklist	☑	☐
Nonstructural Component Checklist	☐	☑

FURTHER EVALUATION REQUIREMENT: **Tier 2 analysis on (11) structural deficiencies**

Material Properties

To account for uncertainty in the as-built data, a knowledge factor, κ, is determined according to ASCE 41 Table 6-1. Where material properties are not listed in existing construction documents, a knowledge factor of κ=0.75 shall be applied to the component capacities for deformation-controlled and force-controlled actions.

			Default Value per ASCE 41, 4.2.3?	*Alternate Value Source?*
Concrete			Table (4-2)	
Foundation Footings:	f'_c=	2,000 psi	☑	
Slabs:	f'_c=	2,000 psi	☑	
Reinforcing Steel			Table (4-3)	
#3 Bars:	f_y=	40,000 psi	☑	
#4 Bars and Larger:	f_y=	40,000 psi	☑	
Carpentry				
Wall studs and light Framing Members		Unknown		
Sheathing – Horizontal 1x lumber				
Sawn Lumber Posts, Timbers, beams and Stringers	Construction Grade			

APPENDIX D – TIER 1 CHECKLISTS AND STRUCTURAL CALCULATIONS

TIER 1 CHECKLISTS

Table 17-1. Very Low Seismicity Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Structural Components

☐ C ☑ NC ☐ N/A ☐ U	*LOAD PATH: The structure contains a complete, well-defined load path,including structural elements and connections, that serves to transfer theinertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
☐ C ☐ NC ☑ N/A ☐ U	*WALL ANCHORAGE: Exterior concrete or masonry walls that are dependenton the diaphragm for lateral support are anchored for out-of-plane forcesat each diaphragm level with steel anchors, reinforcing dowels, or straps thatare developed into the diaphragm. Connections have adequate strength toresist the connection force calculated in the Quick Check procedure ofSection 4.4.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)*

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low Seismicity

Building System—General

☐ C ☑ NC ☐ N/A ☐ U	*LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)*
☐ C ☐ NC ☑ N/A ☐ U	*ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25%of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)*
☐ C ☐ NC ☑ N/A ☐ U	*MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)*

Building System—Building Configuration

☐ C ☐ NC ☑ N/A ☐ U	*WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)*
	Inadequate number of bays of braced frames are provided. Due lack of redundancy, further evaluation of the braced frames is required to ensure structural adequacy.
☐ C ☐ NC ☑ N/A ☐ U	*SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)*
☐ C ☐ NC ☑ N/A ☐ U	*VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)*
☐ C ☐ NC ☑ N/A ☐ U	*GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)*
☐ C ☐ NC ☑ N/A ☐ U	*MASS:There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)*
☐ C ☐ NC ☑ N/A ☐ U	*TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)*

Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)

Geologic Site Hazards

TIER 1 CHECKLISTS

Table 17-2. Collapse Prevention Basic Configuration Checklist

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

☑ C ☐ NC ☐ N/A ☐ U	*LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)*
☑ C ☐ NC ☐ N/A ☐ U	*SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)*
☑ C ☐ NC ☐ N/A ☐ U	*SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)*

High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)

Foundation Configuration

☑ C ☐ NC ☐ N/A ☐ U	*OVERTURNING:The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)*
☐ C ☑ NC ☐ N/A ☐ U	*TIES BETWEEN FOUNDATION ELEMENTS:The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)*

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Low and Moderate Seismicity

Seismic-Force-Resisting System

☑ C ☐ NC ☐ N/A ☐ U	*REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)* Non Compliant below the ground floor
☐ C ☑ NC ☐ N/A ☐ U	*SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):* *Structural panel sheathing 1,000 lb/ft* *Diagonal sheathing 700 lb/ft* *Straight sheathing 100 lb/ft* *All other conditions 100 lb/ft* By observation no shear walls at crawl space
☐ C ☐ NC ☑ N/A ☐ U	*STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☐ NC ☑ N/A ☐ U	*NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)*
☐ C ☑ NC ☐ N/A ☐ U	*WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)* No positive connection of walls thru floor level are evident
☐ C ☐ NC ☑ N/A ☐ U	*HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)* No shear walls present
☐ C ☑ NC ☐ N/A ☐ U	*CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)* No shear walls present
☐ C ☐ NC ☑ N/A ☐ U	*OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)*

Connections

☐ C ☑ NC ☐ N/A ☐ U	*WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)* None present by obsevation

TIER 1 CHECKLISTS

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

☐ C	☑ NC	☐ N/A	☐ U	*WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)*
				None present by obsevation
☐ C	☑ NC	☐ N/A	☐ U	*GIRDER/COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)*
				None present by obsevation

High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)

Connections

☐ C	☑ NC	☐ N/A	☐ U	*WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)*
				None present by obsevation

Diaphragms

☐ C	☐ NC	☑ N/A	☐ U	*DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)*
☐ C	☑ NC	☐ N/A	☐ U	*ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)*
☑ C	☐ NC	☐ N/A	☐ U	*STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)*
☐ C	☐ NC	☑ N/A	☐ U	*SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)*
				Only Horiz. Lumber sheathing is present, no diagonal lumber or structural panels used in existing diaphragm construction.
☐ C	☐ NC	☑ N/A	☐ U	*DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and shall have aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)*
☐ C	☐ NC	☑ N/A	☐ U	*OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)*

SEISMIC HAZARD ANALYSIS

ASCE 41-17 §2.4

Site Coordinates

Latitude =	37.1908	deg	Beatty Property Home Condition Assessment
Longitude =	-121.9856	deg	Santa Clara County

Spectral Response Acceleration Parameters

ASCE 41-17 §2.4.1.4

Site Class =	C		Site Soil Classification
S_S =	1.058	g	Mapped Short-period Spectral Response Acceleration
S_1 =	0.378	g	Mapped 1-sec period Spectral Response Acceleration
S_{XS} =	1.270	g	Short-period Spectral Response Acceleration at BSE-1E
S_{X1} =	0.567	g	1-sec period Spectral Response Acceleration at BSE-1E

SEISMIC FORCE

ASCE 41-17 §4.5.2

Building Properties

Type N/S =	W1		Building Type in North-South Direction	*ASCE 41-17 Table 3-1*
Type E/W =	W1		Building Type in East-West Direction	*ASCE 41-17 Table 3-1*
Height, h_n =	10.00	ft	Height above base to roof level	
Stories =	1		Number of stories	
Weight N/S =	32.0	k	Seismic Weight of Building in North-South Direction	
Weight E/W =	32.0	k	Seismic Weight of Building in East-West Direction	

Building Period

ASCE 41-17 §4.5.2.4

North-South Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.112	sec	Fundamental Period	$=C_t*h_n^{\beta}$

East-West Direction:

C_t =	0.02		Period Adjustment Factor	
β =	0.75		Empirical Fundamental Period Adjustment Factor	
T =	0.112	sec	Fundamental Period	$=C_t*h_n^{\beta}$

Pseudo-Seismic Force

ASCE 41-17 §4.5.2.1

North-South Direction:

S_a =	1.27	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.65	*W	Pseudo-Seismic Force in Terms of Weight	$=C*Sa*W$
V =	**52.8**	k	Pseudo-Seismic Force	

East-West Direction:

S_a =	1.27	g	Spectral Response Acceleration	$=S_{x1}/T < S_{xs}$
C =	1.30		Modification Factor	*Table 4-8*
V =	1.65	*W	Pseudo-Seismic Force in Terms of Weight	$=C*Sa*W$
V =	**52.8**	k	Pseudo-Seismic Force	

WOOD SHEAR WALL SHEAR STRESS CHECK

ASCE 41-13 §A.3.2.7.1

The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):

Definition:

Wood Shear Wall Shear Capacity	
Structural panel sheathing	1000 plf
Diagonal sheathing	700 plf
Straight sheathing	100 plf
All other conditions	100 plf

P.O. = CP Performance objective

Sheathing = Straight sheathing

v_{cap} = 100 plf Shear capacity of shear wall

v_j^{avg} = $(1 / M_s)(V_j / L_{net})$ Average shear stress in shear walls

V_j = Story shear at level j

L_{wall} = Total length of shear wall

L_{opngs} = Total length of openings in shear wall

L_{net} = Net length of shear wall

M_s = 4.00 System modification factor per Table 4-9

North-South

Level	Gridline	V_j *k*	L_{wall} *ft*	L_{opngs} *ft*	L_{net} *ft*	v_j^{avg} *plf*	DCR
Level 1	1	2.6	32.0	14.0	18.0		
	2	13.6	28.0	0.0	28.0		
	3	20.6	54.0	7.0	47.0		
	4	12.8	25.0	9.0	16.0		
	5	3.3	15.0	3.5	11.5		
	6				0.0		
TOTAL		52.8	154.0	33.5	120.5	110	**1.10**

EXHIBIT C

Geotechnical Investigation

by Romig Engineers

Attachment 3

GEOTECHNICAL INVESTIGATION

BEATTY PROPERTY HOME STRUCTURAL STABILIZATION

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

SIERRA AZUL PRESERVE

SANTA CLARA COUNTY, CALIFORNIA

DRAFT

Prepared for

ZFA Structural Engineers

1390 El Camino Real, Suite 100

San Carlos, California 94070

October 2019

Project No. 4907-3

ROMIG ENGINEERS

October 11, 2019
4907-2

ZFA Structural Engineers
1390 El Camino Real, Suite 100
San Carlos, California 94070

**RE: GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION
BEATTY PROPERTY HOME
MIDPENINSULA REGIONAL OPEN SPACE
DISTRICT - SIERRA AZUL PRESERVE
SANTA CLARA COUNTY, CALIFORNIA**

Attention: Mr. Steve Patton, P.E.

Gentlemen:

In accordance with your request, we have performed a geotechnical investigation for the structural stabilization of the Beatty property home located in the Midpeninsula Regional Open Space District Sierra Azul Preserve in an unincorporated area of Santa Clara County near Los Gatos, California. The accompanying report summarizes the results of our field exploration, laboratory testing, and engineering analysis, and presents geotechnical recommendations for the proposed improvements.

We refer you to the text of our report for specific recommendations.

Thank you for the opportunity to work with you on this project. If you have any questions or comments concerning the findings or recommendations from our investigation, please call.

Very truly yours,

ROMIG ENGINEERS, INC.

REGISTERED PROFESSIONAL ENGINEER
LUCAS J. OTTOBONI
No. 84234
CIVIL
STATE OF CALIFORNIA

Lucas Ottoboni

Lucas J. Ottoboni, P.E.

G Romig

Glenn A. Romig, P.E., G.E.

REGISTERED PROFESSIONAL ENGINEER
GLENN A. ROMIG
002157
GEOTECHNICAL
STATE OF CALIFORNIA

Copies: Addressee (1 + via email)
Midpeninsula Regional Open Space District (via email)
Attn: Ms. Tanisha Werner

GAR:LO:pf

Attachment 3

GEOTECHNICAL INVESTIGATION
STRUCTURAL STABILIZATION – BEATTY PROPERTY HOME
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
SANTA CLARA COUNTY, CALIFORNIA

PREPARED FOR:

ZFA STRUCTURAL ENGINEERS
1390 EL CAMINO REAL, SUITE 100
SAN CARLOS, CALIFORNIA 94070

PREPARED BY:

ROMIG ENGINEERS, INC.
1390 EL CAMINO REAL, SECOND FLOOR
SAN CARLOS, CALIFORNIA 94070

OCTOBER 2019

ROMIG ENGINEERS

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

ROMIG ENGINEERS

GEOTECHNICAL INVESTIGATION
FOR
STRUCTURAL STABILIZATION – BEATTY PROPERTY HOME
MIDPENINSULA REGIONAL OPEN SPACE DISTRICT
SANTA CLARA COUNTY, CALIFORNIA

INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed structural stabilization of the Beatty property home located in the Midpeninsula Regional Open Space District Sierra Azul Preserve in an unincorporated area of Santa Clara County near Los Gatos, California. The location of the site is shown on the Vicinity Map, Figure 1. The purpose of this investigation was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for the proposed improvements.

Project Description

The project consists of improving or abandoning the Beatty property home in the Midpeninsula Regional Open Space District Sierra Azul Preserve. Since the options to abandon the structure will not require engineering solutions, those options have not been addressed in our report. If improved, the existing structure will either be stabilized to allow for exterior viewing only or as a limited use retreat. We also note that it is possible that the structure may be relocated. If this option is explored, we should be contacted to update our report, as the recommendations in this report only apply to the structure where it exists currently.

Scope of Work

The scope of our work for this investigation was presented in our agreement with ZFA Structural Engineers, dated June 25, 2019. In order to accomplish our investigation, we performed the following work.

- Review of geologic, geotechnical, and seismic conditions in the vicinity of the site.
- Subsurface exploration consisting of drilling and logging three exploratory borings near the existing structure.
- Laboratory testing of selected samples to aid in soil classification and to help evaluate the engineering properties of the soil and bedrock encountered at the site.

- Engineering analysis and evaluation of surface and subsurface data to develop earthwork guidelines and foundation design criteria for the project.
- Preparation of this report presenting our findings, conclusions, and geotechnical recommendations for the proposed improvements.

Limitations

This report has been prepared for the exclusive use of ZFA Structural Engineers for specific application to developing geotechnical design criteria for the proposed structural stabilization of the Beatty property home located in the Midpeninsula Regional Open Space District Sierra Azul Preserve in an unincorporated area of Santa Clara County near Los Gatos, California. We make no warranty, expressed or implied, for the services performed for this project. Our services have been performed in accordance with the geotechnical engineering principles generally accepted at this time and location. This report was prepared to provide engineering opinions and recommendations only. In the event there are any changes in the nature, design, or location of the project, or if any future improvements are planned, the conclusions and recommendations presented in this report should not be considered valid unless: 1) the project changes are reviewed by us, and; 2) the conclusions and recommendations presented in this report are modified or verified in writing.

The analysis, conclusions, and recommendations presented in this report are based on site conditions as they existed at the time of our investigation; the currently planned improvements; review of readily available reports relevant to the site conditions; and laboratory test results. In addition, it should be recognized that certain limitations are inherent in the evaluation of subsurface conditions, and that certain conditions may not be detected during an investigation of this type. Changes in the information or data gained from any of these sources could result in changes in our conclusions or recommendations. If such changes occur, we should be advised so that we can review our report in light of those changes.

SITE EXPLORATION AND RECONNAISSANCE

Site reconnaissance and subsurface exploration were performed on September 9, 2019. Subsurface exploration was performed using portable Minuteman drilling and sampling equipment. Three exploratory borings were advanced to sampler refusal conditions at depths of 7.8 to 10 feet. The locations of the borings are shown on the Site Plan, Figure 2. The boring logs and the results of our laboratory tests performed on samples collected during our investigation are attached in Appendices A and B, respectively.

Surface Conditions

The site is located within the Sierra Azul Open Space Preserve east of the Lexington Reservoir east of Alma Bridge Road. At the time of our investigation, the site was occupied by a single-story residence with wood-siding exterior. The area immediately surrounding the residence was vegetated with native grasses and medium to larger trees.

The residence was situated on a relatively flat pad which sloped down gently to the west. Beyond the relatively flat pad (about 15 to 20 feet away from the perimeter of the residence), the site slopes down to the north and south sides at a declination of about 3:1 to 2:1 (horizontal:vertical). At the west side, an over-steepened road cut slopes down to Alma Bridge Road at a declination of about 1.5: to 1:1 (horizontal:vertical).

The residence appeared to be supported on wood foundations at the perimeter and interior which were in direct contact with the earth. The existing residence was generally in poor condition with some of the wood siding and wood flooring observed to be deteriorating. The wood members in direct contact with the earth appeared to be rotted/deteriorating/weak.

Subsurface Conditions

At the location of our exploratory borings, we generally encountered claystone and sandstone bedrock of the Santa Clara Formation which extended to the maximum depths explored of 8 feet, 7.8 feet, 10 feet in Borings EB-1, EB-2, and EB-3. We also note that we encountered 3 feet of clayey sand in the upper portion of Boring EB-1.

A free-swell test performed on a sample of bedrock obtained in Boring EB-3 indicated a free swell value of 40 percent. This free-swell test result along with our experience suggests the bedrock tested has a low potential for expansion.

Ground Water

Free ground water was not encountered in the borings during our investigation. The borings were backfilled with grout immediately after drilling and sampling was completed; therefore, a stabilized ground water level was not obtained. Please be cautioned that fluctuations in the level of ground water can occur due to variations in rainfall, landscaping, underground drainage patterns, and other factors. It is also possible and perhaps even likely that perched ground water conditions could develop in the soils and near the surface of the bedrock during and after significant rainfall or due to landscape watering at the property and the upslope areas.

GEOLOGIC SETTING

We have briefly reviewed our local experience and the geologic literature pertinent to the general site area. The information reviewed indicates that the site is located in a chaotic geologic setting mapped as being underlain by undivided alluvial terrace deposits (Qt), Santa Clara Formation bedrock (QTsc) and Mélange of the Central belt (fm), McLaughlin et al. (2001).

The alluvial terrace deposits are expected to consist of boulders, gravel, sand, silt, and soil deposited in stream and alluvial fan settings. The Santa Clara Formation bedrock is described as consisting of sandstone and siltstone and locally includes thinly bedded mudstone. The Mélange is described as consisting of a matrix of sheared argillite and lithic metasandstone metamorphosed to pumpellyite- and locally to lawsonite-bearing assemblages. The mélange matrix typically exhibits as a weak to moderate clastic structure and may also include chert, limestone, and mafic igneous rocks. The geology of the site vicinity is shown on the Vicinity Geologic Map, Figure 3.

The lot and immediate site vicinity are located in a moderately sloping hillside area east of the Lexington Reservoir at an elevation of approximately 700 feet above sea level, Figure 1.

Faulting and Seismicity

There are no mapped through-going faults within or adjacent to the site and the site is not located within a State of California Earthquake Fault Zone (formerly known as a Special Studies Zone), an area where the potential for fault rupture is considered probable. The closest active fault is the San Andreas fault, which is located approximately 1.4 miles southwest of the property. Thus, the likelihood of surface rupture occurring from active faulting at the site is low.

In addition, we note that the site is located in a Santa Clara County fault zone due to the proximity of the Lexington fault. Based on Cross Section D-D prepared by McLaughlin et al. (2001), the site appears to be located west of the interpreted fault. Since the project scope does not include an increase in size or footprint of the structure, but instead, consists of voluntary improvements to an existing structure, evaluation of the potential for fault rupture was not included in our investigation of the site.

The San Francisco Bay Area is an active seismic region. Earthquakes in the region result from strain energy constantly accumulating because of the northwestward movement of the Pacific Plate relative to the North American Plate. On average about 1.6-inches of movement occur per year. Historically, the Bay Area has experienced large, destructive earthquakes in 1838, 1868, 1906, and 1989. The faults considered most likely to produce large earthquakes in the area include the San Andreas, San Gregorio, Hayward, and Calaveras faults. The San Gregorio fault is located approximately 18 miles southwest of the site. The Hayward and Calaveras faults are located approximately 16 and 18 miles northeast of the site, respectively. These faults and significant earthquakes that have been documented in the Bay Area are listed in Table 1, and are shown on the Regional Fault and Seismicity Map, Figure 4.

Table 1. Earthquake Magnitudes and Historical Earthquakes
Beatty Property Home Structural Stabilization
Santa Clara County, California

Fault	Maximum Magnitude (Mw)	Historical Earthquakes	Estimated Magnitude
San Andreas	7.9	1989 Loma Prieta	6.9
		1906 San Francisco	7.9
		1865 N. of 1989 Loma Prieta Earthquake	6.5
		1838 San Francisco-Peninsula Segment	6.8
		1836 East of Monterey	6.5
Hayward	7.1	1868 Hayward	6.8
		1858 Hayward	6.8
Calaveras	6.8	1984 Morgan Hill	6.2
		1911 Morgan Hill	6.2
		1897 Gilroy	6.3
San Gregorio	7.3	1926 Monterey Bay	6.1

In the future, the subject property will undoubtedly experience severe ground shaking during moderate and large magnitude earthquakes produced along the San Andreas fault or other active Bay Area fault zones. Using information from recent earthquakes, improved mapping of active faults, ground motion prediction modeling, and a new model for estimating earthquake probabilities, a panel of experts convened by the U.S.G.S. have concluded there is a 72 percent chance for at least one earthquake of Magnitude 6.7 or larger in the Bay Area before 2043. The Hayward fault has the highest likelihood of an earthquake greater than or equal to magnitude 6.7 in the Bay Area, estimated at 33 percent, while the likelihood on the San Andreas and Calaveras faults is estimated at approximately 22 and 26 percent, respectively (Aagaard et al., 2016).

Earthquake Design Parameters

The State of California currently requires that buildings and structures be designed in accordance with the seismic design provisions presented in the 2016 California Building Code and in ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures." Based on site geologic conditions and on information from our subsurface exploration at the site, the site may be classified as Site Class C, very dense soil and soft rock, in accordance with Chapter 20 of ASCE 7-10. Spectral Response Acceleration parameters and site coefficients may be taken directly from the U.S.G.S. website based on the longitude and latitude of the site. For site latitude (37.1908), longitude (-121.9856) and Site Class C, design parameters are presented on Table 2 on the following page.

Table 2. 2016 CBC Seismic Design Criteria
Beatty Property Home Structural Stabilization
Santa Clara County, California

Spectral Response Acceleration Parameters			Design Value
Mapped Value for Short Period	-	S_S	2.331
Mapped Value for 1-sec Period	-	S_1	1.111
Site Coefficient	-	F_a	1.0
Site Coefficient	-	F_v	1.3
Adjusted for Site Class	-	S_{MS}	2.331
Adjusted for Site Class	-	S_{M1}	1.444
Value for Design Earthquake	-	S_{DS}	1.554
Value for Design Earthquake	-	S_{D1}	0.962

CONCLUSIONS

From a geotechnical viewpoint, the site is suitable for the proposed structural stabilization of the Beatty property home, provided the recommendations presented in this report are followed during design and construction. Specific geotechnical recommendations are provided in the following sections of this report.

The primary geotechnical concern for the proposed project is the potential for severe ground shaking at the site during a major earthquake. In our opinion, the residence may be retrofitted to be supported on conventional spread footing foundations bearing on bedrock. Specific geotechnical recommendations are provided in the following sections of this report.

Because subsurface conditions may vary from those encountered at the location of our borings, and to observe that our recommendations are properly implemented, we recommend that we be retained to 1) review the project plans for conformance with our recommendations; and 2) observe and test during earthwork and foundation construction.

FOUNDATIONS

Shallow Foundations

In our opinion, the Beatty property home may be retrofitted/supported on conventional spread footing foundations bearing in undisturbed weathered bedrock. The footings should have a width of at least 15 inches and should extend at least 24 inches below exterior grade, 18 inches below the bottom of concrete slabs-on-grades, and 15 inches below the crawl space grade, whichever is deeper. Footings should extend at least 6 inches into bedrock if this requires a deeper embedment than stated above.

Lowest adjacent finished grade should be considered to be the lowest grade within 5 feet of the edge of the foundation. Footings with at least these minimum dimensions may be designed for an allowable bearing pressure of 3,000 pounds per square foot for dead plus live loads with a one-third increase allowed when considering additional short-term wind or seismic loading.

All footings located adjacent to utility lines should be embedded below a 1:1 plane extending up from the bottom edge of the utility trench. All continuous footings should be reinforced with top and bottom steel, to provide structural continuity and to permit spanning of local irregularities.

The bottom of all footing excavations should be cleaned of loose or soft soil and/or disturbed bedrock or debris. A member of our staff should observe the footing excavations prior to placement of reinforcing steel to confirm that they expose suitable material, have at least the recommended minimum dimensions, and have been properly cleaned. If soil and/or disturbed bedrock or debris is encountered in the foundation excavations, our field representative will require these materials be removed and a deeper footing embedment depth before the reinforcing steel and concrete is placed.

Since the existing foundations were constructed with no geotechnical observation, and the depth and width of the foundations are unknown, there is more uncertainty concerning their performance than for the new footings for the addition. If the structural load on the existing foundations will be increased significantly, it may be prudent to selectively underpin the foundations as needed to reduce post-construction differential settlement due to the new loads from the proposed addition. When the existing foundations are exposed during construction, the design and construction team should observe their condition and determine if any remedial measures or supplemental recommendations would be appropriate.

Lateral Loads

Lateral loads may be resisted by friction between the bottom of the footings and the supporting subgrade. A coefficient of friction of 0.35 may be assumed for design. In addition to friction, lateral resistance may also be provided by passive soil pressure acting against the sides of foundations cast neat in footing or backfilled with properly compacted structural fill. We recommend assuming an equivalent fluid pressure of 400 pounds per cubic foot for passive soil resistance, where appropriate. The upper foot of passive soil resistance should be neglected where soil adjacent to the foundations is not covered and protected by a concrete slab or pavement.

Settlement

Thirty-year post-construction differential settlement due to static loads is not expected to exceed about 3/4-inch across the proposed residence supported on new foundations, provided foundations are designed and constructed as recommended.

SLABS-ON-GRADE

General Slab Considerations

To reduce the potential for movement of at-grade slabs, at least the upper 6-inches of the subgrade soil should be scarified and compacted at a moisture content slightly above the laboratory optimum value. The soil subgrade should be kept moist up until the time the non-expansive fill, aggregate base, and/or vapor barrier is placed. Slab subgrades and non-expansive fill should be prepared and compacted as recommended in the section of this report titled "Earthwork." Overly soft or moist soils should be removed from slab-on-grade areas. Exterior flatwork should be underlain by a layer of non-expansive fill as recommended below. The non-expansive fill should consist of Class 2 aggregate base or clayey soil with a Plasticity Index of 15 or less.

Considering the potential for some differential movement of the surface and near-surface soils, we expect that reinforced slabs will perform better than unreinforced slabs. Consideration should be given to using a control joint spacing on the order of 2 feet in each direction for each inch of slab thickness.

Exterior Flatwork

Concrete walkways and exterior flatwork should be at least 4 inches thick and should be constructed on at least 6 inches of Class 2 aggregate base. We recommend that exterior slabs-on-grade, such as for patios, be constructed with a thickened edge to improve edge stiffness and to reduce the potential for water seepage under the edge of the slabs and into the underlying base and subgrade. In our opinion, the thickened edges should be at least 8 inches wide and should extend at least 4 inches below the bottom of the underlying aggregate base layer.

Interior Slabs

At-grade interior slab-on-grade floors, if any, should be constructed on a layer of non-expansive fill at least 6 inches thick. Recycled aggregate base should not be used for non-expansive fill below interior slabs-on-grade, since adverse vapor could occur from crushed asphalt components.

In areas where dampness of concrete floor slabs would be undesirable, such as within the garage and building interior, concrete slabs should be underlain by at least 6 inches of free-draining gravel, such as ½- to ¾-inch clean crushed rock with no more than 5 percent passing the ASTM No. 200 sieve. Pea gravel should not be used for this capillary break material. The crushed rock layer should be compacted and leveled with vibratory equipment. The crushed rock layer may be considered as the non-expansive fill recommended above.

To reduce vapor transmission up through at-grade concrete floor slabs, the crushed rock section should be covered with a high quality vapor barrier conforming to the requirements of ASTM E 1745 Class A, with a water vapor transmission rate less than or equal to 0.01 perms (such as 15-mil thick "Stego Wrap Class A"). The vapor barrier should be placed directly below the concrete slab. Sand above the vapor barrier is not recommended. The vapor barrier should be installed in accordance with ASTM E 1643. All seams and penetrations of the vapor barrier should be sealed in accordance with manufacturer's recommendations.

The permeability of concrete is affected significantly by the water cement ratio of the mix, with lower ratios producing more damp-resistant slabs and being stronger structurally. Where moisture protection is important and/or where the concrete will be placed directly on the vapor barrier, the water-to-cement ratio should be 0.45 or less. To increase the workability of the concrete, mid-range plasticizers can be added to the mix. Water should not be added to the mix unless the slump is less than specified and the ratio will not exceed 0.45. Other steps that may be taken to reduce moisture transmission through the slab (or mat) include moist curing for 5 to 7 days and allowing the slab to dry for a period of two months or longer prior to placing floor coverings. Also, prior to installation of the floor covering, it may be appropriate to test the slab moisture content for adherence to the manufacturer's requirements to determine whether a longer drying time is necessary.

EARTHWORK

Clearing and Subgrade Preparation

All deleterious materials, such as existing foundations, slabs, utilities to be abandoned, existing fill, vegetation, root systems, and topsoil, should be cleared from areas of the site to be built or paved on. The actual stripping depth should be determined by a member of our staff in the field at the time of construction. Excavations that extend below finished grade should be backfilled with structural fill that is water-conditioned, placed, and compacted as recommended in the section titled "Compaction."

After the site has been properly cleared, stripped, and excavated to the required grades, exposed soil surfaces in areas to receive structural fill or concrete slabs-on-grade should be scarified to a depth of 6 inches, moisture conditioned, and compacted as recommended in the section of this report titled "Compaction."

Material For Fill

All on-site soil containing less than 3 percent organic material by weight (ASTM D2974) should be suitable for use as structural fill. Structural fill should not contain rocks or pieces larger than 6 inches in greatest dimension and no more than 15 percent larger than 2.5 inches. Imported non-expansive fill should have a Plasticity Index no greater than 15, should be predominately granular, and should have sufficient binder so as not to slough or cave into foundation excavations and utility trenches. Recycled aggregate base should not be used for non-expansive fill at building interior. A member of our staff should approve proposed import materials prior to their delivery to the site.

Compaction

Scarified soil surfaces and all structural fill should be compacted in uniform lifts no thicker than 8 inches in pre-compacted thickness, conditioned to the appropriate moisture content, and compacted as recommended for structural fill in Table 3. The relative compaction and moisture content recommended in Table 3 is relative to ASTM Test D1557, latest edition.

Table 3. Compaction Recommendations
Beatty Property Home Structural Stabilization
Santa Clara County, California

General	Relative Compaction*	Moisture Content*
• Scarified subgrade in areas to receive fill or slabs.	90 percent	Above optimum
• Structural fill composed of non-expansive fill or native soil.	90 percent	Above optimum
• Structural fill below a depth of 5 feet.	93 percent	Above optimum
Pavement Areas		
• Upper 6-inches of soil below aggregate base.	95 percent	Near optimum
• Aggregate base.	95 percent	Near optimum
Utility Trench Backfill		
• On-site soil.	90 percent	Near optimum
• Imported sand	95 percent	Near optimum

* Relative to ASTM Test D1557, latest edition.

Temporary Slopes and Excavations

The contractor should be responsible for the design and construction of all temporary slopes and any required shoring. Shoring and bracing should be provided in accordance with all applicable local, state and federal safety regulations, including the current OSHA excavation and trench safety standards.

Because of the potential for variation of the on-site soils, field modification of temporary cut slopes and shoring may be required. Unstable materials encountered on slopes during and after excavation should be trimmed off even if this requires cutting the slopes back to a flatter inclination.

Protection of the structures near excavations and trenches should also be the responsibility of the contractor. In our experience, a preconstruction survey is generally performed to document existing conditions prior to construction, with intermittent monitoring of the structures during construction.

Finished Slopes

We recommend that new finished slopes be cut or filled to an inclination no steeper than 2:1 (horizontal:vertical). Exposed slopes may be subject to minor sloughing and erosion that could require periodic maintenance. We recommend that all slopes and soil surfaces disturbed during construction be planted to with erosion resistant vegetation.

Surface Drainage

Finished grades should be designed to prevent ponding of water and to direct surface water runoff away from foundations, edges of slabs, and pavements, and toward suitable collection and discharge facilities. Slopes of at least 2 percent are recommended for flatwork and pavement areas with 5 percent preferred in landscape areas within 8 feet of the structures, where possible. At a minimum, splash blocks should be provided at the discharge ends of roof downspouts to carry water away from perimeter foundations. Preferably, roof downspout water should be collected in a closed pipe system that is routed to a storm drain system or other suitable location.

Drainage facilities should be observed to verify that they are adequate and that no adjustments need to be made, especially during the first two years following construction. We recommend preparing an as-built plan showing the locations of surface and subsurface drain lines and clean-outs. The drainage facilities should be periodically checked to verify that they are continuing to function properly. It is likely the drainage facilities will need to be periodically cleaned of silt and debris that may build up in the lines.

FUTURE SERVICES

Plan Review

Romig Engineers should review the completed grading and foundation plans for conformance with the recommendations contained in this report. We should be provided with these plans as soon as possible upon completion in order to limit the potential for delays in the permitting process that might otherwise be attributed to our review process. In addition, it should be noted that many of the local building and planning departments now require “clean” geotechnical plan review letters prior to acceptance of plans for their final review. Since our plan reviews typically result in recommendations for modification of the plans, our generation of a "clean" review letter often requires two iterations.

At a minimum, we recommend that the following note be added to the plans:

"Earthwork, foundation construction, slab subgrade and non-expansive fill preparation, utility trench backfill, pavement construction and site drainage should be performed in accordance with the geotechnical report prepared by Romig Engineers, Inc., dated October 11, 2019. Romig Engineers should be notified at least 48 hours in advance of any earthwork or foundation construction and should observe and test during earthwork and foundation construction as recommended in the geotechnical report."

Construction Observation and Testing

The earthwork and foundation phases of construction should be observed and tested by us to: 1) confirm that subsurface conditions are compatible with those used in the analysis and design; 2) observe compliance with the design concepts, specifications, and recommendations; and 3) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations presented in this report are based on a limited amount of subsurface exploration. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it will be necessary to reevaluate our recommendations.

❖ ❖ ❖ ❖ ❖

REFERENCES

Aagaard, B.T., Blair, J.L., Boatwright, J., Garcia, S.H., Harris, R.A., Michael, A.J., Schwartz, D.P., and DiLeo, J.S., 2016, Earthquake outlook for the San Francisco Bay region 2014–2043 (ver. 1.1, August 2016): U.S. Geological Survey Fact Sheet 2016–3020, 6 p., http://dx.doi.org/10.3133/fs20163020.

American Society of Civil Engineers, 2010, Minimum Design Loads for Buildings and Other Structures, ASCE Standard 7-10.

California Building Standards Commission, and International Code Council, 2016 California Building Code, California Code of Regulations, Title 24, Part 2.

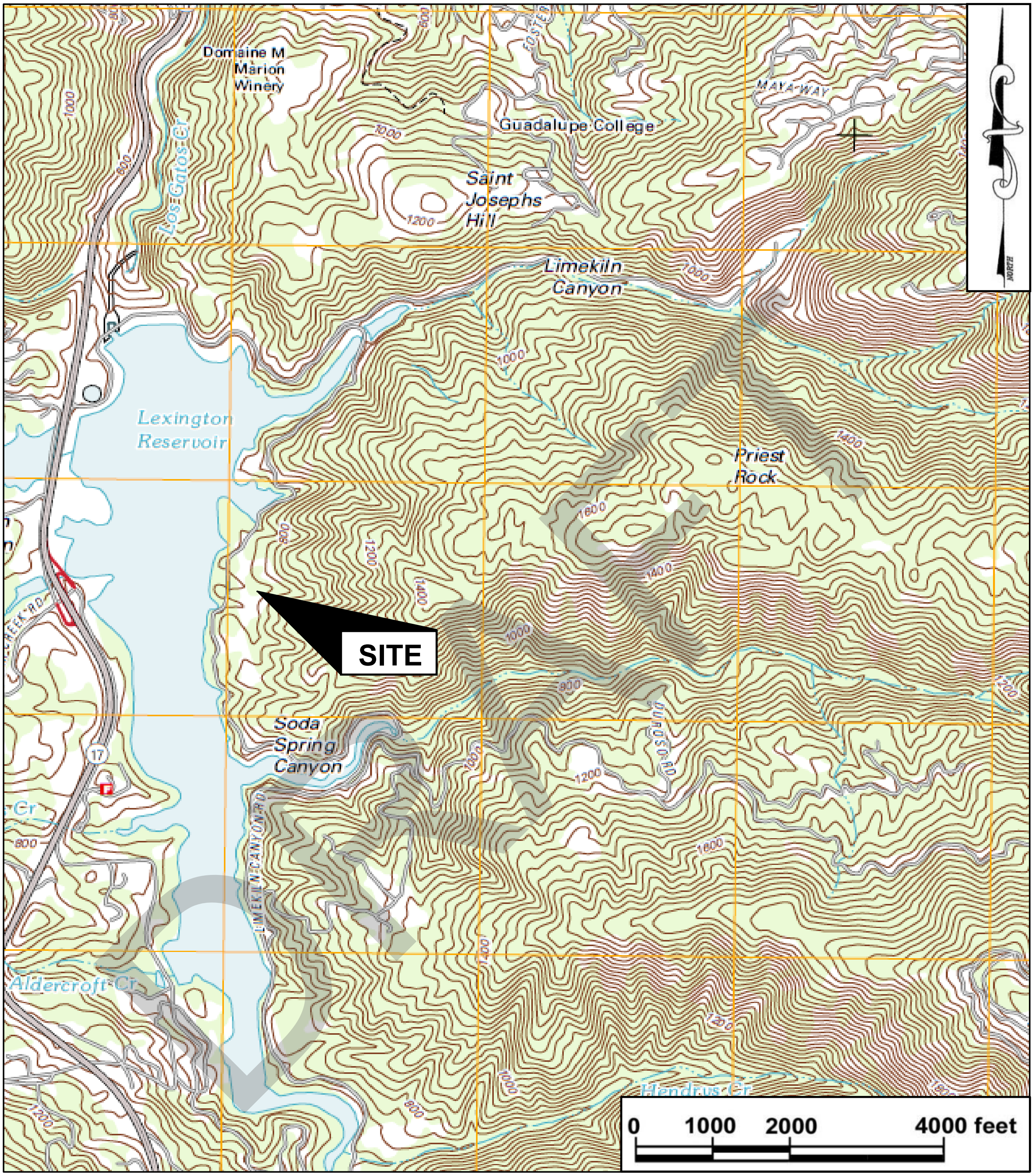
California Department of Conservation, Division of Mines and Geology (DMG), 1994, Fault-Rupture Hazard Zones in California, Special Publication 42.

California Geological Survey, 2019, Seismic Hazard Zone Report for the Woodside 7.5-Minute Quadrangle, Santa Clara, Alameda, and San Mateo Counties, California, Seismic Hazard Zone Report 129.

McLaughlin, R.J., Clark J.C., Brabb, E.E., Helley, E.J., 2001, Geologic Maps and Structure Sections of the Southwestern Santa Clara Valley and Southern Santa Cruz Mountains, Santa Clara and Santa Cruz Counties, California, USGS Miscellaneous Field Studies MF-2373, Sheet 1: Los Gatos Quadrangle, Scale 1:24,000.

U.S.G.S., 2018, U.S. Seismic Design Maps, Earthquake Hazards Program, http://earthquake.usgs.gov/designmaps/us/application.php.

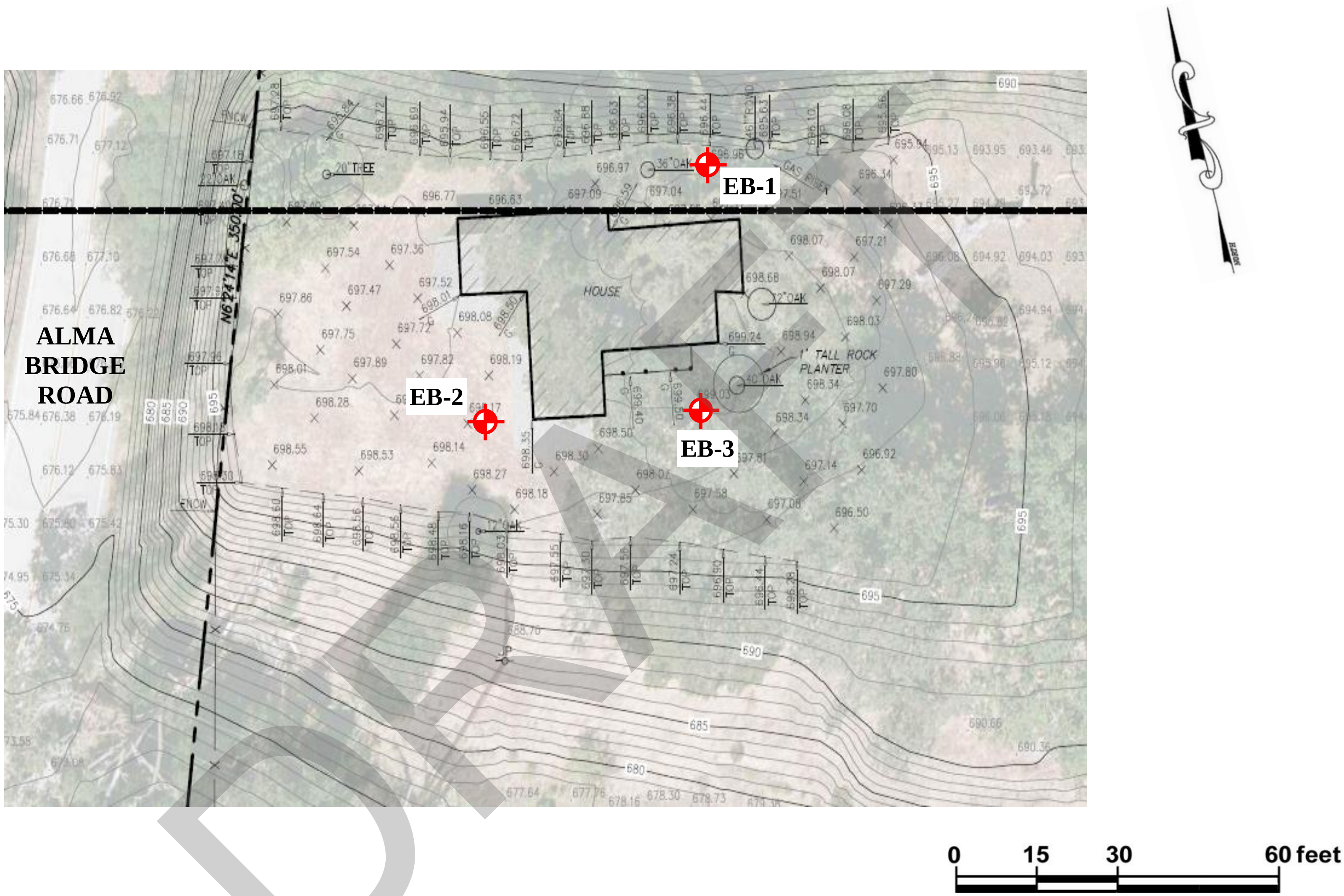
❖ ❖ ❖ ❖ ❖



Scale: 1 inch = 2000 feet
Base is United States Geological Survey Los Gatos 7.5 Minute Quadrangle, dated 2012.

VICINITY MAP **FIGURE 1**
MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019
LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS



LEGEND

EB-2 Approximate Locations of Exploratory Borings.

Approximate Scale: 1 inch = 40 feet.

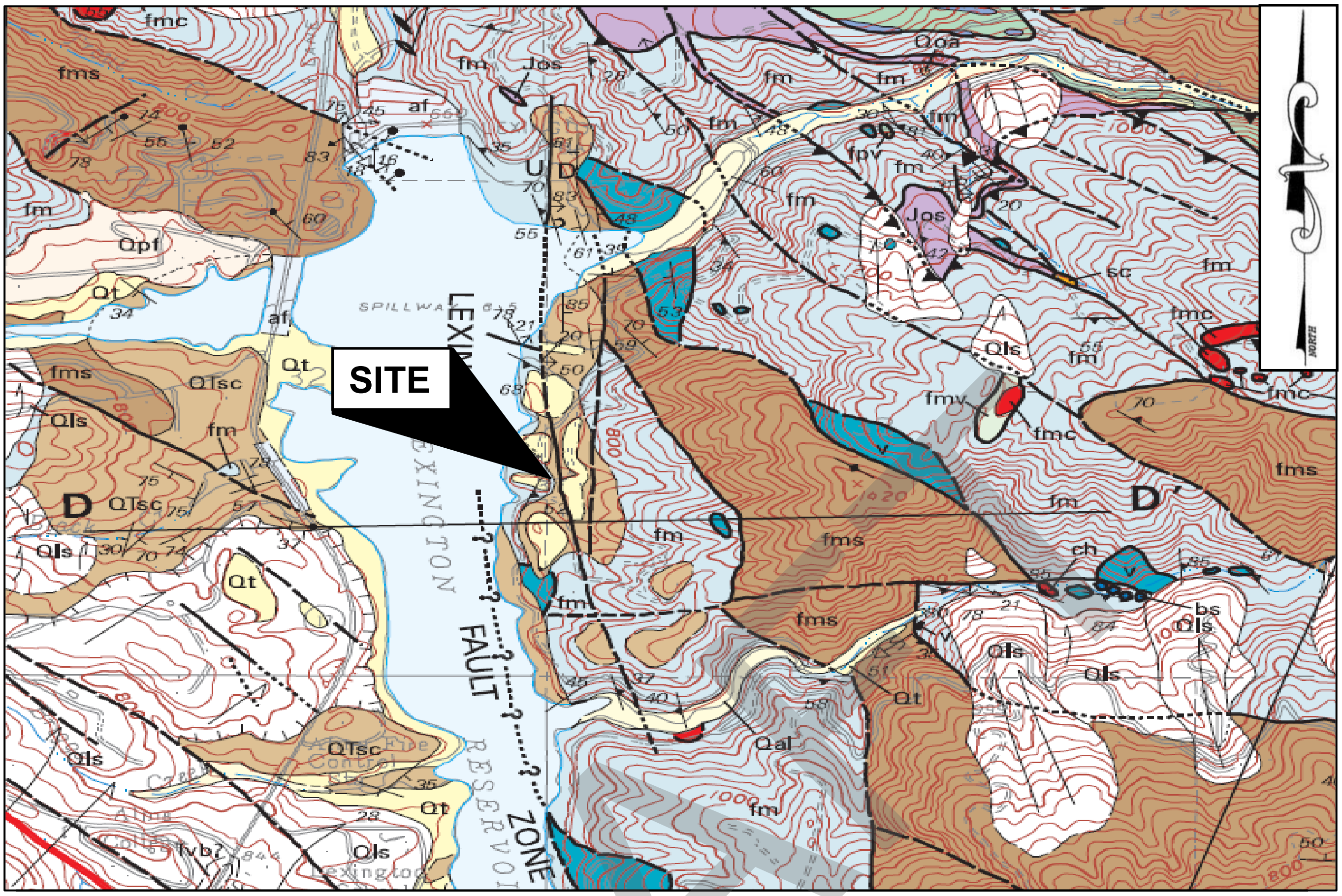
Base is an undated topographic survey provided to us.

SITE PLAN **FIGURE 2**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS



MAP LEGEND

Qt	Alluvial terrace deposits, undivided
QTsc	Santa Clara Formation
fm	Melange of the Central belt
v	Basaltic volcanic rock blocks

Geologic Contact - dashed where approximate, dotted where inferred.

Fault - dashed where approximate, dotted where inferred.

Fault - thrust or reverse

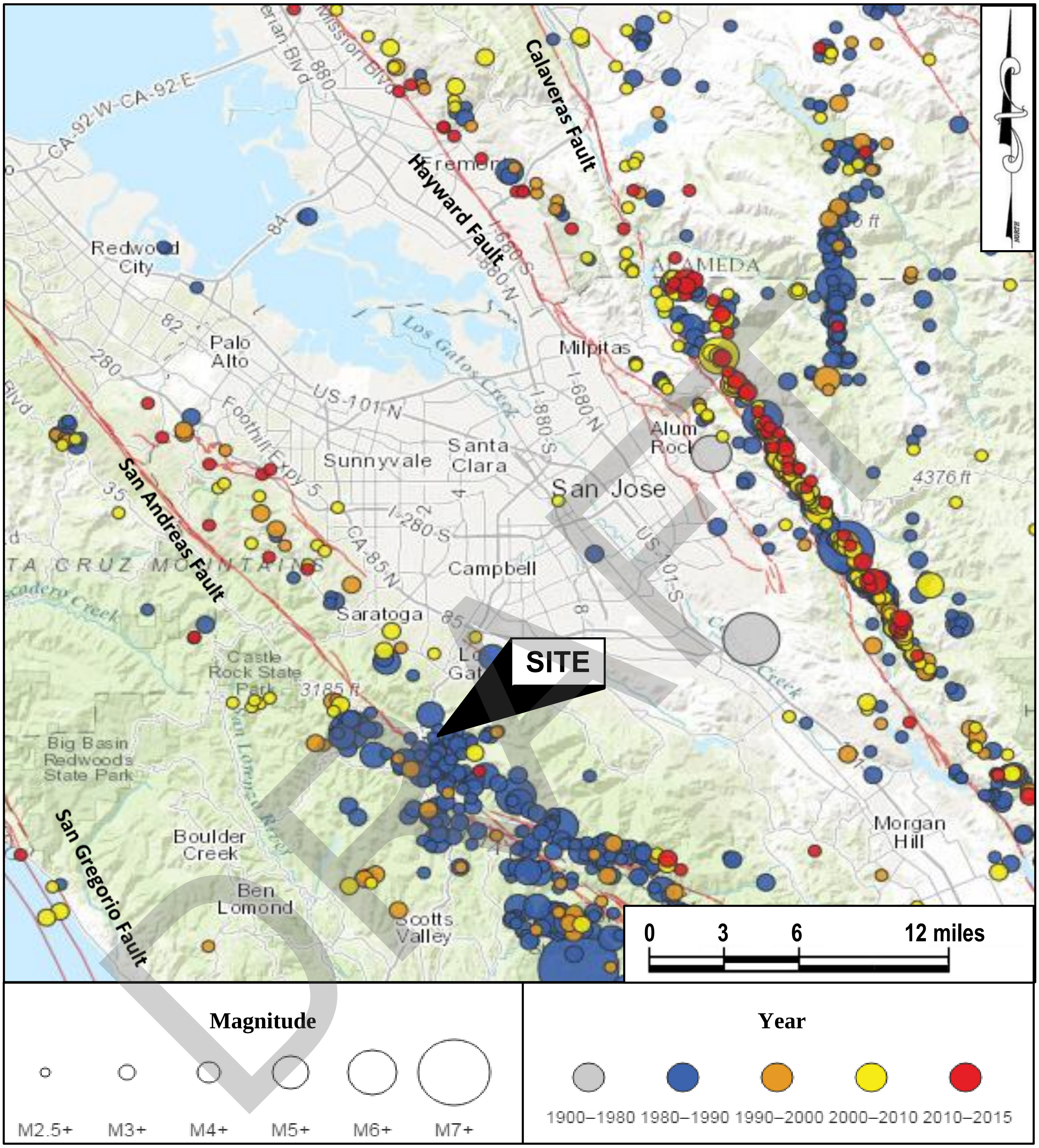
35 Strike and dip of bedding

0 1000 2000 4000 feet

Scale: 1 inch = 2000 feet
Base is Geologic Map of southwestern Santa Clara Valley and southern Santa Cruz Mountains, Santa Clara and Santa Cruz counties, California (McLaughlin, Clark, Brabb, Helley, and Colon, 2001)

VICINITY GEOLOGIC MAP | **FIGURE 3**
MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME | OCTOBER 2019
LOS GATOS, CALIFORNIA | PROJECT NO. 4907-3

ROMIG ENGINEERS



Earthquakes with M5+ from 1900 to 1980, M2.5+ from 1980 to January 2015. Faults with activity in last 15,000 years. Based on data sources from Northern California Earthquake Data Center and USGS Quaternary Fault and Fold Database, accessed May 2015.

REGIONAL FAULT AND SEISMICITY MAP — **FIGURE 4**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME — OCTOBER 2019

LOS GATOS, CALIFORNIA — PROJECT NO. 4907-3

ROMIG ENGINEERS

APPENDIX A

FIELD INVESTIGATION

The soils and bedrock encountered during drilling were logged by our representative and samples were obtained at depths appropriate to the investigation. The samples were taken to our laboratory where they were examined and classified in accordance with the Unified Soil Classification System. The logs of our borings, as well as a summary of the soil classification system (Figure A-1) and bedrock descriptions (Figure A-2) used on the logs, are attached.

Several tests were performed in the field during drilling. The standard penetration test resistance was determined by dropping a 140-pound hammer through a 30-inch free fall and recording the blows required to drive the 2-inch (outside diameter) sampler 18 inches. The standard penetration test (SPT) resistance is the number of blows required to drive the sampler the last 12 inches and is recorded on the boring logs at the appropriate depths. Soil samples were also collected using 2.5-inch and 3.0-inch O.D. drive samplers. The blow counts shown on the logs for these larger diameter samplers do not represent SPT values and have not been corrected in any way.

The locations and elevations of the borings were established by pacing using the site plan provided to us. The locations of the borings should be considered accurate only to the degree implied by the method used.

The boring logs and related information depict our interpretation of subsurface conditions only at the specific location and time indicated. Subsurface conditions and ground water levels at other locations may differ from conditions at the locations where sampling was conducted. The passage of time may also result in changes in the subsurface conditions.

❖ ❖ ❖ ❖ ❖

USCS SOIL CLASSIFICATION

PRIMARY DIVISIONS			SOIL TYPE	SECONDARY DIVISIONS
COARSE GRAINED SOILS (< 50 % Fines)	GRAVEL	CLEAN GRAVEL (< 5% Fines)	GW	Well graded gravel, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
		GRAVEL with FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SAND	CLEAN SAND (< 5% Fines)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SAND WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS (> 50 % Fines)	SILT AND CLAY Liquid limit < 50%		ML	Inorganic silts and very fine sands, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, lean clays.
			OL	Organic silts and organic clays of low plasticity.
	SILT AND CLAY Liquid limit > 50%		MH	Inorganic silt, micaceous or diatomaceous fine sandy or silty soil.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.
BEDROCK			BR	Weathered bedrock.

RELATIVE DENSITY

SAND & GRAVEL	BLOWS/FOOT*
VERY LOOSE	0 to 4
LOOSE	4 to 10
MEDIUM DENSE	10 to 30
DENSE	30 to 50
VERY DENSE	OVER 50

CONSISTENCY

SILT & CLAY	STRENGTH^	BLOWS/FOOT*
VERY SOFT	0 to 0.25	0 to 2
SOFT	0.25 to 0.5	2 to 4
FIRM	0.5 to 1	4 to 8
STIFF	1 to 2	8 to 16
VERY STIFF	2 to 4	16 to 32
HARD	OVER 4	OVER 32

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	

12 " 3" 0.75" 4 10 40 200

SIEVE OPENINGS U.S. STANDARD SERIES SIEVE

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

* Standard Penetration Test (SPT) resistance, using a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler; blow counts not corrected for larger diameter samplers.

^ Unconfined Compressive strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.

KEY TO SAMPLERS

Modified California Sampler (3-inch O.D.)

Mid-size Sampler (2.5-inch O.D.)

Standard Penetration Test Sampler (2-inch O.D.)

KEY TO EXPLORATORY BORING LOGS **FIGURE A-1**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS

WEATHERING

Fresh
Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very Slight
Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight
Rock generally fresh, joints stained, and discoloration extends into rock up to 1 inch. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate
Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some are clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately Severe
All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe
All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very Severe
All rock except quartz discolored and stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.

Complete
Rock reduced to "soil". Rock fabric not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

HARDNESS

Very hard
Cannot be scratched with knife or sharp pick. Hand specimens requires several hard blows of geologist's.

Hard
Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately Hard
Can be scratched with knife or pick. Gouges or grooves to 1/4 inch deep can be excavated by hard blow of point of a geologist's pick. Hard specimen can be detached by moderate blow.

Medium
Can be grooved or gouged 1/16 inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 inch maximum size by hard blows of the point of a geologist's pick.

Soft
Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be brocken by finger pressure.

Very Soft
Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

JOINT BEDDING AND FOLIATION SPACING

Spacing	Joints	Bedding and Foliation
Less than 2 in.	Very Close	Very Thin
2 in. to 1 ft.	Close	Thin
1 ft. to 3 ft.	Moderately Close	Medium
3 ft. to 10 ft.	Wide	Thick
More than 10 ft.	Very Wide	Very Thick

ROCK QUALITY DESIGNATOR (RQD)

RQD, as a percentage	Descriptor
Exceeding 90	Excellent
90 to 75	Good
75 to 50	Fair
50 to 25	Poor
Less than 25	Very Poor

KEY TO BEDROCK DESCRIPTIONS
MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME
LOS GATOS, CALIFORNIA

FIGURE A-2
OCTOBER 2019
PROJECT NO. 4907-3

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AS

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 697' **DATE DRILLED:** 09/09/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Brown, Clayey Sand, slightly moist, fine to coarse sand, fine to coarse grained angular to subangular gravel, low to moderate plasticity fines, roots, rock fragments, possible fill.		SC		0					
					●		8		
● 38% Passing No. 200 Sieve.									
Santa Clara Formation: Reddish brown, Claystone and Sandstone, moist, fine to coarse grained sand, fine to coarse grained angular to subangular gravel, roots, black oxide staining, very severly weathered, friable.	Soft	BR				68	7		
				5					
						60	13		
						78	8		
Bottom of Boring at 8 feet									
				10					
				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-1 **BORING EB-1**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AS

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 698' **DATE DRILLED:** 09/09/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Road Gravel				0					
Santa Clara Formation: Reddish brown, Claystone and Sandstone, moist, fine to coarse grained sand, fine to coarse grained angular to subanguler gravel, roots, black oxide staining, very severely weathered, friable.	Soft	BR				56	12		
						85	12		
				5		54	15		
						60	16		
Bottom of Boring at 7.8 feet									
				10					
				15					
Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.									
*Measured using Torvane and Pocket Penetrometer devices.				20					

EXPLORATORY BORING LOG EB-2 **BORING EB-2**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS

DRILL TYPE: Minuteman with 3-1/4" Continuous Flight Auger **LOGGED BY:** AS

DEPTH TO GROUND WATER: Not Encountered **SURFACE ELEVATION:** 699' **DATE DRILLED:** 09/09/19

CLASSIFICATION AND DESCRIPTION	SOIL CONSISTENCY/ DENSITY or ROCK HARDNESS* (Figure A-2)	SOIL TYPE	SOIL SYMBOL	DEPTH (FEET)	SAMPLE INTERVAL	PEN. RESISTANCE (Blows/ft)	WATER CONTENT (%)	SHEAR STRENGTH (TSF)*	UNCONFIN. COMP. (TSF)*
Road Gravel				0					
Santa Clara Formation: Reddish brown, Claystone and Sandstone, moist, fine to coarse grained sand, fine to coarse grained angular to rounded gravels, roots, black oxide staining, very severeley weathered, friable.	Soft	BR				38	12		
						49	14		
				5		31	9		
▲ Free Swell = 40%.					▲	50	12		
				10		70	14		
Bottom of Boring at 10 feet									
				15					
				20					

Note: The stratification lines represent the approximate boundary between soil and rock types, the actual transition may be gradual.

*Measured using Torvane and Pocket Penetrometer devices.

EXPLORATORY BORING LOG EB-3 **BORING EB-3**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS

APPENDIX B

LABORATORY TESTS

Samples collected during subsurface exploration were selected for tests to help evaluate the physical and engineering properties of the soils and bedrock that was encountered. The tests that were performed are briefly described below.

The natural moisture content was determined in accordance with ASTM D2216 on nearly all of the samples recovered from the borings. This test determines the moisture content, representative of field conditions, at the time the samples were collected. The results are presented on the boring logs at the appropriate sample depths.

A free swell test was performed on one sample of the weathered bedrock recovered from Boring EB-3. The result is presented on the log of Boring EB-3 at the appropriate sample depth.

❖ ❖ ❖ ❖ ❖

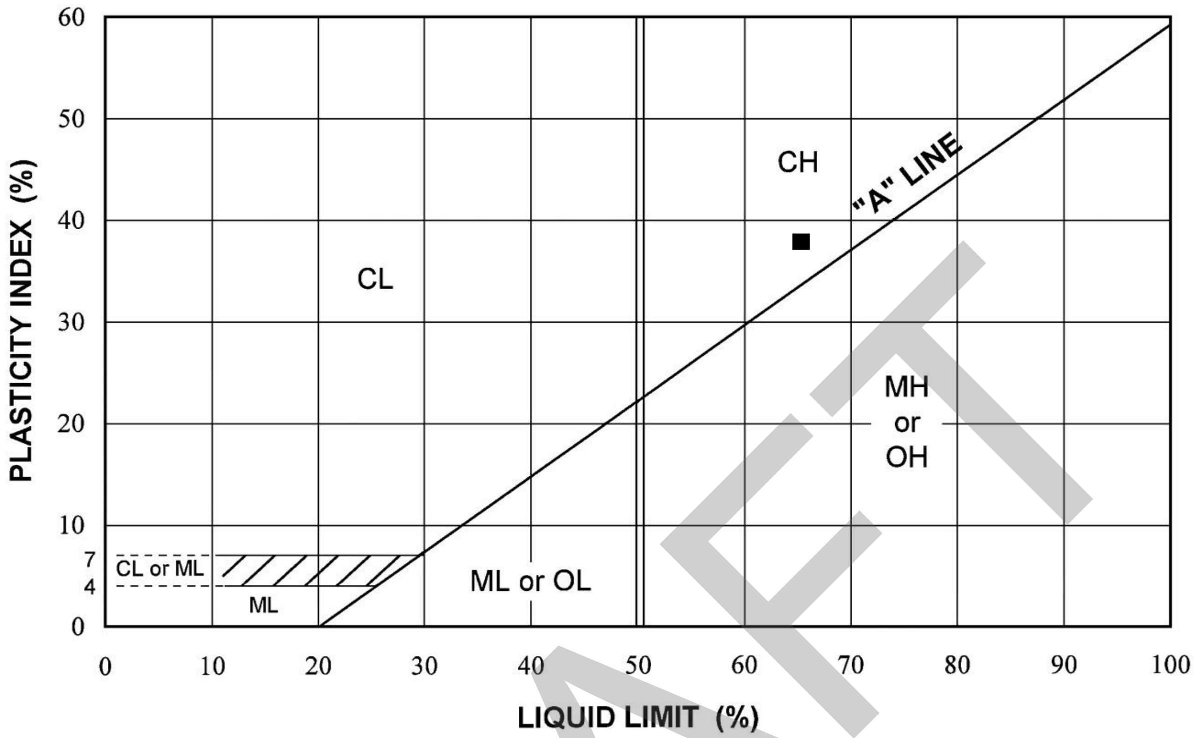


Chart Symbol	Boring Number	Sample Depth (feet)	Water Content (percent)	Liquid Limit (percent)	Plasticity Index (percent)	Liquidity Index (percent)	Passing No. 200 Sieve (percent)	USCS Soil Classification
■	EB-X	2-4						

PLASTICITY CHART **FIGURE B-1**

MIDPENINSULA REGIONAL OPEN SPACE BEATTY PROPERTY HOME OCTOBER 2019

LOS GATOS, CALIFORNIA PROJECT NO. 4907-3

ROMIG ENGINEERS

Attachment 3

DRAFT

ROMIG ENGINEERS, INC.
1390 El Camino Real, 2nd Floor
San Carlos, California 94070
Phone: (650) 591-5224
www.romigengineers.com

EXHIBIT D

Asbestos and Lead Survey

by Terracon Consultants, Inc.

Asbestos & Lead Survey

Three Buildings
Beatty House, La Honda White Barn, and La Honda Log Cabin
Midpeninsula Regional Open Space District

August 20, 2019
Revised November 14, 2019

Terracon Project No. R1197192

Prepared for:
ZFA Structural Engineers
San Carlos, CA 94070

Prepared by:
Terracon Consultants, Inc.
Emeryville, CA

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Terracon Consultants, Inc. (Terracon) conducted a pre-renovation asbestos and lead survey of three buildings, the Beatty House, La Honda White Barn, and La Honda Log Cabin near La Honda, California. We understand this asbestos survey was requested in support of the planned renovation of the building(s). The purpose of this survey was to sample and identify suspect materials and provide information regarding the identity, location, condition, and approximate quantities of asbestos containing materials (ACM), lead containing paint, mercury containing switches and light fixtures, PCB containing lighting ballasts and ozone depleting coolants. The survey was performed on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors in general accordance with the sampling protocols established in United State Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act, (AHERA). Terracon collected 89 bulk samples from homogeneous areas of suspect ACM.

Terracon collected seventy (70) samples from twenty-two (22) homogeneous area of suspected asbestos-containing materials (ACM). Laboratory analysis reported that seven (7) samples and two (2) materials contain asbestos.

Terracon collected two (2) paint chip samples from the La Honda Log cabin, one (1) from the La Honda White Barn, and six (6) from the Beatty House. Analysis of the paint samples reported that all of paint-chip samples had detectable concentrations of lead. One (1) sample from the La Honda White Barn and three (3) samples from the Beatty House had lead concentrations in excess of the California Department of Public Health definition of Lead-Based Paint.

HAZARDOUS MATERIALS SURVEY
ZFA - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin
Midpeninsula Regional Open Space District
Terracon Project No. R1197192
43697

1.0 INTRODUCTION

Terracon Consultants, Inc. (Terracon) was contracted by ZFA Structural Engineers (ZFA) to conduct a hazardous materials survey of three buildings owned by the Midpeninsula Regional Open Space District, including the Beatty House near Los Gatos and the La Honda White Barn and La Honda Log Cabin near La Honda, California. The survey was conducted on July 2, 2019 by Mike Harrington and Mike Reed, asbestos inspectors. The survey included the interior and exterior building components. Homogeneous areas of suspect asbestos-containing materials (ACM), lead-containing paints, PCB containing lighting ballasts, mercury containing thermostats, and mercury containing lighting tubes were visually identified and documented. Although reasonable effort was made to survey accessible suspect materials, additional suspect but un-sampled materials could be located in walls, in voids or in other concealed areas.

1.1 Scope of Work

The scope of the survey was as follows:

- Inspect the subject buildings for the presence of suspect ACMs, lead-containing paint, mercury-containing products, polychlorinated biphenyl lighting ballasts.
- Collect samples of suspect ACMs following a National Emissions Standards for Hazardous Air Pollutants (NESHAPS) protocol for sample collection for a demolition survey.
- Asbestos bulk samples will be analyzed using polarized light microscopy (PLM) in accordance with the EPA's July 1993 method for the determination of asbestos in bulk building materials - EPA 600/R-93/116.
- Collect bulk paint chip samples of primary painted surfaces and other materials suspected to be lead containing. Bulk samples will be analyzed at an accredited laboratory by Flame Atomic Absorption (AA) for Total Lead reported in parts per million (ppm).
- Submit written report including analytical results, regulatory requirements and conclusions.

The subject spaces included in the scope of were limited to:

- The interior and exterior of the Beatty House,
- The interior and exterior of the La Honda Log Cabin, and

- The interior and exterior of the La Honda White Barn.

2.0 ASBESTOS AND LEAD SURVEY

The survey was conducted by Mike Harrington and Mike Reed, asbestos inspectors. Mike Harrington is certified by the Division of Occupational Safety and Health (Cal/OSHA) as a Site Surveillance Technician (SST # 01-3017). Mike Reed is also certified by Cal/OSHA (SST # 08-4464). The survey was managed and supervised by Michael Benefield. Mr. Benefield is certified by Cal/OSHA as a Certified Asbestos Consultant (CAC # 06-3938). Terracon's project personnel's certifications can be found in Appendix E of this report. The survey was conducted in general accordance with the sampling protocols outlined in United States Environmental Protection Agency (USEPA) 40 Code of Federal Regulations (CFR) Part 763 Subpart E 763, known as the Asbestos Hazard Emergency Response Act (AHERA). Samples were delivered to an accredited laboratory for analysis by Polarized Light Microscopy (PLM).

2.1 Visual Assessment of Suspect ACM

Survey activities were initiated with visual observation of the interior and exterior of the building to identify homogeneous areas of suspect ACM. A homogeneous area (HA) consists of building materials that appear similar throughout in terms of color and texture with consideration given to the date of application. Interior assessment was conducted in visually accessible areas of the building proposed for demolition.

Terracon typically investigated for flooring beneath carpeting by lifting small corner sections of carpet. If additional flooring was seen, they have been identified in the report. If flooring was not seen at corners under the carpet, it does not imply that there are no tiles beneath the carpeted floor. Terracon inspected the walls in multiple places throughout the building and did not observe additional coverings/layers except where noted in this report, but there may be areas of additional suspect material present within the building walls not investigated. Terracon did not inspect in concealed wall cavities or in sub grade areas.

2.2 Bulk Sampling Suspect ACM

Bulk samples were collected of homogeneous suspect materials that were within the area covered by the scope of work. A homogeneous material is defined as a surfacing material, thermal system insulation, or miscellaneous material that is uniform in color, texture and age of construction. Examples of homogeneous materials include:

- Pipe insulation produced by the same manufacturer and installed during the same time period;
- Resilient flooring of identical color and pattern;

- Troweled on surfacing materials located in contiguous areas.

The buildings were visually inspected for the presence of suspect materials. As materials were identified, bulk samples were obtained with the aid of a coring device or other hand tool and placed into individual sampling bags. Each sample was given a discreet identification number and recorded on field notes as well as chain of custody forms. Refer to accompanying tables and appendices for details on material sample locations and results.

2.3 Physical Assessment of Suspect ACM

A physical assessment of each homogeneous area (HA) of suspect ACM was conducted to assess the friability and condition of the materials. A friable material is defined by the USEPA as a material which can be crumbled, pulverized or reduced to powder by hand pressure when dry. Friability was assessed by physically touching suspect materials.

2.4 Sample Analysis of Suspect ACM

Bulk samples of suspect ACM were analyzed by EM Lab P&K of Phoenix, AZ. EML is accredited under the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program (NVLAP). Analysis was conducted by Polarized Light Microscopy (PLM) in accordance with EPA 600/R92-116 (1993) method. Asbestos content was determined by visual estimation. The lower quantitation limit of PLM is recognized to be 1%. To reliably determine that a material in which asbestos was detected by PLM, contains less than 1% asbestos the samples must be re-analyzed by PLM Point Count. In accordance with EPA assessment criteria, if a single sample of a homogeneous material tests positive for asbestos, all areas of that homogeneous material are considered to be asbestos-containing.

2.5 Bulk Sampling of Lead Paint and Suspect Bulk Materials

Paint chip and bulk samples were collected using a hand scraper or chisel and were placed into individual plastic sampling containers. Each sample was provided a discreet sample number, which was recorded on a chain of custody form. The samples were transported under chain of custody procedures to J3 Resources of Pasadena, TX. Please refer to Table III for details on sample locations and sample results. All paint and ceramic tile glazing samples were analyzed for lead content using the Flame Atomic Absorption spectroscopy in accordance to EPA Method SW846-7420.

3.0 FINDINGS AND RECOMMENDATIONS

3.1 Asbestos

The following asbestos-containing materials were identified as a result of laboratory analysis or assumed to be asbestos containing:

HM # / Material Description	General Material Location	NESHAP Category	Asbestos Type	Estimated Quantity
Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360
Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% chrysotile composite	3,700

NA = Not Applicable, CH = Chrysotile, lf = linear feet, sf = square feet, RACM = Regulated asbestos containing material (friable), Cat. I = Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), Cat. II = Category II Non-friable (note ACM must be reclassified as a RACM if rendered friable during removal), sf = square feet, lf = linear feet

No asbestos was detected in any of the samples collected in the La Honda Log Cabin or in the La Honda White Barn. No identified materials were unable to be sampled and assumed to contain asbestos in any of the three buildings.

Vinyl sheet flooring in the Beatty House Living Room is friable ACM. Friable ACM is Regulated Asbestos-Containing Material (RACM) and must be removed prior to start of demolition or renovation activities. The wallboard system in the Beatty House has ACM joint compound. Composite analysis of the joint compound and the wallboard by PLM point count reported that the composite contained less than 1% asbestos. This material is not an ACM as defined by NESHAP and BAAQMD. However, Cal/OSHA does not allow composite analysis, so the joint compound is an ACM as defined by Cal/OSHA. All removal of ACM materials including materials non-friable materials left in the building must be conducted by a licensed and registered asbestos abatement contractor in accordance with 8CCR1529 and the BAAQMD Regulation 11 Rule 2. If additional suspect materials that have not been characterized in this report are discovered during demolition, these materials must be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.

A summary of the classification, condition and approximate quantity of identified ACM is presented in Appendix A. The summary of sample locations is presented in Appendix B. Laboratory analytical reports are included in Appendix C.

3.2 Lead-Containing Paints and Materials

Nine (9) painted surfaces were sampled and analyzed for potential lead content. Nine (9) of the painted surfaces were found to contain lead content above the laboratory detection limit. Four (4) painted surfaces were found to contain lead in concentrations exceeding 5,000 parts per million. The laboratory results for lead testing are summarized in Table III below.

TABLE III
LEAD SAMPLE RESULTS

Sample Number	Material Description and Location	Results mg/kg (ppm)	Lead-Containing	Lead-Based Paint
L-01	La Honda Log Cabin: Green paint on wood floor in the Log Cabin Kitchen	4,200	Y	N
L-02	La Honda Log Cabin: White paint on glass and wood on the Log Cabin south exterior	780	Y	N
L-03	La Honda White Barn:	48,000	Y	Y
L-04	Beatty House: Brown paint on wood exterior wall	1,500	Y	N
L-05	Beatty House: White paint on wood window frame	1,800	Y	N
L-06	Beatty House: White paint on wallboard wall in the living room	18,000	Y	Y
L-07	Beatty House: Brown paint on wood door frame between living room and kitchen	12,000	Y	Y
L-08	Beatty House: White paint on wood door frame in the kitchen	460	Y	N
L-09	Beatty House: White paint on glass and window frame on the exterior	43,000	Y	Y

mg/kg= Milligram per kilogram, ppm = parts per million

Disturbance of lead-containing paints and materials must be conducted in accordance with the requirements of Cal/OSHA (8CCR1532.1). Disturbance of lead-based paints must be conducted in accordance with the EPA RRP rule.

4.0 REGULATORY SUMMARY

4.1 Asbestos

Disturbance of materials containing asbestos is regulated by Cal-OSHA in the Asbestos in Construction Industry Standard, 8 CCR 1529. Some of the key requirements are summarized below.

- Any individual who contracts to provide health and safety services relating to materials containing more than 0.1% asbestos must be certified by Cal-OSHA as either a Certified Asbestos Consultant or a Site Surveillance Technician. The activities that require certification include: conducting asbestos surveys; writing work plans or specifications for abatement; monitoring the work of abatement contractors; collecting air samples; and determining if the work area is safe for re-occupancy by non-asbestos workers. Regulation: Cal-OSHA 8 CCR 1529 (q)(1).
- If more than 100 square feet of materials that contain greater than 0.1% asbestos will be disturbed, the materials must be removed by a Cal-OSHA registered asbestos abatement contractor. Regulation: Cal-OSHA 8 CCR 1529 (r).
- ACMs that are classified by OSHA as thermal system insulation/surfacing materials are present. Removal of these materials is considered a Class I activity according to Cal-OSHA regulations. Work practices and engineering controls for Class I work are specified in Cal-OSHA 8 CCR 1529 (g) (4-6).
- ACMs that are classified by OSHA as other/miscellaneous materials are present. Removal of these materials is considered a Class II activity according to Cal-OSHA regulations. Work practices and engineering controls for Class II work are specified in Cal-OSHA 8 CCR 1529 (g) (7-8).
- Removal of friable ACMs greater than 100 square feet or 100 linear feet requires notification of the Bay Area Air Quality Management District ten (10) working days in advance of intended removal.
- Friable ACM waste must be manifested, transported, and disposed of as hazardous waste in accordance with the Department of Toxic and Substances Control (DTSC) and under a Waste Shipment Record as required by the Bay Area Air Quality Management District. DTSC regulates disposal of asbestos waste. DTSC issues U.S. EPA hazardous waste generator identification numbers.

4.2 Lead

Disturbing materials containing any detectable concentration of lead either through repair, maintenance, renovation or demolition activities triggers several regulations enforced by such agencies as OSHA (worker protection), EPA (environmental exposure, transportation and

disposal), and Department of Public Health (DPH). Some of the key requirements of the regulations are summarized below.

- There are presently no federal, state or local regulations limiting the concentration of lead in public sector buildings, however several regulations established for the private sector as well as for government subsidized housing are used industry wide as guidelines for assessing exposure to lead. The Consumer Product Safety Commission (CPSC) has set a maximum limit of 90 ppm in paint used for residential purposes. The Department of Housing and Urban Development (HUD) requires abatement of lead hazards involving paint in concentrations exceeding 5,000 ppm.
- Disposal of all lead-containing materials is regulated at concentrations at or exceeding 1,000 ppm as stated in 40 Code of Federal Regulations (CFR) Part 263 - Land Disposal Regulations and Title 22, Division 4 Environmental Health of the California Administrative Code. Lead containing materials that exceed 50 ppm must be additionally analyzed to determine possible waste disposal restrictions with respect to lead.
- Federal OSHA and Cal-OSHA regulate all worker exposure during construction activities that impact lead-containing paint. Cal-OSHA enforces the Lead in Construction Standard in Title 8 CCR 1532.1. The scope covers construction work where employees may be exposed to lead during such activities as demolition, removal, surface preparation for re-painting, renovation, clean-up and routine maintenance. The OSHA specified method of compliance includes respiratory protection, protective clothing and equipment, housekeeping, hygiene facilities, medical surveillance, and training, among other requirements.

5.0 LIMITATIONS/GENERAL COMMENTS

Terracon did not perform sampling which required demolition or destructive activities such as knocking holes in walls, dismantling of equipment or removal of protective coverings. Reasonable efforts to access suspect materials within known areas of restricted access (e.g., crawl spaces) were made; however, confined spaces or areas which may pose a health or safety risk to Terracon personnel were not sampled. Sampling did not include suspect materials which could not be safely reached with available ladders/man-lifts.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon the survey results, Terracon concludes the following:

- Asbestos was detected in various materials including vinyl floor tile and mastics, joint compound associated with drywall, thermal system insulation, ceramic tile mastic, sink undercoating, roof mastics, transite (asbestos cement) panels, metal roof cap sealant, and flashing sealant.
- If additional suspect materials that have not been characterized as ACM or non-ACM in this report are discovered during demolition, these materials should be assumed to contain asbestos and be treated accordingly until proven otherwise by appropriate sampling and laboratory analysis.
- Lead was detected above the laboratory detection limit on nine (9) various painted surfaces throughout the building. Two (2) of the painted surfaces had lead concentrations above 5,000 ppm, the threshold for designation of lead-based paint.

This asbestos survey was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our survey of the building. The information contained in this report is relevant to the date on which this survey was performed and should not be relied upon to represent conditions at a later date. This report has been prepared on behalf of and exclusively for use by ZFA Structural Engineers for specific application to their project as discussed. This report is not a bidding document. Contractors or consultants reviewing this report must draw their own conclusions regarding further investigation or remediation deemed necessary. Terracon does not warrant the work of regulatory agencies, laboratories or other third parties supplying information which may have been used in the preparation of this report. No warranty, express or implied is made.

APPENDIX A
ZFA Structural Engineers - Three Buildings Pre-Renovation Survey
Beatty House, La Honda White Barn, and La Honda Log Cabin, Near

IDENTIFIED ASBESTOS CONTAINING MATERIALS BY HOMOGENEOUS AREA (HA)

HA No.	Material Description	Material Location	NESHAP Classification	% and Type Asbestos**	Estimated Quantity*
201	Tan vinyl sheet flooring	Beatty House: Living room	Friable – RACM	25% Chrysotile	360 SF
204	Wallboard joint compound	Beatty House: Throughout, walls and ceilings	NA	2% Chrysotile in the joint compound, and 0.5% Chrysotile composite	3,700 SF

***Estimated quantities** are based on a cursory field evaluation, and actual quantities may vary significantly, especially if asbestos containing materials are present in hidden and/or inaccessible areas not evaluated as part of this survey.
****% & Type Asbestos** = this column contains both the analytical result of the sample with the highest concentration of asbestos detected in the samples that make up the HA and the types of asbestos identified.

The materials listed in this table have been sampled and determined to contain asbestos in concentrations greater than 1%. When disturbed, various federal, state and local regulations may apply. These materials should be monitored for damage over time and repaired as necessary by appropriately trained personnel. Removal may be necessary before renovations and in most cases before a demolition. See Appendix B for a summary of samples collected. See Appendix C for detailed analytical results.

APPENDIX B

ASBESTOS SAMPLE LOCATION SUMMARY

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
Log Cabin							
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected	NA	NA	
1	1A	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1B	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Tan Sheet Flooring with Fibrous Backing and Gray Paint	None detected			
1	1C	Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North	Brown Fibrous Material with Gray Paint	None detected			
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected	NA	NA	
2	2A	Flooring-Lino Green Square Pattern;Kitchen-West	Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
2	2B	Flooring-Lino Green Square Pattern;Kitchen-West	Orange Wood	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Green Sheet Flooring with Fibrous Backing	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Light Brown Mastic	None detected			
2	2C	Flooring-Lino Green Square Pattern;Kitchen-West	Dark Brown Mastic	None detected			
3	3A	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected	NA	NA	
3	3B	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
3	3C	Window Glaze;Ext Window Glaze-South Glass to Frame	White Window Glazing	None detected			
4	4A	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected	NA	NA	
4	4B	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
4	4C	Fireplace Brick /Mortar;Living Rm -South	Off-White Mortar	None detected			
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected	NA	NA	
5	5A	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5B	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Black Roofing Felt	None detected			
5	5C	Roof Felt Double Layer Under Wood Shingle;Roof	Tan Fibrous Material	None detected			
6	6A	Wiring Black;Cabin	Black Coating	None detected	NA	NA	
6	6A	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6B	Wiring Black;Cabin	Black Coating	None detected			
6	6B	Wiring Black;Cabin	White Wiring Insulation	None detected			
6	6C	Wiring Black;Cabin	Black Coating	None detected			
6	6C	Wiring Black;Cabin	White Wiring Insulation	None detected			
7	7A	Concrete Foundation;Under Porch	White Concrete	None detected	NA	NA	
7	7B	Concrete Foundation;Under Porch	White Concrete	None detected			
7	7C	Concrete Foundation;Under Porch	White Concrete	None detected			
8	8A	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected	NA	NA	
8	8A	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8B	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8B	Wiring-White 1/8 in;Interior	Black Coating	None detected			
8	8C	Wiring-White 1/8 in;Interior	Yellow Wiring Insulation	None detected			
8	8C	Wiring-White 1/8 in;Interior	Black Coating	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
9	9A	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9A	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9B	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Black Coating	None detected			
9	9C	Wiring-Black 1/4 in;Cabin	Brown Wiring Insulation	None detected			
Barn							
100	100A	Wiring;Black 1/8 In;Interior Barn;N	Black Wiring Insulation	None detected	NA	NA	
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Wiring Insulation	None detected			
100	100B	Wiring;Black 1/8 In;Interior Barn;C	Black Tar Insulator	None detected			
100	100C	Wiring;Black 1/8 In;Interior Barn;S	Black Wiring Insulation	None detected			
Beatty House							
200	200A	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected	NA	NA	
200	200B	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
200	200C	Window Putty; Ext Windows	Off-White Window Putty with White Paint	None detected			
201	201A	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**	**Friable**	**Class 2**	**360 SF**
201	201A	Flooring Lino Tan; Living Rm	Black Felt	None detected	**RACM**		
201	201A	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201B	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201B	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201B	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
201	201C	Flooring Lino Tan; Living Rm	**Tan Linoleum with Fibrous Backing**	**25% Chrysotile**			
201	201C	Flooring Lino Tan; Living Rm	Black Felt	None detected			
201	201C	Flooring Lino Tan; Living Rm	Gray Fibrous Material	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected	NA	NA	
202	202A	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202A	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202B	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Multicolored Linoleum with Fibrous Backing	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Black Felt	None detected			
202	202C	Flooring Multi Layer; Back Room; 4	Gray Fibrous Material	None detected			
203	203A	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected	NA	NA	
203	203B	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			
203	203C	Flooring Dark Gray Flower Pat; Bedroom 1	Dark Gray Linoleum with Fibrous Backing	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
204	204A	Wallboard Joint Compound; Hall	Gray Fibrous Material with Multilayered Paint	None detected	**NA**	**Class 2**	**3,700 SF**
204	204A	Wallboard Joint Compound; Hall	White Drywall with Brown Paper and Multilayered Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Fibrous Material with White Paint	None detected			
204	204B	Wallboard Joint Compound; Ceil; Living Rm	Brown Drywall with Brown Paper	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Fibrous Material with White Paint	None detected			
204	204C	Wallboard Joint Compound; Ceil; Back; 4	Brown Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Tan Joint Compound with Multilayered Paint**	**2% Chrysotile**			
204	204D	Wallboard Joint Compound; RR; West	White Drywall with Brown Paper	None detected			
204	204D	Wallboard Joint Compound; RR; West	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204E	Wallboard Joint Compound; East	Brown/Green Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	Cream Tape	None detected			
204	204E	Wallboard Joint Compound; East	**Tan Joint Compound**	**2% Chrysotile**			
204	204E	Wallboard Joint Compound; East	White Drywall with Brown Paper	None detected			
204	204E	Wallboard Joint Compound; East	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204F	Wallboard Joint Compound; South	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	Cream Tape	None detected			
204	204F	Wallboard Joint Compound; South	**Tan Joint Compound**	**2% Chrysotile**			
204	204F	Wallboard Joint Compound; South	White Drywall with Brown Paper	None detected			
204	204F	Wallboard Joint Compound; South	**Composite by PLM Point Count**	**<0.25% Chrysoltile**			
204	204G	Wallboard Joint Compound; North	**Tan Compound with Multilayered Paint**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	Cream Tape	None detected			
204	204G	Wallboard Joint Compound; North	**Tan Joint Compound**	**2% Chrysotile**			
204	204G	Wallboard Joint Compound; North	White Drywall with Brown Paper	None detected			
204	204G	Wallboard Joint Compound; North	**Composite by PLM Point Count**	**0.5% Chrysotile**			
205	205A	Flooring Hallway Gray; Hall; West	Black Felt with Pebbles and Gray Surface	None detected	NA	NA	
205	205B	Flooring Hallway Gray; Hall; Center	Black Felt with Pebbles and Gray Surface	None detected			
205	205C	Flooring Hallway Gray; Hall; East	Black Felt with Pebbles and Gray Surface	None detected			
206	206A	Cove Base/Flooring Creme Yellow Mastic; Kitchen; West	Cream Mastic with Yellow Paint	None detected	NA	NA	
206	206B	Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center	Cream Mastic with Yellow Paint	None detected			
206	206C	Cove Base/Flooring Creme Yellow Mastic; Kitchen; East	Cream Mastic with Yellow Paint	None detected			
207	207A	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected	NA	NA	
207	207B	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
207	207C	Flooring Peach/Tan; Bedroom 2	Brown/Beige Linoleum with Fibrous Backing	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Tan Linoleum with Fibrous Backing	None detected	NA	NA	
208	208A	Flooring Lino Tan; Kitchen; West	White Mastic	None detected			
208	208A	Flooring Lino Tan; Kitchen; West	Brown Fiberboard Flooring	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	Tan Linoleum with Fibrous Backing	None detected			
208	208B	Flooring Lino Tan; Kitchen; Center	White Mastic with Brown Fibrous Material	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Tan Linoleum with Fibrous Backing	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	White Mastic	None detected			
208	208C	Flooring Lino Tan; Kitchen; East	Brown Fiberboard Flooring	None detected			

Asbestos Samples Summary

Material	Sample	Sample Location	Description	Asbestos Content	NESHAP Category	OSHA Work Class	Material Quantity
209	209A	Flooring Creme/Tan; Bath; East	Tan Flooring	None detected	NA	NA	
209	209A	Flooring Creme/Tan; Bath; East	Semi-Transparent Adhesive	None detected			
209	209A	Flooring Creme/Tan; Bath; East	Black Felt with Gray Coating	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Tan Flooring	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Semi-Transparent Adhesive	None detected			
209	209B	Flooring Creme/Tan; Bath; Center	Black Felt with Gray Coating	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Tan Flooring	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Semi-Transparent Adhesive	None detected			
209	209C	Flooring Creme/Tan; Bath; West	Black Felt with Gray Coating	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Shingle with Green Pebbles	None detected	NA	NA	
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Tar	None detected			
210	210A	Roofing; Shingles; Green; Roof; NW	Black Roofing Felt	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Shingle with Green Pebbles	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Tar	None detected			
210	210B	Roofing; Shingles; Green; Roof; SW	Black Roofing Felt	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Shingle with Green Pebbles	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Tar	None detected			
210	210C	Roofing; Shingles; Green; Roof; West	Black Roofing Felt	None detected			
211	211A	Concrete Porch	Gray Concrete	None detected	NA	NA	
211	211B	Concrete Porch	Gray Concrete	None detected			
211	211C	Concrete Porch	Gray Concrete	None detected			

APPENDIX C

ASBESTOS ANALYTICAL LABORATORY DATA

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin
EML ID: 2198987

Approved by:

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	27
Total Samples Analyzed:	27
Total Samples with Layer Asbestos Content > 1%:	0

Location: 1A, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447612-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1B, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447613-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 1C, Flooring-Lino 1x1 Squares Tan/Beige;Restroom-North

Lab ID-Version‡: 10447614-1

Sample Layers	Asbestos Content
Tan Sheet Flooring with Fibrous Backing and Gray Paint	ND
Brown Fibrous Material with Gray Paint	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 2A, Flooring-Lino Green Square Pattern;Kitchen-West

Lab ID-Version‡: 10447615-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Brown Mastic	ND
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 2B, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447616-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Orange Wood	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 2C, Flooring-Lino Green Square Pattern;Kitchen-West Lab ID-Version‡: 10447617-1

Sample Layers	Asbestos Content
Green Sheet Flooring with Fibrous Backing	ND
Light Brown Mastic	ND
Dark Brown Mastic	ND
Composite Non-Asbestos Content:	25% Cellulose
Sample Composite Homogeneity:	Poor

Location: 3A, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447618-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 3B, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447619-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 3C, Window Glaze;Ext Window Glaze-South Glass to Frame Lab ID-Version‡: 10447620-1

Sample Layers	Asbestos Content
White Window Glazing	ND
Sample Composite Homogeneity:	Good

Location: 4A, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447621-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4B, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447622-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Location: 4C, Fireplace Brick /Mortar;Living Rm -South Lab ID-Version‡: 10447623-1

Sample Layers	Asbestos Content
Off-White Mortar	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 5A, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447624-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5B, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447625-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 5C, Roof Felt Double Layer Under Wood Shingle;Roof Lab ID-Version‡: 10447626-1

Sample Layers	Asbestos Content
Black Roofing Felt	ND
Tan Fibrous Material	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6A, Wiring Black;Cabin Lab ID-Version‡: 10447627-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 6B, Wiring Black;Cabin

Lab ID-Version‡: 10447628-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 6C, Wiring Black;Cabin

Lab ID-Version‡: 10447629-1

Sample Layers	Asbestos Content
Black Coating	ND
White Wiring Insulation	ND
Composite Non-Asbestos Content:	95% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 7A, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447630-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 7B, Concrete Foundation;Under Porch

Lab ID-Version‡: 10447631-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 7C, Concrete Foundation;Under Porch Lab ID-Version‡: 10447632-1

Sample Layers	Asbestos Content
White Concrete	ND
Sample Composite Homogeneity:	Good

Location: 8A, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447633-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8B, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447634-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 8C, Wiring-White 1/8 in;Interior Lab ID-Version‡: 10447635-1

Sample Layers	Asbestos Content
Yellow Wiring Insulation	ND
Black Coating	ND
Composite Non-Asbestos Content:	70% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-La Honda Redwood Cabin

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 9A, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447636-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9B, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447637-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 9C, Wiring-Black 1/4 in;Cabin Lab ID-Version‡: 10447638-1

Sample Layers	Asbestos Content
Black Coating	ND
Brown Wiring Insulation	ND
Composite Non-Asbestos Content:	60% Cellulose
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

Attachment 3

002198987

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com ☐PM – T. Kattchee takattchee@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET** ☒ PLM Analysis (Analyze all samples) ☐ Stop Analysis at First Positive ☐ Point Count Analysis (1000-point)
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	
☐PM – W. Frieszell wmfrieszell@terracon.com			PAGE 1 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3 -4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*

***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 1	***Material Description –*** Flooring – Lino 1X1 Squares TAN/Beige	
Sample ID	***Sample Location & Material Location***	***Quantity:*** 120
1A	Rest Room – North	10X12
1B	|	
1C	|	
HM# 2	***Material Description-*** Flooring – Lino Green Square Pattern	
Sample ID	***Sample Location & Material Location***	***Quantity:*** 625
2A	Kitchen – West	25X25
2B	|	
2C	|	
HM# 3	Material Description- window Glaze	
Sample ID	***Sample Location & Material Location***	***Quantity:*** 18ea 300 LF
3A	ext window Glaze - South Glass to Frame	
3B	|	
3C	|	
HM# 4	***Material Description*** Fire place Brick / mortar	
Sample ID	***Sample Location & Material Location***	***Quantity:*** 1500 SF
4A	Living Rm – South	
4B	|	
4C	|	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 950
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

002198987

Attachment 3

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com
	☐PM – T. Kattchee takattchee@terracon.com	
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com		

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 2 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# RI197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-5DAY

*****FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 5	Material Description – Roof felt Double Layer under wood Shingle	
Sample ID	**Sample Location & Material Location**	**Quantity:**
5A	Roof	
5B	|	
5C	|	

HM# 6	Material Description- Wiring Black 3/4	
Sample ID	**Sample Location & Material Location**	**Quantity:**
6A	cabin	
6B	|	
6C	|	

HM# 7	Material Description- concrete foundation	
Sample ID	**Sample Location & Material Location**	**Quantity:**
7A	under Porch	
7B	|	
7C	|	

HM# 8	Material Description Wiring – White 7/8 in	
Sample ID	**Sample Location & Material Location**	**Quantity:**
8A	Interior	
8B	|	
8C	|	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 95
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

Attachment 3

002198987

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kaltchee takaltchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 3

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3 # DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 9	Material Description – wiring – Black 1/4 in	
Sample ID	Sample Location & Material Location	Quantity:
9A	cabin	
9B	|	
9C	|	

HM#	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:

HM#	Material Description-	
Sample ID	Sample Location & Material Location	Quantity:

HM#	Material Description	
Sample ID	Sample Location & Material Location	Quantity:

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 95c
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structural Engineers-LA Honda White Barn
EML ID: 2198983

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

REVISED REPORT

Dates of Analysis:
Asbestos PLM: 07-09-2019 and 07-10-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	3
Total Samples Analyzed:	3
Total Samples with Layer Asbestos Content > 1%:	0

Location: 100A, Wiring;Black 1/8 In;Interior Barn;N

Lab ID-Version‡: 10447309-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100B, Wiring;Black 1/8 In;Interior Barn;C

Lab ID-Version‡: 10447310-2

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Black Tar Insulator	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Location: 100C, Wiring;Black 1/8 In;Interior Barn;S

Lab ID-Version‡: 10447311-1

Sample Layers	Asbestos Content
Black Wiring Insulation	ND
Composite Non-Asbestos Content:	15% Cotton 4% Synthetic Fibers
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structural Engineers-LA Honda White Barn

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-10-2019

SUMMARY OF REVISIONS

Location: 100B; Wiring;Black 1/8 In;Interior Barn;C Lab ID-Version‡: 10447310-2
Analysis Time revised. Sample Layers revised.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

002198983

Attachment 3

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET**
	☐PM – T. Kattchee takattchee@terracon.com		☒ PLM Analysis (Analyze all samples)
☒PM- M. Benefield msbenefield@terracon.com	☐PM O. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	☐ Stop Analysis at First Positive
☐PM – W. Frieszell wmfrieszell@terracon.com			☐ Point Count Analysis (1000-point)
			PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- LA HONDA WHITE BARN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)*****
*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com ***

HM# 100	Material Description – Wiring – Black 1/8 in	
Sample ID	**Sample Location & Material Location**	**Quantity:** 80 LF
100A	Interior Barn – N	
100B	– C	
100C	– S	

HM# 101	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
101A		
101B		
101C		

HM# 102	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
102A		
102B		
102C		

HM# 103	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**
103A		
103B		
103C		

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 930
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2198988

Approved by:

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

Dates of Analysis:
Asbestos PLM: 07-08-2019

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Total Samples Submitted:	40
Total Samples Analyzed:	40
Total Samples with Layer Asbestos Content > 1%:	7

Location: 200A, Window Putty; Ext Windows

Lab ID-Version‡: 10447674-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200B, Window Putty; Ext Windows

Lab ID-Version‡: 10447675-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 200C, Window Putty; Ext Windows

Lab ID-Version‡: 10447676-1

Sample Layers	Asbestos Content
Off-White Window Putty with White Paint	ND
Sample Composite Homogeneity:	Good

Location: 201A, Flooring Lino Tan; Living Rm

Lab ID-Version‡: 10447677-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 201B, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447678-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 201C, Flooring Lino Tan; Living Rm Lab ID-Version‡: 10447679-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	25% Chrysotile
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cotton 15% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 202A, Flooring Multi Layer; Back Room; 4 Lab ID-Version‡: 10447680-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202B, Flooring Multi Layer; Back Room; 4

Lab ID-Version‡: 10447681-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 202C, Flooring Multi Layer; Back Room; 4 Lab ID-Version‡: 10447682-1

Sample Layers	Asbestos Content
Multicolored Linoleum with Fibrous Backing	ND
Multicolored Linoleum with Fibrous Backing	ND
Black Felt	ND
Gray Fibrous Material	ND
Composite Non-Asbestos Content:	30% Cellulose 12% Cotton 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 203A, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447683-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203B, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447684-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 203C, Flooring Dark Gray Flower Pat; Bedroom 1 Lab ID-Version‡: 10447685-1

Sample Layers	Asbestos Content
Dark Gray Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	35% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204A, Wallboard Joint Compound; Hall Lab ID-Version‡: 10447686-1

Sample Layers	Asbestos Content
Gray Fibrous Material with Multilayered Paint	ND
White Drywall with Brown Paper and Multilayered Paint	ND
Composite Non-Asbestos Content:	20% Cotton 10% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 204B, Wallboard Joint Compound; Ceil; Living Rm Lab ID-Version‡: 10447687-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204C, Wallboard Joint Compound; Ceil; Back; 4 Lab ID-Version‡: 10447688-1

Sample Layers	Asbestos Content
Brown Fibrous Material with White Paint	ND
Brown Drywall with Brown Paper	ND
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Moderate

Location: 204D, Wallboard Joint Compound; RR; West Lab ID-Version‡: 10447689-1

Sample Layers	Asbestos Content
Tan Joint Compound with Multilayered Paint	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Moderate

Comments: Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 204E, Wallboard Joint Compound; East Lab ID-Version‡: 10447690-1

Sample Layers	Asbestos Content
Brown/Green Paper	ND
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	20% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204F, Wallboard Joint Compound; South Lab ID-Version‡: 10447691-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Location: 204G, Wallboard Joint Compound; North Lab ID-Version‡: 10447692-1

Sample Layers	Asbestos Content
Tan Compound with Multilayered Paint	2% Chrysotile
Cream Tape	ND
Tan Joint Compound	2% Chrysotile
White Drywall with Brown Paper	ND
Composite Asbestos Fibrous Content:	< 1% Asbestos
Composite Non-Asbestos Content:	15% Cellulose
Sample Composite Homogeneity:	Poor

Comments: Composite asbestos content provided is only for Drywall/Joint compound. Composite content provided for this analysis has been performed by following the NESHAP guidelines.

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205A, Flooring Hallway Gray; Hall; West

Lab ID-Version‡: 10447693-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 205B, Flooring Hallway Gray; Hall; Center Lab ID-Version‡: 10447694-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 205C, Flooring Hallway Gray; Hall; East Lab ID-Version‡: 10447695-1

Sample Layers	Asbestos Content
Black Felt with Pebbles and Gray Surface	ND
Composite Non-Asbestos Content:	60% Cellulose 2% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 206A, Cove Base/Flooring Creme Yellow Mastic; Kitchen; West Lab ID-Version‡: 10447696-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 206B, Cove Base/Flooring Creme Yellow Mastic; Kitchen; Center Lab ID-Version‡: 10447697-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 206C, Cove Base/Flooring Creme Yellow Mastic; Kitchen; East Lab ID-Version‡: 10447698-1

Sample Layers	Asbestos Content
Cream Mastic with Yellow Paint	ND
Sample Composite Homogeneity:	Good

Location: 207A, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447699-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207B, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447700-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Location: 207C, Flooring Peach/Tan; Bedroom 2 Lab ID-Version‡: 10447701-1

Sample Layers	Asbestos Content
Brown/Beige Linoleum with Fibrous Backing	ND
Composite Non-Asbestos Content:	50% Cellulose 4% Hair/Wool
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 208A, Flooring Lino Tan; Kitchen; West Lab ID-Version‡: 10447702-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 208B, Flooring Lino Tan; Kitchen; Center Lab ID-Version‡: 10447703-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic with Brown Fibrous Material	ND
Composite Non-Asbestos Content:	20% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Moderate

Location: 208C, Flooring Lino Tan; Kitchen; East Lab ID-Version‡: 10447704-1

Sample Layers	Asbestos Content
Tan Linoleum with Fibrous Backing	ND
White Mastic	ND
Brown Fiberboard Flooring	ND
Composite Non-Asbestos Content:	50% Cellulose < 1% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 209A, Flooring Creme/Tan; Bath; East Lab ID-Version‡: 10447705-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 209B, Flooring Creme/Tan; Bath; Center — Lab ID-Version‡: 10447706-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 209C, Flooring Creme/Tan; Bath; West — Lab ID-Version‡: 10447707-1

Sample Layers	Asbestos Content
Tan Flooring	ND
Semi-Transparent Adhesive	ND
Black Felt with Gray Coating	ND
Composite Non-Asbestos Content:	25% Cellulose 3% Hair/Wool
Sample Composite Homogeneity:	Poor

Location: 210A, Roofing; Shingles; Green; Roof; NW — Lab ID-Version‡: 10447708-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Location: 210B, Roofing; Shingles; Green; Roof; SW — Lab ID-Version‡: 10447709-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Cellulose 10% Glass Fibers
Sample Composite Homogeneity:	Poor

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

EMLab P&K
1501 West Knudsen Drive, Phoenix, AZ 85027
(800) 651-4802 Fax (623) 780-7695 www.emlab.com

Client: Terracon Consultants, Inc. - Emeryville
C/O: Mr. Michael Benefield, PE
Re: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd

Date of Sampling: 07-02-2019
Date of Receipt: 07-05-2019
Date of Report: 07-08-2019

ASBESTOS PLM REPORT

Location: 210C, Roofing; Shingles; Green; Roof; West

Lab ID-Version‡: 10447710-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Shingle with Green Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	12% Glass Fibers 10% Cellulose
Sample Composite Homogeneity:	Poor

Location: 211A, Concrete Porch

Lab ID-Version‡: 10447711-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211B, Concrete Porch

Lab ID-Version‡: 10447712-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Location: 211C, Concrete Porch

Lab ID-Version‡: 10447713-1

Sample Layers	Asbestos Content
Gray Concrete	ND
Sample Composite Homogeneity:	Moderate

Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

002198988

Terracon

☐PM – S. Steiner sosteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kalitchee takaltchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 1 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 Sampled By: M.R & M.H Sampling Date: 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB ______ TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*

***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 200	Material Description – window Putty	
Sample ID	Sample Location & Material Location	Quantity: 200 LF
200A	Ext windows	14 windows
200B		3x4
200C		

HM# 201	Material Description- Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 360 S.F
201A	Living Rm	18x20
201B		
201C		

HM# 202	Material Description- Flooring multi layer	
Sample ID	Sample Location & Material Location	Quantity: 625 SF
202A	Back Room -4	25x25
202B		
202C		

HM# 203	Material Description flooring Dark Gray flower pat	
Sample ID	Sample Location & Material Location	Quantity: 320 S.F
203A	Bed room -1	16x20
203B		
203C		

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

Attachment 3

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com	☐PM – K. Schroeter kmschroeter@terracon.com	☐PM – K. Pilgrim kmpilgrim@terracon.com	**ACM BULK SAMPLE DATA SHEET**
	☐PM – T. Kattchee takattchee@terracon.com		☒ PLM Analysis (Analyze all samples)
☒PM- M. Benefield msbenefield@terracon.com	☐PM D. Block David.block@terracon.com	☐PM – D.WALLEN d.wallen@terracon.com	☐ Stop Analysis at First Positive
☐PM – W. Frieszell wmfrieszell@terracon.com			☐ Point Count Analysis (1000-point)
			PAGE 2 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB **TAT** ☐ Rush ☐ 24HRS ☒ 3-4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*

***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 204	Material Description – Wallboard Joint compound	
Sample ID	**Sample Location & Material Location**	**Quantity:**
204 A	Hall –	(480 SqFt House)
B	ceil – Living Rm	
C	ceil – Back Rm-4	

HM# 204	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
D	RR – West	
E	East	
F	South	

HM# 204	Material Description-	
Sample ID	**Sample Location & Material Location**	**Quantity:**
204G	North	

HM#	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 950
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

Attachment 3

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples) -
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 3 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB ____ TAT ☐ Rush ☐ 24HRS ☒ 3 4 DAY

FAX OR E-MAIL REPORT TO: *SEE ABOVE PROJECT MANAGER (PM)*
***ADDITIONAL REPORT RECIPIENT(S): mdharrington@terracon.com ***

HM# 205	Material Description – Flooring Hallway Gray	
Sample ID	Sample Location & Material Location	Quantity: 110 SF
205A	Hall – west	27X4
205 B	– center	
205C	– East	

HM# 206	Material Description- Cove base/ flooring Creme Yellow mastic	
Sample ID	Sample Location & Material Location	Quantity: 200 S.F
206A	Kitchen – west	14X4
206 B	– center	
206 C	– East	

HM# 207	Material Description- Flooring Peach/TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
207A	Bedroom 2 –	12X16
207 B	–	
207 C	–	

HM# 208	Material Description Flooring Lino TAN	
Sample ID	Sample Location & Material Location	Quantity: 200 SF
208A	Kitchen – West	14X14
208 B	– center	
208 C	– East	

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:	[signature]	Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

Attachment 3

002198988

Terracon

☐PM – S. Steiner spsteiner@terracon.com
☐PM – K. Schroeter kmschroeter@terracon.com
☐PM – K. Pilgrim kmpilgrim@terracon.com
☐PM – T. Kattchee takattchee@terracon.com
☒PM- M. Benefield msbenefield@terracon.com
☐PM D. Block David.block@terracon.com
☐PM – D.WALLEN d.wallen@terracon.com
☐PM – W. Frieszell wmfrieszell@terracon.com

ACM BULK SAMPLE DATA SHEET

☒ PLM Analysis (Analyze all samples)
☐ Stop Analysis at First Positive
☐ Point Count Analysis (1000-point)

PAGE 4 OF 4

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMABRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 07-2-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☒ EMLAB TAT ☐ Rush ☐ 24HRS ☒ 3-4 DAY

*****FAX OR E-MAIL REPORT TO:** ***SEE ABOVE PROJECT MANAGER (PM)*******

*****ADDITIONAL REPORT RECIPIENT(S):** mdharrington@terracon.com *****

HM# 209	Material Description – Flooring Creme / Tan	
Sample ID	**Sample Location & Material Location**	**Quantity:** 200 sf
209A	Bath – East	
209B	– center	
209C	– west	

HM# 210	Material Description- Roofing – shingles – Green	
Sample ID	**Sample Location & Material Location**	**Quantity:** 600 sf
210 A	Roof – NW	
210 B	– SW	
210 C	– west	

HM# 211	Material Description- concrete	
Sample ID	**Sample Location & Material Location**	**Quantity:**
211A	Porch –	
211B	–	
211C	–	

HM#	Material Description	
Sample ID	**Sample Location & Material Location**	**Quantity:**

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**	[signature]	**Date/ Time:**	7/5/19 FedEx 9:52
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

APPENDIX D

LEAD ANALYTICAL LABORATORY DATA

Attachment 3

EHS Laboratories

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Lead Paint Chip Analysis Report

Report Number: 19-07-01313

Client: Eurofins EMLab P&K
4101 Shuffel Street NW
North Canton, OH 44720

Received Date: 07/09/2019
Analyzed Date: 07/10/2019
Reported Date: 07/10/2019

Project/Test Address: 2199222
Collection Date:

Client Number:
201676

Fax Number:
330-497-0772

Laboratory Results

Lab Sample Number	Client Sample Number	Collection Location	Pb (ug/g) ppm	% Pb by Wt.	Narrative ID
19-07-01313-001	L-1		4200	0.42	
19-07-01313-002	L-2		780	0.078	

Preparation Method: ASTM E-1979-17
Analysis Method: EPA SW846 7000B
Accreditation #: OH 10028

Reviewed By Authorized Signatory:

Tariq Mohammed
QC Clerk

The HUD lead guidelines for lead paint chips are 0.50% by Weight, 5000 ppm, or 1.0 mg/cm². The Reporting Limit (RL) for samples prepared by ASTM E-1979-17 is 10.0 ug Total Pb. The RL for samples prepared by EPA SW846 3050B is 25.0 ug Total Pb. Paint chip area and results are calculated based on area measurements determined by the client. All internal quality control requirements associated with this batch were met, unless otherwise noted.

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, area, etc., was provided by the client. Results reported above in mg/cm3 are calculated based on area supplied by client. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C.

ELLAP Accredtitation through AIHA-LAP, LLC (100420), NY ELAP #11714.

LEGEND	Pb= lead	ug = microgram	ppm = parts per million
	ug/g = micrograms per gram	Wt. = weight	

EHS Laboratories™

Environmental Hazards Services, LLC

Lead Chain-of-Custody Form

SHIP TO: 7469 Whitepine Rd. Richmond, VA 23237
Phone: (800) 347-4010 FAX: (804) 275-4907
ONLINE CLIENT PORTAL AVAILABLE FOR ANALYSIS RESULTS AT:
www.leadlab.com

19-07-01313

Due Date:
07/10/2019
(Wednesday)
E

EG

2 JP 7/9/19

Company Name: Eurofins EMLab P&K Account Number: 201676

Address: 1501 W Knudsen Dr City/State/Zip: Phoenix AZ 85027

Phone : 623) 298-1014 Email : ahetherington@emlabpk.com Fax:

Project Name / Testing Address: 2199222 Project City/State (Required):

Collected By: Certification Number: P.O. #: Do wipe samples submitted meet ASTM E1792 requirements? ○ Yes ○ No

Sample Type - Key For Grid	Sample Location Abbreviations - Key For Grid	Surface Type for Dust Wipes – Key For Grid
Single Dust Wipe = DW; Air = A; Paint Chip = PC; Soil = S; Composite Soil = CS	FR = Family Room; LR = Living Room; DN = Den; F = Front; R = Rear; LT = Left; 1 = 1stFL; 2 = 2ndFL; RT = Right; BA = Bath; DR = Dining Room; KT = Kitchen; BR = Bedroom; O = Basement	FL = Floor; CP = Carpet; SL = Window Sill; WW = Window Well

TURN AROUND TIMES: IF NO TAT IS SPECIFIED, SAMPLE(S) WILL BE PROCESSED AND CHARGED AS 3 DAY TAT.

● 1 Day ○ 2 Day ○ 3 Day ○ * Same Day – Must Call Ahead ○ * Weekend - Must Call Ahead

No.	Client Sample ID	Collection Date	Collection Time	Sample Type	Collection Location (LR, KT, LTFBR, RTRBR, etc.)	Surface Type	Area: Length X Width in inches (Provide paint chip area only if requesting mg/cm2)	Paint Chip: mg/cm²	Paint Chip: % by weight	Air: Total Time (minutes)	Air: Flow Rate (L/min)	Air: Volume Total (Liters)	Comments
1	L-1		A.M./P.M.	PC			X	X					> PPM / % by weight per Kara 7/9/19
2	L-2		A.M./P.M.	PC			X	X					
3			A.M./P.M.				X						
4			A.M./P.M.				X						
5			A.M./P.M.				X						
6			A.M./P.M.				X						
7			A.M./P.M.				X						
8			A.M./P.M.				X						
9			A.M./P.M.				X						
10			A.M./P.M.				X						

Released by: Kendra Griffith	Signature: K Griffith	Date/Time: 7/5/19	
Received by: D. Emory	Signature: D. Emory	Date/Time: 7/9/19 11:05AM	

Attachment 8

DRAFT

Attachment 3

002199222

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)***

☐ denise.wallen@terracon.com Engineering Assistant	☐ eric.dyer@terracon.com Engineering Assistant			
☐ PM – S. Steiner asteiner@terracon.com	☐ PM – K. Schroeter kmschroeter@terracon.com			
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kattchee tskattchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA REDWOOD CABIN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem Other EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-1	Paint Color: Green Substrate: wood Component: Floor Sample Location: Bldg # cabin Unit # west Room Kit	F
L-2	Paint Color: white Substrate: Glass wood Component: window Sample Location: Bldg # cabin Unit # South Room Ext	F
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	7-3-19
Received By:		**Signature:**		**Date/ Time:**	7/5/19 FedEx 950
Received By:		**Signature:**		**Date/Time:**	

1466 66th Street Emeryville CA 94608 Tel: (510) 547-7771 Fax: (510) 547-1983

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #: JP191014468
Project #: 3042679
Receipt Date: 8-Jul-2019
Analysis Date: 10-Jul-2019
Report Date: 10-Jul-2019

2199099

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-3	Paint Chip	48000	4.8%

Reporting Limit = 50.0 mg/kg N/A = Not Applicable
INS = Insufficient Sample Weight NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

14468 (J3 Internal Use Only)

Attachment J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
		City/State:	North Canton, OH **Zip:** 44720
City/State:	Phoenix, AZ **Zip:** 85027	**PO #:**	3042679 Per S.D./n.t.

Project Information

Project Name: 2199099	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☐	2 Day ☐	3 Day ☑	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ **NIOSH 9002** ○ **OSHA ID-191**	○ **NIOSH 7400** ○ **ASTM D7201** ○ **ISO 8672** ○ **OSHA ID-160**	○ **AHERA** ○ **NIOSH 7402** ○ **ASTM D6281** ○ **ISO 10312** ○ **ISO 13794**	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ **EPA 100.2** Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ **EPA 100.2** Effluent / WW	○ **ASTM D5755** Microvac ○ **ASTM D6480** Wipe ○ **600/J-93/167** Carpet - EPA ○ Bulk Dust Qualitative	○ **ASTM 7521**-TEM (+/-) ○ **ASTM 7521**-TEM (<1%) ○ **CARB 435**-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS

Flame AA	Graphite Furnace AA - LEAD	ICP
☒ Lead in Paint – **SW846 7420/3050B** ○ Lead in Air – **NIOSH 7082** ○ Lead in Wipes – **SW846 7420/3050B** ○ Lead in Soil – **SW846 7420/3050B**	○ Drinking Water – **EPA 200.9** ○ Wastewater – **SW846-7421** ○ Soil/Sludge – **SW846-7421** ○ Air – **NIOSH 7105**	○ Elements in Air – **NIOSH 7300** ○ Wipe/Soil – **SW846-6010B** ○ Effluent – **SW846-6010B** ○ Welding Fume – **NIOSH 7300M** ○ TCLP – **SW846-1311/6010B**

SILICA/PARTICULATES

X-Ray Diffraction / Gravimetric
○ Respirable Crystalline Silica **NIOSH 7500 / OSHA 142** ○ **NIOSH 0500** – Total Particulates ○ **NIOSH 0600** – Respirable Particulates

Total Number of Samples Submitted: 1

Positive Stop: ☐ YES ☐ NO

Signatures

Relinquished By:	[signature]	**Date:** 7/5/19	**Time:**
Received By:	Ruby Gonzalez	**Date:** 7/8/19	**Time:** 9:30
Relinquished By:		**Date:**	**Time:**
Received By:		**Date:**	**Time:**

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

IH CHAIN OF CUSTODY

Project Name/Number 2199099

Page 2 of 2

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-3		

Comments/Special Instructions:

J3 Resources, Inc. ◆ 6110 West 34th Street ◆ Houston, Texas 77092 ◆ tel: 713/290-0221 ◆ fax: 713/290-0248

Attachment 3

002199099

Terracon

E-MAIL REPORT TO: *PROJECT MANAGER (PM)*

☐ denise.wallen@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐ PM – S. Steiner spsteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield mabenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kettchee takettchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis
X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS-LA HONDA WHITE BARN

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem (Other) EnviroLab

TAT ☐ Rush ☐ 24HRS ☐ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-3	Paint Color: White Substrate: Wood Component: Siding Sample Location: Bldg # upper strip under eve Unit # Barn Room ext	P
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	
	Paint Color: Substrate: Component: Sample Location: Bldg # Unit # Room	

Relinquished By: M.HARRINGTON **Signature:** MH **Date/Time:** 7-3-19

Received By: **Signature:** [signature] **Date/ Time:** 7/5/19 FedEx 9:50

Received By: **Signature:** **Date/Time:**

EMLab P&K
A TestAmerica Company

Report for:

Mr. Michael Benefield, PE
Terracon Consultants, Inc. - Emeryville
1466 66th Street
Emeryville, CA 94608

Regarding: Project: R1197192; ZFA Structual Engineers - Beatty House 17820 Alma Bridge Rd
EML ID: 2199075

Approved by:

Joshua T. Cox

Operations Manager
Joshua Cox

Dates of Analysis:
Lead Analysis (sub-contracted): 07-09-2019

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the samples as received.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Attachment 3

J3 Resources, Inc.
3113 Red Bluff Road Pasadena, Texas 77503
Phone: (713) 290-0223 – Fax: (832) 831-5669
j3resources.com

Lead in Paint Performed by Flame AA – USEPA SW846 7420/3050B

Angela Hetherington
EMLab P&K
1501 W Knudsen Dr
Phoenix, AZ 85027

J3 Order #: JP191014467
Project #: 3042648
Receipt Date: 8-Jul-2019
Analysis Date: 9-Jul-2019
Report Date: 9-Jul-2019

2199075

SAMPLE ID	PAINT COLOR	LEAD CONCENTRATION (mg/kg)	LEAD CONCENTRATION (%)
L-4	Paint Chip	1500	0.15%
L-5	Paint Chip	1800	0.18%
L-6	Paint Chip	18000	1.8%
L-7	Paint Chip	12000	1.2%
L-8	Paint Chip	460	0.046%
L-9	Paint Chip	43000	4.3%

Reporting Limit = 50.0 mg/kg   N/A = Not Applicable
INS = Insufficient Sample Weight   NS = Not Submitted

Analyst: Korry Huddleston

Scott Ward, Ph.D. Lab Director

AIHA LAP, LLC
ACCREDITED LABORATORY
INDUSTRIAL HYGIENE ENVIRONMENTAL LEAD
ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
WWW.AIHAACCREDITEDLABS.ORG
LAB # 157714

☐ Open Lab Fee

IH CHAIN OF CUSTODY

14467 (Lab use only)

J3 resources, inc.

Submitter Name:	Shannon Nast	**Bill to:**	Accounts Payable
Company:	EMLab P&K	**Address:**	EMLab P&K LLC
Address:	1501 W. Knudsen Drive		4101 Shuffel Street NW
		City/State:	North Canton, OH **Zip:** 44720
City/State:	Phoenix, AZ **Zip:** 85027	**PO #:**	3042648 Per D.H./n.t.

Project Information

Project Name: 2199075	Project Manager: Angela Hetherington
Project #:	Telephone – Office/Cell 623-298-1056
Reports - Email Address: ahetherington@emlabpk.com	
Invoice - Email Address: ahetherington@emlabpk.com	Notification By: Email: ☒ Verbal: ☐ Text: ☐
Special Instructions:	

Turnaround Times – Please Select One

Emergency* ☐	1 Day ☑	2 Day ☐	3 Day ☐	5 Day ☐

ASBESTOS

PLM - Bulk	PCM - Air	TEM - Air	TEM - Bulk	TEM - Water	TEM - Dust	TEM/PLM Soil/Vermiculite/Ore
EPA 600/R-93/116 ○ Visual Estimation (<1%) ○ 400 Point Count 0.25% ○ 1,000 Point Count 0.1% ○ Gravimetric Reduction ○ Matrix Reduction (+/-) ○ NIOSH 9002 ○ OSHA ID-191	○ NIOSH 7400 ○ ASTM D7201 ○ ISO 8672 ○ OSHA ID-160	○ AHERA ○ NIOSH 7402 ○ ASTM D6281 ○ ISO 10312 ○ ISO 13794	○ Gravimetric Reduction (<1%) ○ Matrix Reduction (+/-) ○ Qualitative (+/-) ○ Drop Mount ○ Filtration	○ EPA 100.2 Drinking Water ○ >10 µm fibers ○ ≥0.5 µm fibers ○ EPA 100.2 Effluent / WW	○ ASTM D5755 Microvac ○ ASTM D6480 Wipe ○ 600/J-93/167 Carpet - EPA ○ Bulk Dust Qualitative	○ ASTM 7521-TEM (+/-) ○ ASTM 7521-TEM (<1%) ○ CARB 435-Modified ○ Soil – PLM Only (+/-) ○ Vermiculite - TEM (+/-) ○ Vermiculite-Cincinnati ○ Erionite ID

METALS / SILICA/PARTICULATES

Flame AA	Graphite Furnace AA - LEAD	ICP	X-Ray Diffraction / Gravimetric
☒ Lead in Paint – SW846 7420/3050B ○ Lead in Air – NIOSH 7082 ○ Lead in Wipes – SW846 7420/3050B ○ Lead in Soil – SW846 7420/3050B	○ Drinking Water – EPA 200.9 ○ Wastewater – SW846-7421 ○ Soil/Sludge – SW846-7421 ○ Air – NIOSH 7105	○ Elements in Air – NIOSH 7300 ○ Wipe/Soil – SW846-6010B ○ Effluent – SW846-6010B ○ Welding Fume – NIOSH 7300M ○ TCLP – SW846-1311/6010B	○ Respirable Crystalline Silica NIOSH 7500 / OSHA 142 ○ NIOSH 0500 – Total Particulates ○ NIOSH 0600 – Respirable Particulates

Total Number of Samples Submitted: 6 **Positive Stop:** ☐ YES ☐ NO

Signatures

Relinquished By:	[signature]	**Date:** 7/5/19	**Time:**
Received By:	Ruby Gonzalez	**Date:** 7/8/19	**Time:** 9:30am
Relinquished By:		**Date:**	**Time:**
Received By:		**Date:**	**Time:**

** Emergency TAT requires prior lab notification. All samples analyzed outside normal business hours are charged at Emergency rate.*
***TAT's are in Business Days rather than Hours (i.e.1 Day TAT = End of Next Business Day)*

DRAFT

Attachment 3

IH CHAIN OF CUSTODY

Project Name/Number 2199075 Page 2 of 2

SAMPLE IDENTIFICATION

SAMPLE NUMBER	SAMPLE LOCATION / MATERIAL	VOLUME
L-4		
L-5		
L-6		
L-7		
L-8		
L-9		

Comments/Special Instructions:

Attachment 3

002199075

Terracon

E-MAIL REPORT TO: PROJECT MANAGER (PM)

☐ denise.walten@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐ PM – S. Steiner spsteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Bonefield mtbonefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kaitchee tzkaitchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) ____ TTLC

PAGE 1 OF 1

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem (Other) EnLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-4	Paint Color: Brown Substrate: wood Component: wall Sample Location: Bldg # ext wall Unit # west Room ____	P
L-5	Paint Color: White Substrate: wood Component: window Sample Location: Bldg # window frame Unit # ____ Room ____	P
L-6	Paint Color: White Substrate: Drywall Component: wall Sample Location: Bldg # ____ Unit # ____ Room Liv Rm	P
L-7	Paint Color: Brown Substrate: wood Component: Door frame Sample Location: Bldg # ____ Unit # ____ Room Liv Kit	P
L-8	Paint Color: White Substrate: wood Component: Kit Sample Location: Bldg # ____ Unit # Door frame Room wall	P

Relinquished By:	M.HARRINGTON	**Signature:**	MH [signature]	**Date/Time:**	7-3-19
Received By:		**Signature:**		**Date/ Time:**	7/5/19 FedEx 950
Received By:		**Signature:**		**Date/Time:**	

002199075

Terracon

****E-MAIL REPORT TO: *PROJECT MANAGER (PM)*****

☐ denise.wallen@terracon.com Engineering Assistant		☐ eric.dyer@terracon.com Engineering Assistant		
☐ PM – S. Steiner spsteiner@terracon.com		☐ PM – K. Schroeter kmschroeter@terracon.com		
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Frieszell wmfrieszell@terracon.com	☐ PM – T. Kaltchee tekaltchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) ____ TTLC

PAGE 2 OF 2

Project Name/ Address/ Building No. ZFA STRUCTURAL ENGINEERS- BEATTY HOUSE 17820 ALMA BRIDGE RD

Project# R1197192 **Sampled By:** M.R & M.H **Sampling Date:** 7-3-19

Sample(s) sent to: ☐ MAL ☐ EMSL ☐ Aerobiology ☐ Quantem **Other** EmLab

TAT ☐ Rush ☐ 24HRS ☒ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (I/F/P)
L-9	Paint Color: white; Substrate: window putty; Component: Glass Wood; Sample Location: Bldg # ___ Unit # ___ Room Ext; 14 windows 4x5 200 LF	F
	Paint Color: ___ Substrate: ___ Component: ___ Sample Location: Bldg # ___ Unit # ___ Room ___	
	Paint Color: ___ Substrate: ___ Component: ___ Sample Location: Bldg # ___ Unit # ___ Room ___	
	Paint Color: ___ Substrate: ___ Component: ___ Sample Location: Bldg # ___ Unit # ___ Room ___	
	Paint Color: ___ Substrate: ___ Component: ___ Sample Location: Bldg # ___ Unit # ___ Room ___	

Relinquished By: M.HARRINGTON	**Signature:** MH	**Date/Time:** 7-3-19
Received By:	**Signature:** [signature]	**Date/ Time:** 7/5/19 FedEx 950
Received By:	**Signature:**	**Date/Time:**

DRAFT

APPENDIX E

LICENSES AND CERTIFICATIONS

State of California
Division of Occupational Safety and Health
Certified Site Surveillance Technician

Michael H Reed
Name

Certification No. **08-4464**

Expires on **12/18/19**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 3

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC HEALTH

LEAD-RELATED CONSTRUCTION CERTIFICATE

INDIVIDUAL:	CERTIFICATE TYPE:	NUMBER:	EXPIRATION DATE:
 Micheal Reed	Lead Sampling Technician	LRC-00000224	5/21/2020

Disclaimer: This document alone should not be relied upon to confirm certification status. Compare the individual's photo and name to another valid form of government issued photo identification. Verify the individual's certification status by searching for Lead-Related Construction Professionals at www.cdph.ca.gov/programs/clppb or calling (800) 597-LEAD.

Attachment 3

State of California
Division of Occupational Safety and Health

Certified Site Surveillance Technician

Michael D Harrington
Name

Certification No. 01-3017

Expires on 12/05/19

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.


State of California Department of Public Health

Lead-Related Construction Certificate

Certificate Type	Expiration Date
Project Monitor	04/26/2020
Sampling Technician	04/26/2020

Michael D. Harrington ID #: 2207

Attachment 3

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Michael S Benefield
Name

Certification No. 06-3938

Expires on 02/15/20

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Attachment 3

APPENDIX F

PHOTOGRAPHS

Photo 1 La Honda Log Cabin

Photo 2 La Honda White Barn

Photo 3 Beatty House

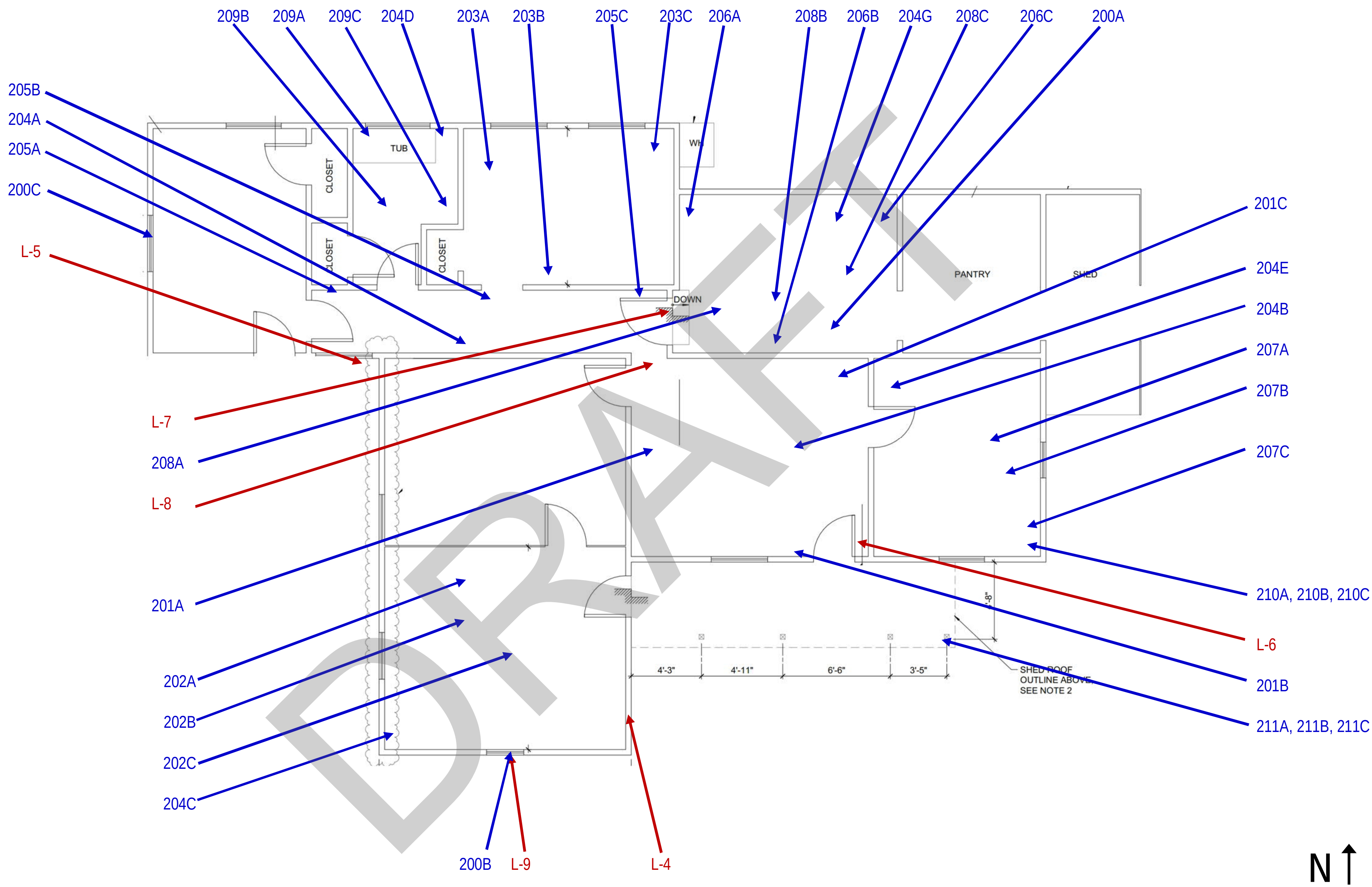
Photo 4 Material 204 - ACM joint Compound on wallboard walls and ceilings in the Beatty House

Photo 5 Material 201 ACM vinyl sheet flooring in the Beatty House

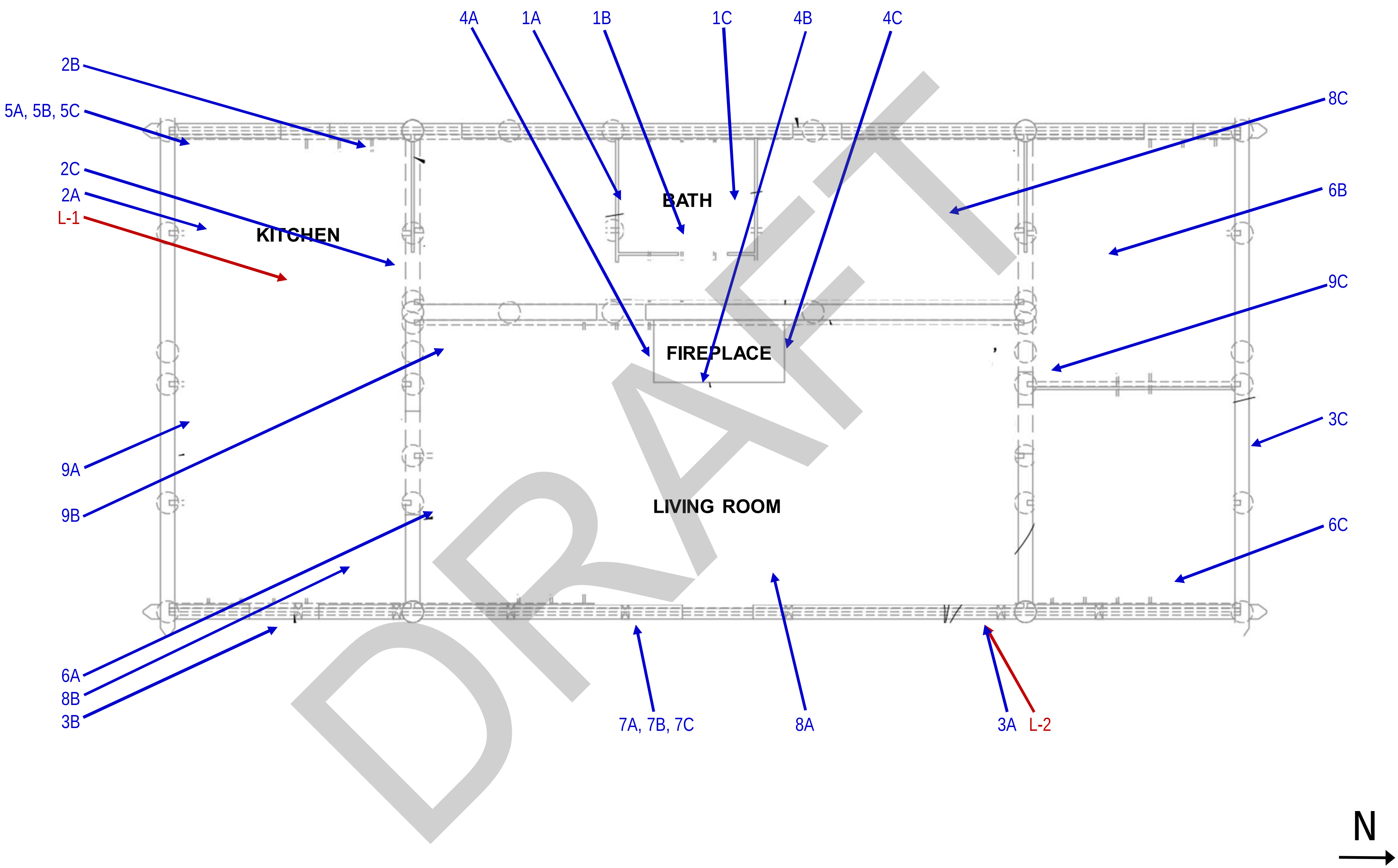
APPENDIX G

SAMPLE LOCATION DRAWINGS

Attachment 3



Terracon	Beatty House La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2



Terracon	Redwood Log Cabin La Honda Creek Open Space Preserve	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 2

Sample L-3 white paint on wood siding collected from exterior of barn

Samples 100A, 100B, and 100C Black 1/8” wiring collected from interior of barn

Terracon	White Barn	17820 Alma Bridge Road Los Gatos, CA	Drafted By: DW	Not to Scale
	SURVEY DATE: July 2, 2019	PROJECT NO.: R1197192	Checked By: MB	FIGURE: 3

EXHIBIT E

Structural Surveys for Special-Status Mammal Species

by Swaim Biological, Incorporated

Swaim Biological, Incorporated
4435 First Street PMB #312
Livermore, CA 94551

TO	Matthew Chaney, Midpeninsula Regional Open Space District 330 Distel Circle Los Altos, Ca 94022
FROM	Karen Swaim and Ryan Byrnes, Swaim Biological Incorporated 4435 First Street Livermore, CA 94551
DATE	June 30, 2019
SUBJECT	La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands and Rancho San Antonio Preserve – Structural Surveys for Special-Status Mammal Species

1. INTRODUCTION AND BACKGROUND

Per Midpeninsula Regional Open Space District's (District) request, Swaim Biological Incorporated (SBI) has conducted habitat and occupancy surveys for special status mammal species at the La Honda Creek Preserve, Sierra Azul Preserve, Purisima Uplands (Guisti Property) and Rancho San Antonio Preserve in June 2019. Surveys evaluated structures and the surrounding areas in preparation for structure stabilization and demolition projects. SBI's qualified biologists surveyed for San Francisco dusky-footed woodrats (*Neotoma fuscipes annectens*) and roosting bats at nine (9) structures, twelve (12) storage tanks and multiple debris piles at six (6) separate locations. This report details the methods and provides a summary of our survey results and recommendations. A follow-up bat emergence survey was conducted at the Sierra Azul Preserve - Beatty Property by District Biologist Matthew Chaney on July 30, 2019.

2. METHODS

Special Status Bat Surveys

Surveys for bats are difficult to standardize because of the large amount of variability that exists at individual survey sites and among survey sites in a project area, much less across the range of a species. Nevertheless, several practices were used to survey for bats, including; bat habitat assessments, daytime maternity roost and signs of bats use surveys (i.e., guano pellets and urine staining), emergence surveys, and acoustic surveys.

SBI biologists conducted a daytime bat survey at each location to determine if the structures, storage tanks, and associated debris piles are currently in use by bats. During the surveys, the biologists inspected habitat

features on the exterior of each structure and searched for bats or signs of bat occupancy including maternity roosts, day roosting bats, guano pellets and urine staining. Coordinates and photographs were taken of each roost identified.

The bat emergence and acoustic surveys began one-half hour before sunset and continued until at least one hour after sunset or until it was otherwise too dark to see emerging bats. Surveyors positioned themselves so that emerging bats would be silhouetted against the sky as they exited the roost. Surveyors were close enough to the roost to observe all exiting bats, but not close enough to influence emergence. Acoustic detectors were deployed in conjunction with emergence survey efforts to monitor bat activity within the proposed project area. Bat vocalization calls were recorded with SonoBatLIVE (using the Petterson M500 USB mic), Anabat Swift, and Pettersson D500 (bat acoustical detectors). Bat vocalization files were analyzed and vetted through SonoBat 4.4 using the SonoVet utility (bat call analysis software) by qualified biologists.

In locations where suitable bat habitat was observed but no bats or signs of bats were observed, absence is not presumed. Bats may switch roosts on a nightly basis and the surveys conducted are not interpreted as presence/absence surveys.

Bat occupancy was determined as a potential maternity colony whenever an aggregate of bats were observed roosting or emerging at a specific structure. Classification as a maternity colony is a conservative/cautious estimate for aggregates of bats and is therefore not discriminating between non-reproductive male or female roosts. A single bat could be a "maternity colony" (i.e. One adult bat with a pup) and even small maternity roosts could represent a large portion of the local bat population and are therefore "significant". Bats (including females with pups) may switch roosts on a nightly basis and therefore might use suitable habitat, if present, though not observed during the surveys. Therefore, we classified and reported aggregates of bats observed as maternity colonies during the summer/maternity season.

San Francisco Dusky-footed Woodrat Surveys

SBI qualified biologists also conducted detailed surveys for woodrats by searching the interior and exterior of all structures, storage tanks (exterior only), and associated debris piles for signs of woodrat occupancy (nests and droppings) within 50-foot of the project area. SBI flagged and photographed any nests that were encountered. Coordinates of each nest was recorded along with a description of the nest.

3. SURVEY RESULTS

Survey results for each survey location are provided below. Site specific recommendations are provided at the end of each location section. Descriptions of recommendations for all sites are compiled at the end of the report.

3.1 LA HONDA CREEK PRESERVE – WHITE BARN (DYER BARN)

SUMMARY

The survey for White Barn on Allen Road, Woodside, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures (Photo 1-2). Three roosting bats were detected during the daytime survey. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn surveyed receives partial shade from the riparian corridor to the west (Photo 3). Surrounding the barn is signs of wetland / wet meadow as demonstrated by the presence of (giant plantago (*Plantago major*), sedges (*Scirpus spp.*), elderberry (*Sambucus nigra spp. Caerulea.*), and willows (*Salix sp*). A concrete drainage adjacent to the east side of the barn appears to drain overland flow into the adjacent drainage (Photo 4). The barn itself is in a flat that leads to a downstream ravine and riparian corridor. The interior of the barn (Photo 5 and 6) is comprised of one area subdivided into sections by feeding stalls, an interior enclosed chicken coop, and an open space area. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 7).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the floor, roof and the walls of the barn. The gaps as well as multiple missing wood slats allow bats to easily enter the building and roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof. Moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat, no other structures or outbuildings were observed in the immediate area to provide additional maternity roost habitat. Suitable bat foraging habitat is found throughout the White Barn survey area.

Bat guano was observed in the interior of the structure on the floor along the north wall (Photo 8). Three *Myotis sp.* (Photo 9 and 10) were observed day roosting in these rafters on the north side of the barn. Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat.

Rodent sign is present throughout the structure with multiple large grass nests (Photo 11) and a significant number of rodent droppings observed (Photo 12). While the biologists were within the chicken coop, they heard a rodent scurrying directly overhead. No woodrat nests were observed on the premises or within the 50-foot buffer. There was a woodrat squeaking repeatedly in the nearby riparian corridor although no middens were observed where the noise was coming from.

DISCUSSION AND RECOMMENDATIONS

Suitable bat roost habitat is present within the structure and moderately suitable maternity roost habitat is found adjacent to the structure in the form of bat tree roost habitat. Based on the observed presence of at least three bats roosting within the structure this site is presumed to be serving as a maternity roost.

No signs of woodrats were present in the structure or surrounding natural habitat. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

Recommendations for the White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- The need for replacement habitat due to impacts on the maternity roost per District guidelines is dependent upon whether the planned stabilization activities will eliminate roosting habitat. Determination of the need for replacement habitat plan should coincide with the development of the deterrent plan.

Photo 1. White Barn exterior.

Photo 2. White Barn exterior.

Photo 3. White Barn exterior missing wooden slats and entry points for bats.

Photo 4. Concrete drainage to the east of White Barn that feeds into the riparian corridor.

Photo 5. Interior of White Barn.

Photo 6. Interior of White Barn.

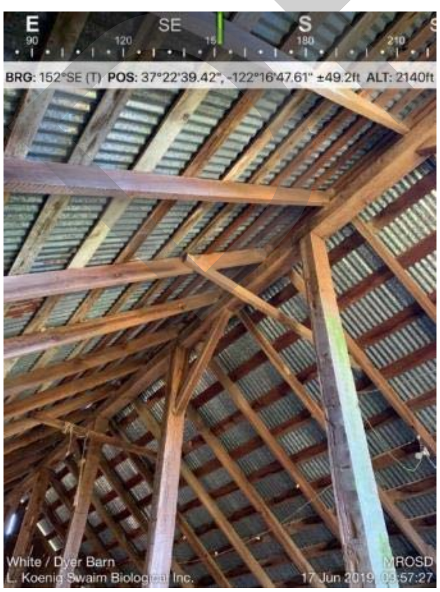


Photo 7. Corrugated roof slats and rafters provide suitable bat roosting habitat.

Photo 8. Bat guano present on the floor.

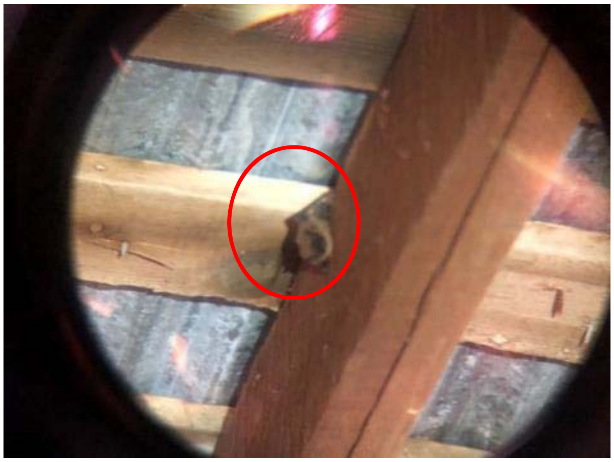


Photo 9. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 10. *Myotis sp.* (circled in red) observed roosting in rafters.

Photo 11. Rodent nests observed within the barn. These grass nests are most likely deer mouse (*Peromyscus sp.)* nests.

Photo 12. Rodent droppings and destroyed food caches observed within the barn.

3.2 LA HONDA CREEK PRESERVE – REDWOOD CABIN

SUMMARY

An external survey for Redwood Cabin on Skyline Boulevard, Redwood City, California was conducted on June 17, 2019 by biologists Ashley Estacio and Leslie Koenig. An internal and emergence survey was completed on June 26, 2019 by biologists Rachael Burnham and Leslie Rivas. No signs of roosting bats were detected during the internal and external survey of existing structures within. Four dusky-footed woodrat nest structures were observed inside the structure. No bats were observed emerging from the Redwood Cabin during the emergence survey. Acoustic recordings identified fringed myotis (*Myotis thysanodes)* foraging calls in the vicinity.

STRUCTURE

The Redwood Cabin is a one-story structure situated in a redwood forest and is well shaded with only dappled light coming through to the cabin and forest floor (Photo 13 and 14). The log cabin has several rooms, including a kitchen and two bathrooms. On the east side, the deck and portion of the house are supported off the ground by pillars and other support structure.

RESULTS

There are several possible entryways that bats and woodrats could enter the house: open/broken window, chimney, and crevices in the floor and roof. The ample space underneath the house had numerous crevices that could be used by roosting bats. There were also many cracks and crevices that could provide bat roosting habitat under the eaves, between the logs, and inside the cabin. However, no roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed during the survey. In general, moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. Bat tree roost crevice and cavity roost habitat can be found through the Redwood Cabin work area.

Signs of woodrats were present throughout the cabin including a large number of fecal pellets in all rooms of the cabin. One woodrat nest structure was built into a cabinet in the kitchen (Photo 15), twigs around and behind the oven, twigs on ceiling beams in between rooms (Photo 16), and two nest structures built on top of sinks in two rooms (possibly connected behind the wall) (Photo 17 – 18).

EMERGENCE RESULTS

The bat emergence survey at the Redwood Cabin was conducted one hour before sunset and continued until one-half hour after sunset. No bats were observed emerging from the structure. The acoustic recording device set up in front of the cabin identified one species of bats: fringed myotis. During the emergence survey, no bats were detected emerging from the cabin.

DISCUSSION AND RECOMMENDATIONS

The cabin provides suitable bat roost habitat outside and within the cabin with multiple entry points. Moderately to highly suitable bat maternity roost habitat surrounds the Redwood Cabin and nearby riparian area. While no bats or signs were observed within or outside the cabin during day surveys and no bats were observed emerging during night surveys, a single bat (fringed myotis) was detected with acoustics within proximity of the cabin. Therefore, there is still potential of bat roosting given the available habitat outside and within the cabin. However, this structure receives little light throughout the day and the building is unlikely to warm up sufficiently enough to support a bat maternity roost.

Signs of woodrats were present throughout the structure, however no natural nests were observed outside of the structure. The riparian habitat near the structure provides moderately to highly suitable habitat and may become occupied by woodrats prior to project work.

Recommendations for the Redwood Cabin include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 13. North side of Redwood cabin.

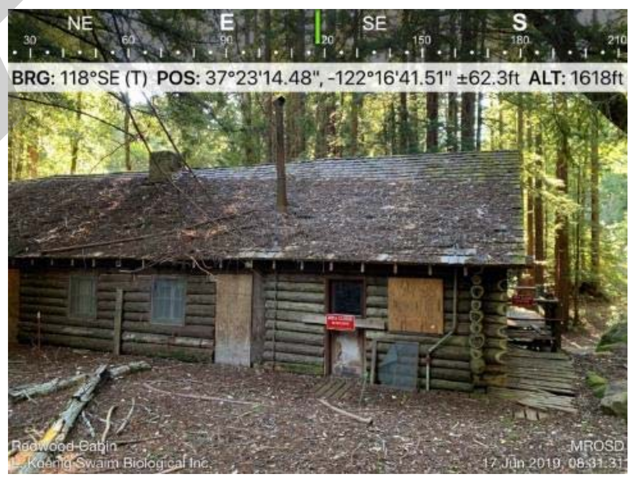


Photo 14. Redwood cabin.

Photo 15. Woodrat nest built into kitchen cabinet of redwood cabin.

Photo 16. Woodrat nest on ceiling beams of redwood cabin.

Photo 17. Woodrat nest on sink in Room A of redwood cabin.

Photo 18. Woodrat nest on sink in a Room B of redwood cabin.

3.3 SIERRA AZUL PRESERVE- MEYER PROPERTY

SUMMARY

An external survey for Meyer Property on Mount Umunhum Road, San Jose, California was conducted on June 11, 2019 by biologists Ben Dudek and Joie de Leon. An internal and emergence survey was completed on June 25, 2019 by biologists Elizabeth Armistead, Ben Dudek, Kathleen Grady, and Leslie Rivas. The biologists conducted a daytime survey at all three structures (labeled A, B, and C) for bat roosts and woodrat nest structures, and a nighttime bat emergence survey. No roosting bats nor signs of bats (i.e., guano pellets and urine staining) were observed inside any of the three structures. One *Myotis Sp.* (Photo 27) was observed in a crevice in a nearby shed on June 11^{th} but not on June 25^{th}. Two dusky-footed woodrat nest structures were observed in oak trees Structure A. Two bats were observed emerging from two exit points during the emergence survey from Structure B. Acoustic recordings identified two species of bats foraging within the vicinity: California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*).

STRUCTURES

Structure A is a two-level house that is set to be demolished (Photo 19 and 20). Structure A is well shaded on the north and west sides of the house by oak trees and is unshaded on the east and south sides of the house. Structure B is the one-level studio apartment that will not be demolished (Photo 25). The structure is mostly unshaded with a flat-topped roof. There is a garage with an open-air shed space attached. Structure C is a shed that will also remain and not be demolished (Photo 26). In general, moderately – highly suitable bat maternity habitat is found adjacent to the structures listed above and within the structures scheduled to remain.

Figure 1. Meyer Property Structures

RESULTS

Structure A: The ceiling of Structure A is accessible to bats through a few entry points under the roof eves and the interior is accessible through the chimney (Photo 21). The interior of the house is comprised of a lower level with six sections (kitchen, dining room, laundry room, living room, bedroom, bathroom, and a crawl space) and an upper level with two sections (hallway and bedroom). No visible sign of bat occupancy was observed inside the house. Some nearby oaks had hollows that could provide moderately to highly suitable bat maternity habitat, including a tree with full sun exposure with 20% exfoliating bark.

Two woodrat nests were located approximately 25-feet from Structure A in the hollowed-out trunks of two large coast live oaks (*Quercus agrifolia*) (Photo 22). A black phoebe (*Sayornis nigricans*) nest was observed under the eve of Structure A.

Structure B: A seam running under the roof eaves of Structure B was observed that could provide suitable bat roosting habitat although no roosting bats or signs of roosting bats were observed (Photo 23). Inside Structure B large quantities of woodrat fecal pellets were observed scattered throughout the shed.

Structure C: The open structure has suitable bat maternity and night roosting habitat within (Photo 24). A potential woodrat midden is located outside of the shed on an upper shelf (Photo 25).

Shed: There is a shed to the west of the structures that were to be surveyed where a day roosting *Myotis* sp. was observed on June 11 (Photo 26). No roosting bats were observed on June 25.

EMERGENCE RESULTS

The bat emergence surveys at Structure A and B were conducted one-half hour before sunset and continued until one and a half hours after sunset. No bats were observed emerging from Structure A. However, bats were observed foraging in the oaks about 25-feet north of Structure A. At Structure B, the biologists observed two bats emerge from two points (Table 1) and fly west towards the coast live oak trees. Acoustic surveys positioned over the open space south of Structure B confirmed the presence of California myotis and big brown bat foraging in the vicinity.

Table 1. Bat Emergence Results at Sierra Azul – Meyer Property (Structure B)

Time	No. of Bats Emerging	Location	Latitude	Longitude
2048	1	Structure B - northwest	37° 10' 2.46" N	121° 52' 9.22" W
2053	1	Structure B - southwest	37° 10' 2.24" N	121° 52' 8.87" W

Table 2. Woodrat nest locations – Meyer Property

Location	Latitude	Longitude	Flagging Color
Oak tree near Structure A	37.1670993	-121.8695911	Pink
Oak tree near Structure A	37.1670114	-121.8696032	Pink
Structure C	37.1670462	-121.8690466	Not flagged

DISCUSSION AND RECOMMENDATIONS

Since these some structures are scheduled for removal and others only stabilization (as described above), we present recommendations for each specific structure. All structures are potentially suitable bat day and night roost habitat. Bats were observed foraging in the in the oaks near these structures which serve as moderately to highly suitable maternity roost habitat nearby.

Structure A: The structure provides potential bat entry points to the structure through ventilation holes in the roof eaves and the chimney. The structure provides suitable roosting habitat under the roof eaves and within the structure if access was obtained through any of the current entry points. While no bats or signs were observed within or outside of the structure during day surveys and no bats were observed emerging from the structure during night surveys, absence cannot be assumed.

Two natural woodrat nests were observed outside of the structure in two large coast live oaks although they are likely outside of the disturbance area for demolition activities.

Recommendations for the Meyer Property Structure A include:

- Preconstruction surveys for bats and woodrats prior to demolition activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities.
- General woodrat avoidance measures presented in Section 4.2.

Structure B: The roof eaves of the structure provide suitable bat roosting habitat. While no bats or signs were observed within or outside of the structure during day surveys, two bats were observed emerging from the structure during the night survey. Based on the observed presence of more than one bat emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed within the structure although no natural nests were observed.

Recommendations for the Meyer Property Structure B include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for any habitat removed or disturbed within all structures at the Meyer Property. No additional replacement habitat is recommended unless required by CDFW.

Structure C: While no bats or signs were observed within the shed during day surveys, though potentially suitable bat day and night roost habitat is present.

Signs of woodrats were present in the structure, however no natural nests were observed outside in the vicinity.

Recommendations for the Meyer Property Structure C include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Develop a bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 19. Structure A is partially shaded by oak trees.

Photo 20. Structure A

Photo 21. Ventilation holes under the eve of Structure A.

Photo 22. Woodrat middens in hollows of oak trees west of Structure A.


Photo 23. Structure B – north-side view.


Photo 24. Structure C – shed west of Structure A.


Photo 25. Possible woodrat midden on shelf in Structure C.


Photo 26. *Myotis sp.* (circled in red) observed roosting in crevice in nearby shed to the west of the structure to be removed.

3.4 SIERRA AZUL PRESERVE – BEATTY PROPERTY

SUMMARY

An external survey for Beatty Property off Alma Bridge Road, Los Gatos, California was conducted on June 19, 2019 by Hailey Pexton and Ben Dudek. An internal and emergence survey was completed on June 28, 2019 by biologists Elizabeth Armistead, Rachael Burnham, and Leslie Rivas. The biologists conducted a daytime survey for bat roosts and woodrat nest structures and a night emergence survey. No bats were observed on the June 19 survey. On June 28 six roosting *Myotis sp.* bats were detected during the daytime survey and eight bats were observed emerging from four exit points during the emergence survey. On July 30, District staff completed follow up emergence surveys and observed 11 bats emerging from the structure. Habitat surrounding the structure is highly suitable for maternity bat roost and foraging habitat. Three dusky-footed woodrat nest structures were observed within 50 feet of the existing structure with large amounts of woodrat sign (e.g., fecal pellets) observed throughout the entire house.

STRUCTURE

The structure is a one-story house with crawl space and is situated in oak woodland with nearby grassland and Lexington Reservoir within 500 feet of the property (Photo 27). There was a total of nine rooms in the house, including a kitchen, laundry room, and bathroom. The house is shaded on the north, east, and south sides and has full sun exposure on the west side.

RESULTS

Biologists fully surveyed around the exterior of the house and found multiple potential bat and woodrat entry and exit points on all sides of the house (Photo 27 and 28). Several large oaks surrounding the structure could support roosting bat habitat; two snags on the west side with 5 – 10% exfoliating bark with full sun exposure, one snag of the east side with 5% exfoliating bark with full sun exposure (Photo 29). The house is in disrepair with many decaying eaves around the roofline that bats could be obtaining access through. There is space between many of the boarded-up windows and doors, and some wooden slats of the house are broken that could also provide bat entry points (Photos 30 – 35). There are various holes and broken wooden slats along the bottom of the house that could provide bat or woodrat entry.

There are large amounts of bat signs (e.g., urine staining and guano) on the walls of the interior of the house and all rooms showed signs of bat use (Photo 36). Six bats (*Myotis* sp.) were observed in various places throughout the house.

Upon entry to the house, large amounts of woodrat sign (e.g., fecal pellets) were observed throughout the entire house (Photo 37 and 38). Lots of debris on the floor of the house and two stick piles observed, one on top of the stove in the kitchen and one on top of the sink in the bathroom (Photos 37 - 42). No substantial woodrat nests were observed inside the structure, but there are numerous woodrat access points to the crawl space and area between ceiling and roof that were not surveyed. Three woodrat nests were observed within the 50 feet of the Beatty house structure (Photos 39 – 41).

EMERGENCE RESULTS

The bat emergence survey was conducted one-half hour before sunset and continued until one half hour after sunset. Eight bats were observed exiting the structure (Table 3) at four locations (Photo 34 and 35).

Table 3. Bat Emergence at Sierra Azul – Beatty Property

Time	No. of Bats Emerging	Location	Latitude	Longitude
2032	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2033	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2038	1	east	37° 11' 26.97" N	121° 59' 8.18" W
2046	1	west	37° 11' 26.91" N	121° 59' 8.55" W
2047	2	west	37° 11' 26.91" N	121° 59' 8.55" W
2048	1	south	37° 11' 26.84" N	121° 59' 8.45" W

Table 4. Woodrat nest locations Beatty Property

Location (see photos 39-41)	Latitude	Longitude	Flagging Color
South of house – woodrat number 1	37.1906508	-121.9856141	Pink
Down hillside from house – woodrat number 2	37.1909208	-121.9857824	Pink
In tree adjacent to house – woodrat number 3	37.1909558	-121.9858746	Pink

DISCUSSION AND RECOMMENDATIONS

The Beatty Property provides highly suitable bat roosting habitat. Based on the observed presence of bat signs throughout the structure, observed bats roosting within, and bats emerging from the structure this site is presumed to be serving as a maternity roost.

Woodrat sign was observed throughout the structure and natural nests observed outside.

Recommendations for the Beatty Property include:

- Preconstruction surveys for bats and woodrats prior to removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Provide replacement bat maternity roost habitat as part of the deterrent plan for approval by CDFW.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 27. Beatty property.

Photo 28. The housing structure is located beneath a canopy of coast live oaks (photo facing west).

Photo 29. Two snags that could support roosting bats on west side of Beatty structure.

Photo 32. Hole on wall that could provide bat access.

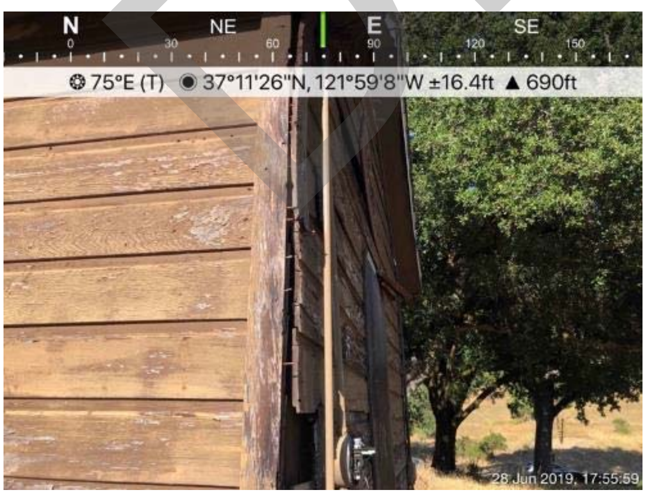


Photo 33. Wooden slats peeling away from the wall.

Photo 34. Bats observed emerging from hole in wall (circled in red) on east side of the house.

Photo 35. Bats observed emerging from wooden slats (circled in red) on west side of the house.

Photo 36. Bat urine staining and guano on wall; *Myotis sp.* (circled in red) observed roosting.

Photo 37. Stick pile on top of stove in kitchen.

Photo 38. Large amount of woodrat feces on floor.

Photo 39. Woodrat nest number 1 is located under an ornamental bush 9 meters south of the structure
.

Photo 40. Woodrat nest number 2 is located along a fence 10 meters northeast of the structure.

Photo 41. Woodrat nest number 3 is located in a tree, northwest of the structure.

Photo 42. Woodrat A large amount of woodrat feces was observed in one location along the exterior of the structure.

3.5 PURISIMA UPLANDS

SUMMARY

A survey for Purisima Uplands in San Mateo County, California was conducted on June 27, 2019 by biologists Victoria Brunal, Rachael Burnham, Ryan Byrnes, and Ben Dudek. The biologists conducted a daytime survey at all locations for bat roosts and woodrat nest structures, and a nighttime bat emergence survey at Areas B and E. No sign of roosting bats was detected during the daytime survey of existing structures. Fourteen dusky-footed woodrat nest structures were observed inside or near existing structures. Three bats were observed emerging from the roofline of the hunting cabin in Area E during the emergence survey. Acoustic recordings at Area E identified these three individual bats as two species: California myotis and Mexican free-tailed bat (*Tadarida brasiliensis*). No bats were observed during the emergence survey at Area B.

RESULTS

AREA A: The structure at Area A is a small, open, un-shaded shed with a corrugated tin roof. No sign of bats (e.g., guano pellets and urine staining) was observed on the inside of the structure. The exposure of the shed, and lack of small crevices inside the structure may make this building sub-optimal for day roosting bats. Dusky-footed woodrat sign (e.g., pellets) were observed inside the shed. Additionally, five woodrat nest structures were observed throughout the site, including a nest underneath Tank 13 and a second nest in a pipe leading away from the tank.

AREA B: The inside of Tanks 1-2 could not be observed due to their height, but both tanks appeared to be single-walled and open on the top. These tanks are likely unsuitable for day roosting bats due to exposure to the elements and the lack of additional surfaces that could create crevices. The distillation column was capped on the top but appeared to have a small opening on its side about 15 feet off the ground that could potentially be used by roosting bats (Photo 43). The structure on the east side of Area B included a series of iron grates over a concrete box filled with water as well as a dilapidated shed with a corrugated tin roof. The shed contained pieces of wood attached to corrugated tin that created small crevices that could be suitable for bats, but no signs of bats were observed. Large woodrat nest structures were observed inside the series of iron gates and inside the dilapidated shed, as well as behind the shed (Photo 44 and 45).

AREA C: Tanks 3-6 appeared sealed and therefore unlikely to support any bat roosting habitat. The roof on Tank 7 is in the process of falling off the structure. Where the ceiling hung over the tank, there was a small area where bats could find shelter, but no sign of bats was observed. One woodrat nest was observed near Tank 3, and another nest was observed near Tank 6.

AREA D: Tanks 8-12, the area around the concrete pylons, and the various debris piles all were searched. The tanks all appeared to be single-walled without any additional surfaces to create crevices suitable for day-roosting bats. Open tops, or open sides in the cases of tanks lying on their sides, created exposure to

the elements that may preclude these structures from being used by bats (Photo 46**)**. A large woodrat nest was observed inside Tank 11, and two smaller satellite nests were observed surrounding the tank.

AREA E: The exterior of the hunting cabin had rotted and loose wood paneling, especially near the roofline, that could be suitable for roosting bats (Photo 47 and 48). A search of the structure's exterior found no sign of bats, however, many holes and crevices that led to the space between the roof and the structure's interior could not be fully observed. A search of the interior of the structure revealed that the previous owners had used the cabin recently. Maternity colony day-roosting habitat was observed inside the structure and no guano pellets or urine staining were observed. Additionally, no sign of woodrats were observed inside the cabin, however small mammals droppings (likely *Peromyscus* sp.) were present throughout the cabin. One large woodrat nest structure was observed behind the cabin.

EMERGENCE RESULTS

The bat emergence surveys at Areas B and E were conducted one-half hour before sunset and continued until one and half hours after sunset. At Area B, the biologists observed the dilapidated building and an opening on the distillation column. No bats were observed emerging from the small opening on the distillation column, or from the dilapidated structure on the east side of Area B. Additionally no bats were observed flying over the habitat. At Area E, the biologist observed the roofline along the front of the hunting cabin. Three bats were observed emerging from the front of the hunting cabin near the roofline. As the bats were seen flying from the cabin, the acoustic recording device set up in front of the cabin identified two species of bats: California myotis and Mexican free-tailed bat. After emergence, bats were observed flying over the habitat and continued to be recorded by the recording device.

Table 5. Woodrat nest locations Purisma Uplands

Location	Latitude	Longitude	Flagging Color
Area A – woodrat nest 1 wooden shed	37.401899	-122.410356	Pink
Area A – woodrat nest 2 near T13	37.401916	-122.410164	Pink
Area A – woodrat nest 3 near T13	37.401961	-122.410085	Pink
Area A – woodrat nest 4 near T13	37.402006	-122.410073	Pink
Area A – woodrat nest 5 near T13	37.402015	-122.409983	Pink
Area D – woodrat nest 6 near T11	37.402713	-122.409107	Pink
Area D – woodrat nest 7 near T11	37.402723	-122.409152	Pink
Area D – woodrat nest 8 near T11	37.402731	-122.409062	Pink
Area C – woodrat nest 9 near T6	37.402968	-122.407817	Pink
Area C – woodrat nest 10 near T3	37.403112	-122.407635	Pink
Area B – woodrat nest 11 near Storage Shed	37.403192	-122.407431	Pink
Area B – woodrat nest 12 near Storage Shed	37.403155	-122.407364	Pink
Area B – woodrat nest 13 near Storage Shed	37.403191	-122.407363	Pink
Hunting Cabin – woodrat nest 14	37.406049	-122.403736	Pink

DISCUSSION AND RECOMMENDATIONS

None of the tanks to be removed provide suitable bat roost habitat. The structure in Area A provides sub-optimal day roosting habitat and the shed in Area B provides suitable bat roosting habitat in the form of crevices although no bats or signs of bats were observed at either structure. No bats or signs of bats were observed during inspections of the interior of the Hunting Cabin in Area E, however, three bats were observed emerging during night surveys. Based on the observation of bats emerging from the Hunting Cabin this site is presumed to be serving as a maternity roost.

Woodrat signs and nests were observed throughout the property in structures, debris piles and natural nests.

Recommendations for the Purisima Property include:

- Preconstruction surveys for bats and woodrats prior to demolition and debris removal activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure demolition activities at the Area E Hunting Cabin.
- Provide replacement bat maternity roost habitat for impacts to removal of maternity roost habitat at Area E Hunting Cabin as part of the deterrent plan for approval by CDFW. This replacement habitat will serve as replacement habitat for all bat roost habitat removed or disturbed during removal activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 43. Area B – the distillation column was sealed on top but appeared to have a small opening on the left-hand side near the valve connection.

Photo 44. Area B – woodrat nest structure inside the series of iron grates. This structure sits over a concrete spring box filled with water.

Photo 45. Area B – woodrat nest structure inside the dilapidated building.

Photo 46. Area D – most tanks were single-walled without any small crevice space for roosting bats.

Photo 47. Area E – additional openings and interstitial spaces underneath the roofline.

Photo 48. Area E – openings underneath the roofline of the hunting cabin.

3.6 RANCHO SAN ANTONIO PRESERVE- DEER HOLLOW FARM WHITE BARN

SUMMARY

The survey for White Barn at Deer Hollow Farm in Cupertino, California was conducted on June 18, 2019 by biologists Ashley Estacio and Leslie Koenig. The biologists conducted a daytime survey at the barn and surrounding area evaluating potential bat roosts and woodrat nest structures. Though the barn provides potentially suitable bat day and night roost habitat, no roosting bats were observed. Signs (bat guano) of bat roosting were observed in the upper level of the barn. In general, highly suitable bat maternity roost habitat and foraging habitat was observed throughout the site in the form of bat tree roosts and man-made structures. No dusky-footed woodrat nest structures were observed inside or near existing structures although signs of rodent activity were observed throughout the barn.

STRUCTURE

The barn that was surveyed is one of many structures in Deer Hollow Farm that is an active educational farm. The lower level of the barn is actively used as a goat milk barn, storage location, and hay barn (Photos 49 and 50). The upper level / former hayloft of the barn is less stable although it too is actively used for storage. The barn receives partial shade from the riparian corridor to the north and a large valley oak to the south. The barn has a pitched roof with corrugated metal sheets held up in regular intervals by rafters (Photo 51 and 52).

RESULTS

The entire structure is accessible to bats and rodents through the gaps between the roof and hayloft doors which are left open. The openings allow for bats to easily enter the building and roost although the openness may reduce the ability for the barn to be used as a maternity roost. These conditions provide suitable bat roosting habitat within the structure including the crevice habitat between the rafters and the corrugated roof.

Bat guano was observed in the interior of the structure on the floor throughout the hayloft (Photo 53). Abundant insect activity was observed in the adjacent riparian area providing suitable bat foraging habitat and the adjacent riparian area has plentiful tree roost habitat available.

Rodent sign is present throughout the structure with rodent droppings observed (Photo 54). No woodrat nests were observed on the premises or within the 50-foot buffer. While no woodrat nests were observed, the riparian habitat near the structure provides suitable habitat and absence of woodrats should not be assumed.

DISCUSSION AND RECOMMENDATIONS

While no day roosting bats were observed during the surveys, signs of bats presence (guano) was observed. The site serves a potentially suitable day and night roosting habitat with adjacent suitable bat foraging and tree roost habitat.

No signs of woodrats were present in the structure or surrounding habitat. The active farm nearby likely limits the potential of woodrats to occur within a construction footprint for the barn, however, the nearby riparian habitat provides suitable habitat and therefore woodrat absence should not be assumed.

Recommendations for the Deer Hollow White Barn include:

- Preconstruction surveys for bats and woodrats prior to stabilization activities.
- Follow the general bat avoidance and minimization measures presented in Section 4.1.
- Development of bat roost deterrent plan for approval by the California Department of Fish and Wildlife (CDFW) prior to structure stabilization activities.
- Follow general woodrat avoidance measures presented in Section 4.2.

Photo 49. White Barn exterior showing hayloft doors and open access points.

Photo 50. White Barn exterior showing hayloft doors and open access points.

Photo 51. White Barn hayloft with crevice roost habitat between roof and rafters.

Photo 52. Interior of hayloft with wooden slat openings

Photo 53. Bat guano on floorboards.

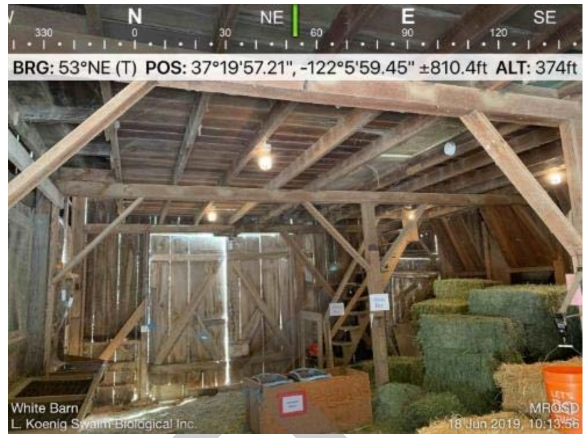


Photo 54. Lower level with hay storage and milk barn

4. RECOMMENDATIONS

Based on the results of these surveys, bats and woodrats are currently using multiple locations within and adjacent to the structures surveyed.

4.1 BATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. At some of these locations suitable bat habitat was observed but no bats were observed during the daytime roost surveys or during emergence. However, bats may switch roosts on a nightly basis, therefore, there is still potential of bats roosting within these structures where suitable habitat is observed. A demolition and deterrent plan for each location that identifies locations for deterrence and what mitigation measures (i.e., replacement habitat) are warranted prior to structure demolition and/or stabilization should be completed as recommended above for each survey location.

The following measures and recommendations for bat deterrence and demolition will be included in the exclusion/deterrent plan. Recommendations should be implemented on a site by site, case by case basis. Not all recommendations are appropriate for all locations, see the Discussion and Recommendations section for each survey location above for reference.

<u>General bat avoidance and minimization measures</u>

- Within two days of the start of work, at all project locations, preconstruction bat roost surveys should be conducted.
- If work is anticipated to occur during the bat wintering period (generally from November 16 through February 15) preconstruction winter roost surveys should be conducted. No building or tree work (over 16" dbh) should be conducted during this time if surveys determine that special status bats or hibernacula are present during winter roost surveys.
- If individual nonbreeding and non-special status bats are present, a qualified biologist may be retained to remove the bats and work may proceed year-round at La Honda Creek Preserve – Redwood Cabin, Sierra Azul Preserve – Meyer Property structures, and the Rancho San Antonio Preserve site. If a maternity roost or special status species bat is observed, no work is allowed without first excluding and providing alternate roost site(s) outside of the breeding season.
- Demolition should be conducted during warmer weather when nighttime lows are not below 50° Fahrenheit, and most bats are likely to be active.
- Recommend that crevices first be demolished with hand tools.
- Initiate demolition in the early evening after sunset with a bat biologist present to capture and temporarily hold any bats that are uncovered.
- If evening work is not feasible, initiate demolition in the early afternoon with a qualified bat biologist present. Early afternoon work will ensure that any remaining roosting bats are not in torpor, as torpid bats may not immediately arouse and escape with disturbance. If any bats are

uncovered, they should be temporarily held and released in the evening.

Bat roost deterrent/exclusion plan

At survey locations with potentially suitable bat roost habitat observed, a site-specific bat roost deterrent plan for is recommended. The following measures below should be considered but may not be applicable to all sites. Alternative roost deterrents may be implemented if approved by qualified biologist. The site-specific deterrent plan shall be submitted to CDFW for approval.

- Deterrents shall be placed outside of April through August maternity season.
- At least seven (7) days before the properties are demolished and/or stabilized, open all windows and doors to increase airflow.
- Deploy ultrasonic acoustic deterrents inside the structures and/or near areas where bats may roost. No acoustic deterrents shall be places next to roosting bats, if bats are observed, deterrents will be placed once bats have left the site.
- Deploy/Install one-way bat doors at locations where bats are observed entering and exiting structures. One-way bat doors and exclusion of bats from the building should occur outside of the April through August maternity season.

Replacement maternity roost habitat

At survey locations with identified maternity roosts, no building demolition or tree work (over 16" dbh) should be conducted April 15 – August 31. Where structures with identified maternity roost habitat will be eliminated, replacement habitat is recommended. CDFW may not require mitigation for these locations, therefore, CDFW should be contacted for guidance for each specific location.

- If CDFW requires replacement habitat, no work should occur without first excluding and providing natural or manmade alternate roost site(s) outside of the breeding season.
- Alternate roost site(s) should be developed by District Natural Resources staff or a consulting biologist and submitted to CDFW before installation.
- Whenever possible alternative roost site(s) should be provided 6 months to 1 year prior to the removal of maternity roosting habitat to allow bats adequate time to discover the new locations.
- Artificial alternative roost site(s) shall be monitored for occupancy by a qualified biologist within one year of installation.

4.2 WOODRATS

The recommendations below should be implemented for each survey location as discussed above in Section 3. A preconstruction survey is warranted at all locations as woodrat houses may become occupied or unoccupied, and new nests constructed prior to project work.

General woodrat avoidance measures

- Conduct focused follow up surveys are at all structures at least five days before construction to confirm the presence of woodrat houses and develop a deterrence/relocation plan if necessary.
- For all woodrat nests that occur in natural habitats (i.e. not within any structure footprint) and cannot be avoided by project activities, a qualified biologist shall live trap to determine if the nest is in use. Trapping activities should occur prior to April and after mid-July each year to prevent impacts to woodrats rearing young or young woodrats. If a nest is found to be unoccupied or not in use for 3 full days (2 nights of trapping), then it may be removed. The nest shall be relocated, or a pile of replacement sticks shall be placed outside of the development footprint for future colonization or re-use.
- In some District locations, woodrats have colonized abandoned buildings, old vehicles, diffuse garbage piles, or other locations where nests are difficult to locate, individuals cannot be live-trapped consistently, and/or there is a lack of woody materials for nest reconstruction. In these instances, live trapping is not required (especially if there is a risk to human health) if the surrounding area provides suitable habitat or supports a healthy colony that is being avoided and/or can be enhanced. Work at these locations must occur prior to April and after mid-July to prevent impacts to woodrats rearing young.
- Once trapped, nests shall be torn down and rebuilt surrounding a log-based structure, an inverted wooden planter, or similar structure having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any cached food and nest material encountered shall be placed within the new structure during rebuilding.
- If individual rats are present, they will be encouraged to leave the area on their own which may include demolition or cleanup in phases, and/or hand removal of materials. If individual woodrats are observed during implementation, work in the immediate area shall cease until the animal leaves the area on its own. Work may continue at other locations away from the observation location. If the animal does not leave the area on its own, the project biologist or a biological monitor shall be notified. Work may proceed at the observation site, once the animal has left the area on its own or a biological monitor is present to ensure that the individual woodrats are not harmed.
- If nests are present that cannot be trapped or removed, woody debris piles that look like woodrat houses can be constructed to provide opportunities for sheltering and colonization by displaced woodrats.
- Relocated nests are expected to eventually be re-colonized and should be monitored one-year post construction using visual surveys and/or wildlife cameras to determine if a relocated nest has returned to use.

EXHIBIT F

Topographic Site Plan

by Sandis

Attachment 3

SANDIS
CIVIL ENGINEERS
SURVEYORS
PLANNERS
1700 Winchester Boulevard, Campbell, CA 95008 | P. 408.636.0900 | F. 408.636.0999 | www.sandis.net
SILICON VALLEY TRI-VALLEY CENTRAL VALLEY SACRAMENTO EAST BAY/SF

DATE:	2019-06-19
SCALE:	1"= 20'
DRAWN BY:	N.M.
APPROVED BY:	K.S.J.
DRAWING NO.:	219122

No.	REVISION/ISSUE	DATE	BY

TOPOGRAPHIC SURVEY

BEATTY PROPERTY
ALMA BRIDGE ROAD
LOS GATOS CALIFORNIA

SHEET 4 OF 4 SHEETS

File: C:\Users\nmigliori\appdata\local\temp\AcPublish_17456\219122 - TOPO.dwg Date: Jul 02, 2019 - 10:55am, nmigliori

EXHIBIT G

Mothballing Guidelines

by ZFA Structural Engineers

ZFA STRUCTURAL ENGINEERS

san francisco
silicon valley
sacramento
santa rosa
napa

Mothballing Guidelines

The focus of mothballing procedures is to stabilize and secure the building:

Stabilization

- Structurally stabilize the building, based on a professional condition assessment.
- Exterminate or control pests, including termites and rodents.
- Protect the exterior from moisture penetration.

Mothballing

- Secure the building and its component features to reduce vandalism or break-ins.
- Provide adequate ventilation to the interior.
- Secure or modify utilities.
- Develop and implement a maintenance and monitoring plan for protection.

Mothballing Checklist

In developing mothballing procedures, the following checklist should be used to ensure that work items are not inadvertently omitted.

Moisture

- Is the roof watertight?
- Do the gutters retain their proper pitch and are they clean?
- Are downspout joints intact?
- Are drains unobstructed?
- Is wood siding in good condition?
- Is site properly graded for water run-off?
- Is vegetation cleared from around the building foundation to avoid trapping moisture?

Pests

- Have nests/pests been removed from the building's interior and eaves?
- Are adequate screens in place to guard against pests?
- Has the building been inspected and treated for termites, carpenter ants, rodents, etc.?
- If toxic droppings from bats, rats and pigeons are present, has a special company been brought in for its disposal?

Housekeeping

- Have the following been removed from the interior: trash, hazardous materials such as inflammable liquids, poisons, and paints and canned goods that could freeze and burst?
- Is the interior broom-clean?
- Have furnishings been removed to a safe location?
- If furnishings are remaining in the building, are they properly protected from dust, pests, ultraviolet light, and other potentially harmful problems?
- Have significant architectural elements that have become detached from the building been labeled and stored in a safe place?
- Is there a building file?

Security

- Have fire and police departments been notified that the building will be mothballed?

- Are smoke and fire detectors in working order?
- Are the exterior doors and windows securely fastened?
- Are plans in place to monitor the building on a regular basis?
- Are the keys to the building in a secure but accessible location?
- Are the grounds being kept from becoming overgrown?

Utilities
- Have utility companies disconnected/shut off or fully inspected water, gas, and electric lines?
- If the building will not remain heated, have water pipes been drained and glycol added?

Ventilation
- Have steps been taken to ensure proper ventilation of the building?
- Have interior doors been left open for ventilation purposes?
- Has the secured building been checked within the last 3 months for interior dampness or excessive humidity?

Maintenance Chart

The following maintenance action items should be considered when developing the maintenance program for the building to be mothballed.

1-3 months; periodic
- Regular drive by surveillance
- Check attic during storms if possible
- Monthly walk arounds
- Check entrances
- Check window coverings for breakage
- Mowing as required
- Check for graffiti or vandalism
- Enter every 3 months to air out
- Check for musty air
- Check for moisture damage
- Check battery packs and monitoring equipment
- Check for evidence of pest intrusion

Every 6 months; spring and fall
- Site clean-up; pruning and trimming
- Gutter and downspout check
- Check crawlspace for pests
- Clean out storm drains

Every 12 months
- Maintenance contract inspections for equipment/utilities
- Check roof for loose or missing shingles
- Termite and pest inspection/treatment
- Exterior materials spot repair and touch up painting
- Remove bird droppings or other stains from exterior
- Maintain building defensible space per Cal Fire standards
- Check and update building file

Reference: Park, Sharon C., 1993. Mothballing Historic Buildings. Preservation Brief No. 31. Department of the Interior, National Park Service. Washington, DC: Government. Printing Office. 15 p. Available online at https://www.nps.gov/tps/how-to-preserve/briefs/31-mothballing.htm

EXHIBIT H

Arborist Report

by Kielty Arborist Services LLC

Kielty Arborist Services LLC
Certified Arborist WE#0476A
P.O. Box 6187
San Mateo, CA 94403
650-515-9783

October 21, 2019

ZFA Structural Engineers
Attn: Mr. Steven Patton
1390 El Camino Real Suite 100
San Carlos, CA 94070

Site: Beatty Property, Los Gatos, CA

Dear Mr. Patton,

As requested on Wednesday, July 24, 2019, I visited the above site to inspect and comment on the trees. Work is proposed on the site, and your concern as to the future health and safety of the trees has prompted this visit. This report will go over the existing health of the trees, and how to protect them from potential construction impacts. Once site plans have been completed, they should be sent to the Project Arborist for further review.

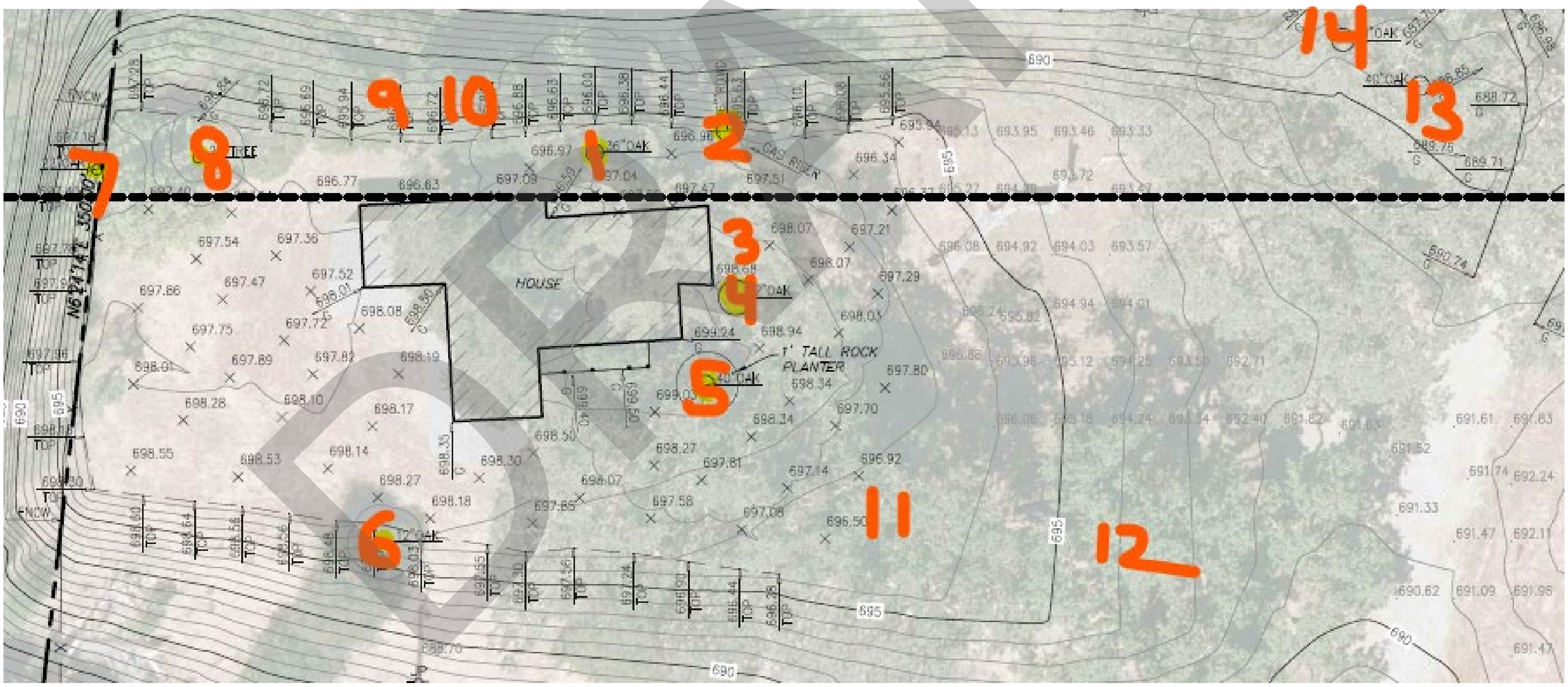
Method:
All inspections were made from the ground; the trees were not climbed for this inspection. The trees in question were located on a topography map provided by you. The trees were then measured for diameter at 54 inches above ground level (DBH or diameter at breast height). Each tree was tagged to indicate the tree number as shown in the survey portion of this report. The trees were given a condition rating for form and vitality. The trees condition rating is based on 50 percent vitality and 50 percent form, using the following scale.

1	-	29	Very Poor
30	-	49	Poor
50	-	69	Fair
70	-	89	Good
90	-	100	Excellent

The height of the trees was measured using a Nikon Forestry 550 Hypsometer where possible. The canopy spreads were paced off. Comments and recommendations for future maintenance are provided.

Beatty 10/21/19 (2)

Tree #	Species	Botanical Name	DBH (inches)	Condition	Ht./Spread	Comments
1	Coast live oak	*Quercus agrifolia*	34.4	65%	50/55	Good vigor, Fair form, Heavy over building
2	Redwood	*Sequoia sempervirens*	20, 15, 12	45%	65/50	Poor to fair vigor, Poor to fair form, Multi leader, Water stressed
3	Coast live oak	*Quercus agrifolia*	17.1	55%	35/40	Fair vigor, Poor form, Leans southeast, decay on leaders
4	Valley oak	*Quercus lobata*	12.6, 20.1	60%	40/40	Fair vigor, Poor to fair form, Codominant @ base, Heavy over building
5	Coast live oak	*Quercus agrifolia*	37.5	65%	40/50	Fair vigor, Poor to fair form, Suppressed, Heavy away from building
6	Coast live oak	*Quercus agrifolia*	12.2	60%	30/25	Good vigor, Fair form, located on edge of bank
7	Coast live oak	*Quercus agrifolia*	10, 15	60%	30/30	Good vigor, Fair form, Codominant
8	Bay laurel	*Umbellularia californica*	20.9	45%	30/25	Good vigor, Poor form, Topped @ 10', Girdled
9	Coast live oak	*Quercus agrifolia*	26 est	50%	45/45	Good vigor, Poor to fair form, Decay on tension side
10	Coast live oak	*Quercus agrifolia*	25 est	55%	40/45	Good vigor, Fair form, Poison oak
11	Valley oak	*Quercus lobata*	32.2, 14	65%	50/45	Good vigor, Fair form, Codominant @ base
12	Valley oak	*Quercus lobata*	40.2	75%	45/55	Good vigor, Good form, Located on drive entrance
13	Valley oak	*Quercus lobata*	38 est	60%	45/55	Good vigor, Fair form, Suppressed by #14, Located by turn in road
14	Valley oak	*Quercus lobata*	45 est	65%	45/60	Good vigor, Fair form, History of limb failure



Showing location of trees on site

Beatty 10/21/19 (3)

Summary:
All of the oak trees on site are in fair to good condition. The oak trees are recommended to be pruned using the crown reduction pruning method, where cuts are made out on the ends of the limbs to reduce limb leverage. This will reduce the risk of a future limb failure where tree leans or decay is present. The oak trees are native to the area. No irrigation shall be applied to the oak trees on site.

(Picture showing oak trees around existing building)

Redwood tree #2 is not native to the area and in poor condition. Redwood trees require significant dry season irrigation to maintain a healthy canopy. No signs of irrigation for the tree were observed. The tree is under drought stress and is in decline due to no supplemental irrigation. Redwood trees should not be placed near oak trees because the needed irrigation for the redwood tree could have a negative impact on the surrounding oak trees. Oak trees that are irrigated during the dry season are susceptible to root rot disease. Root rot is one of the major causes of tree failure in urban conditions where irrigation is near an oak tree. The redwood tree is recommended for removal as it does not fit into the existing landscape.

Laurel tree #8 is the only other tree on site in poor condition. The tree has been topped in the past. A wire is also girdling the tree trunk. Topped trees create hazardous conditions as the new growth is weakly attached. Also, the past topping cut is prone to decay. This tree has a high risk of limb failure. Tree removal is recommended as there is no way to mitigate the high risk of limb failure.

Showing topped bay laurel #8

Beatty 10/21/19 (4)

Dead Monterey pine trees were observed far from the building site (50 feet +). The dead pine trees are a fire hazard to the area and should be removed as soon as possible. Monterey pine trees are not native to this location and likely died due to bark beetles and the prolonged period of drought. The following tree protection plan will help to ensure the future survival of the trees on site.

Showing dead Monterey pine tree

Tree Protection Plan:

Tree Protection Zones

Tree protection zones should be installed and maintained throughout the entire length of the project. Fencing for tree protection zones should be 6' tall, metal chain link material supported by metal 1.5" diameter poles, pounded into the ground to a depth of no less than 2'. The distance between metal support poles shall not be more than 10'. The location for the protective fencing for the trees on site should be placed at the tree driplines where possible. Where it is not possible to place tree protection zones at the dripline because of approved proposed work or existing hardscapes, the tree protection fencing shall be placed at the edge of the proposed work or hardscapes, but not closer than 2 feet from the trunk of any tree. No equipment or materials shall be stored or cleaned inside the protection zones. Areas where tree protection fencing needs to be reduced for access, should be mulched with 6" of coarse wood chips with ½ inch plywood on top (landscape barrier). The plywood boards should be attached together in order to minimize movement. The spreading of chips will help to reduce risk of soil compaction. All tree protection measures must be installed prior to any demolition or construction activity at the site.

Avoid the following conditions:
DO NOT:

- **A.** Allow run off of spillage of damaging materials into the area below any tree canopy.
- **B.** Store materials, stockpile soil, or park or drive vehicles within the TPZ.
- **C.** Cut, break, skin, or bruise roots, branches, or trunks without first obtaining authorization from the Project Arborist.
- **D.** Allow fires under and adjacent to trees.
- **E.** Discharge exhaust into foliage.
- **F.** Secure cable, chain, or rope to trees or shrubs.
- **G.** Trench, dig, or otherwise excavate within the dripline or TPZ of the tree(s) without first obtaining authorization from the Project Arborist.

Landscape Buffer

Where tree protection does not cover the entire root zone of the trees at the dripline, or when a smaller tree protection zone is needed for access, a landscape buffer consisting of wood chips spread to a depth of six inches with plywood or steel plates placed on top will be placed where foot traffic is expected to be heavy. The landscape buffer will help to reduce compaction to the unprotected root zone.

Root Cutting and Grading

Avoid injury to tree roots. When a ditching machine, which is being used outside of the dripline of trees, encounters roots smaller than 2", the wall of the trench adjacent to the trees shall be hand trimmed, making clear, clean cuts through the roots. All damaged, torn and cut roots shall be given a clean cut to remove ragged edges, which promote decay. Trenches shall be filled within 24 hours, but where this is not possible, the side of the trench adjacent to the trees shall be kept shaded with four layers of dampened, untreated burlap, wetted as frequently as necessary to keep the burlap wet. Roots 2" or larger, when encountered, shall be reported immediately to the Project Arborist, who will decide whether the Contractor may cut the root as mentioned above or shall excavate by hand or with compressed air under the root. Root is to be protected with dampened burlap. All roots to be cut shall be monitored and documented. Large roots (over 2" diameter) or large masses of roots to be cut must be inspected by the Project Arborist. The Project Arborist, at this time, may recommend irrigation or fertilization of the root zone. Existing grades underneath the protected tree driplines are to remain as is. If grade changes greater than 4 inches are to take place, special mitigation measures will be needed to reduce impacts to the trees.

Trenching and Excavation (for any reason)

Route pipes outside of the area that is 10 times the diameter of a protected tree to avoid conflict with roots. If this is not possible, trenching for irrigation, drainage, electrical or any other reason shall be done by hand in combination with an air spade when inside the dripline of a protected tree. Hand digging and the careful placement of pipes below or besides protected roots will significantly reduce root loss, thus reducing trauma to the tree. All trenches shall be backfilled with native materials and compacted to near its original level, as soon as possible. Trenches to be left open for a period of time, will require the covering of all exposed roots with burlap and be kept moist. The trenches will also need to be covered with plywood to help protect the exposed roots. When utilities need to be placed within a distance of 3 times the diameter or less of a protected tree on site, the Contractor shall bore beneath the dripline of the tree. The boring shall take place not less than 3' below the surface of the soil in order to avoid encountering "feeder" roots.

Pruning
Any needed or recommended pruning shall be supervised by the Project Arborist, and must be done by a licensed tree care provider. All pruning for trees in fair to good health must stay underneath 25% of the total foliage of the canopy.

Irrigation
Because the trees observed on site that are to be retained are all native trees(oaks), no supplemental irrigation is required. Anytime the trees are to be impacted by minor root cutting, supplemental irrigation should be applied as prescribed by the Project Arborist.

Construction related damage to trees
Any damage due to construction activities shall be reported to the Project Arborist within 24 hours so that remedial action can be taken.

Inspections
It is the contractor's responsibility to contact the site arborist when work is to take place within 10 times the diameter of a tree on site. Kielty Arborist Services can be reached by email at kkarbor0476@yahoo.com or by phone at (650) 515-9783 (Kevin), or (650) 532-4418 (David).

The information included in this report is believed to be true and based on sound arboricultural principles and practices.

Sincerely, Kevin R. Kielty Certified Arborist WE#0476A

Kevin Kielty

Beatty 10/21/19 (7)

Kielty Arborist Services
P.O. Box 6187
San Mateo, CA 94403
650-515-9783

ARBORIST DISCLOSURE STATEMENT

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like a medicine, cannot be guaranteed.

Treatment, pruning, and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, landlord-tenant matters, etc. Arborists cannot take such issues into account unless complete and accurate information is given to the arborist. The person hiring the arborist accepts full responsibility for authorizing the recommended treatment or remedial measures.

Trees can be managed, but they cannot be controlled. To live near a tree is to accept some degree of risk. The only way to eliminate all risks is to eliminate all trees.

Arborist: Kevin Kielty
Kevin R. Kielty

Date: October 21, 2019

EXHIBIT I

Conceptual Cost Estimate

by OCMI

Mid-Peninsula Open Space District
Mid-Peninsula Stabilization

La Honda, CA

ZFA Structural Engineers
CONCEPTUAL COST ESTIMATE,R2
OCMI JOB #: 19414.000
18 December 2019

OC INSIGHT

COST ESTIMATE

INTRODUCTORY NOTES

This estimate is based on verbal direction from the client and the following items, received 30 September 2019:

General	ZFA Structural Engineers BOD Reports dated October 2019. Sketches of 11 July 2019 with BOD option notes per Report. Terracon Hazmat report dated 8-13-19. Kielty Arborist Services LLC Report dated 9-30-19. Page & Turnbull Inc. BOD & Alternative Evaluation dated 9-30-19. ZFA Structural Engineers draft estimate review comments 10-31-19. Comments and clarifications received through 11 December 2019.

The following items are excluded from this estimate:

- Professional fees.
- Building permits and fees.
- Inspections and tests.
- Furniture, fixtures & equipment, except as noted.
- Installation of owner furnished equipment.
- Construction change order contingency.
- Overtime.
- Items referenced as NOT INCLUDED or NIC in estimate.

The midpoint of construction of January 2021 is based on:

- Construction start date of July 2020
- Estimated construction duration of 12 months

- This estimate is based on a Design-Bid-Build delivery method.
- This estimate is based on prevailing wage labor rates.
- This estimate is based on a detailed measurement of quantities. We have made allowances for items that were not clearly defined in the drawings. The client should verify these allowances.
- This estimate is based on a minimum of four competitive bids and a stable bidding market.
- This estimate should be updated if more definitive information becomes available, or if there is any change in scope.
- We strongly advise the client to review this estimate in detail. If any interpretations in this estimate appear to differ from those intended by the design documents, they should be addressed immediately.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

PROJECT SUMMARY

ELEMENT	TOTAL COST	GFA	$/SF AREA
WHITE BARN OPTIONS:			
01. WHITE BARN - OPTION 1	$39,004	1,012	$38.54
01A. OPTION 1 MAINTENANCE COSTS	$144,000		
02. WHITE BARN - OPTION 2	$116,423	1,012	$115.04
02A. OPTION 2 MAINTENANCE COSTS	$288,000		
03. WHITE BARN - OPTION 3	$396,904	1,012	$392.20
03A. OPTION 3 MAINTENANCE COSTS	$288,000		
04. WHITE BARN - OPTION 4	$171,982	1,012	$169.94
REDWOOD CABIN OPTIONS:			
05. REDWOOD LOG CABIN - OPTION 1	$54,250	1,980	$27.40
05A. OPTION 1 MAINTENANCE COSTS	$144,000		
06. REDWOOD LOG CABIN - OPTION 2	$194,501	1,980	$98.23
06A. OPTION 2 MAINTENANCE COSTS	$288,000		
07. REDWOOD LOG CABIN - OPTION 3	$736,793	1,980	$372.12
07A. OPTION 3 MAINTENANCE COSTS	$288,000		
08. REDWOOD LOG CABIN - OPTION 4	$245,869	1,980	$124.18
BEATTY PROPERTY OPTIONS:			
09. BEATTY PROPERTY - OPTION 1	$63,920	1,912	$33.43
09A. OPTION 1 MAINTENANCE COSTS	$144,000		
10. BEATTY PROPERTY - OPTION 2	$208,791	1,912	$109.20
10A. OPTION 2 MAINTENANCE COSTS	$288,000		
11. BEATTY PROPERTY - OPTION 3	$674,313	1,912	$352.67
11A. OPTION 3 MAINTENANCE COSTS	$288,000		
12. BEATTY PROPERTY - OPTION 4	$233,284	1,912	$122.01

1.) The numbers above include mark-ups including escalation to January 2021 at 5% Per Annum. contractor general conditions and insurances.
2.) Design contingency is zero for options 1 and 4. 5% for option 2, and 10% for option 3.
3.) The Owner should add for soft costs and include a separate construction contingency.
4.) Long term maintenance costs have been separated to delineate from capitol costs.

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$34,249	$33.84
NET DIRECT BUILDING COST		$34,249	$33.84
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$3,425	$3.38
SUBTOTAL		$37,674	$37.23
INSURANCE	2.00%	$753	$0.74
SUBTOTAL		$38,427	$37.97
BONDS: CONTRACTOR	1.50%	$576	$0.57
TOTAL BUILDING COST		**$39,004**	**$38.54**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$34,249		$33.84
111 Site Preparation	$6,850		$6.77	
112 Site Improvements	$27,399		$27.07	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$34,249**		**$33.84**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)		NIC		
This design idea was not practical due to location				
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$6,850**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	300	LF	67.42	$20,226
Add for barbed wire outrigger	300	LF	7.42	$2,225
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$27,399**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$25,040	$24.74
04 EXTERIOR CLOSURE		$23,320	$23.04
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$49,002	$48.42
NET DIRECT BUILDING COST		$97,362	$96.21
DESIGN CONTINGENCY	5.00%	$4,868	$4.81
SUBTOTAL		$102,230	$101.02
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$10,223	$10.10
SUBTOTAL		$112,453	$111.12
INSURANCE	2.00%	$2,249	$2.22
SUBTOTAL		$114,702	$113.34
BONDS: CONTRACTOR	1.50%	$1,721	$1.70
TOTAL BUILDING COST		**$116,423**	**$115.04**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$25,040		$24.74
031 Floor and Roof Construction	$25,040		$24.74	
032 Stair Construction				
04 EXTERIOR CLOSURE		$23,320		$23.04
041 Exterior Walls	$23,320		$23.04	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$49,002		$48.42
111 Site Preparation	$49,002		$48.42	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$97,362**		**$96.21**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Add pressure treated blocking and shims at deteriorated wood grade beams to prevent further settlement	120	LF	30.00	$3,600
Structure strengthening at walls				
Wall braces inside exterior wall for lateral strengthening				
Treated timber cross braces, 2x10 each side of post				
Cross braces at Grid 1 & 3, 18' average lengths	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
Cross braces at Grid A & F, 18' long	288	LF	27.50	$7,920
Fix braces T&B to posts	16	EA	175.00	$2,800
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$25,040**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building, limited				
Close off doors, board up with plywood	240	SF	15.00	$3,600
Fill other miscellaneous openings, windows and gaps	1,012	SF	10.00	$10,120
Rehab windows				
Repair window frames	56	LF	50.00	$2,800
Add / replace sills with stop and bead for new pane	56	LF	45.00	$2,520
Clear lexan view panel	86	SF	40.00	$3,440
Paint and seal window frames	56	LF	15.00	$840
TOTAL - 041 EXTERIOR WALLS				**$23,320**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure				
Shoring and support work, Allowance	1,012	SF	10.00	$10,120
Remove / stabilize public safety hazards				
Weed wacking and abatement product to perimeter	140	LF	2.50	$350
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$49,002**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$26,117	$25.81
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$83,050	$82.07
04 EXTERIOR CLOSURE		$26,571	$26.26
05 ROOFING		$32,872	$32.48
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$146,258	$144.52
NET DIRECT BUILDING COST		$314,868	$311.13
DESIGN CONTINGENCY	5.00%	$15,743	$15.56
SUBTOTAL		$330,611	$326.69
ESCALATION TO MIDPOINT 01/2021	5.42%	$17,908	$17.70
SUBTOTAL		$348,520	$344.39
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$34,852	$34.44
SUBTOTAL		$383,371	$378.83
INSURANCE	2.00%	$7,667	$7.58
SUBTOTAL		$391,039	$386.40
BONDS: CONTRACTOR	1.50%	$5,866	$5.80
TOTAL BUILDING COST		**$396,904**	**$392.20**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$26,117		$25.81
011 Standard Foundations	$26,117		$25.81	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$83,050		$82.07
031 Floor and Roof Construction	$83,050		$82.07	
032 Stair Construction				
04 EXTERIOR CLOSURE		$26,571		$26.26
041 Exterior Walls	$26,571		$26.26	
042 Exterior Doors/Windows				
05 ROOFING		$32,872		$32.48
051 Roofing	$32,872		$32.48	
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$146,258		$144.52
111 Site Preparation	$98,758		$97.59	
112 Site Improvements	$47,500		$46.94	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$314,868**		**$311.13**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (130 lf)	14	CY	1,520.72	$21,966
Spread/pad footings under posts, 3'x3'x2.5' deep (4ea)	3	CY	1,245.34	$4,151
TOTAL - 011 STANDARD FOUNDATIONS				**$26,117**
ELEMENT - SUBSTRUCTURE				
021 SLAB ON GRADE				
Slab on grade retrofit work				
Note: Alternate option of slab on grade in lieu of replacing sub floor framing assumed not required		NIC		
TOTAL - 021 SLAB ON GRADE				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor replacement work				
Replace 8x8 bearers, mount on new footings	120	LF	30.00	$3,600
Replace floor joists, 2x10 joists @ 16" o.c	1,012	SF	17.50	$17,710
Replace floor sheathing, 3/4" plywood	1,012	SF	6.40	$6,477
Anchors, joists and bearers into foundations	18	EA	250.00	$4,500
Roofing replacement work				
Replace rafters tails (2x6 Rafters @ 3' o.c, sloped)	243	SF	30.00	$7,286
Install roof sheathing, 1/2" plywood over skip sheathing	1,214	SF	5.40	$6,558
Repair skip sheathing	1,214	SF	2.50	$3,036
Blocking between rafters at perimeter wall	140	LF	27.50	$3,850
Strengthening structure at walls				
Replace 4x4 knee braces to side bays	8	EA	240.00	$1,920
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall sections)	1,048	SF	15.00	$15,720
Plywood sheathing, 1/2"	1,048	SF	4.60	$4,821
Plywood shear nailing	1,048	SF	1.50	$1,572
HDU's, hold downs bolted to sub structure framing	12	EA	150.00	$1,800
Seismic anchors below wall into foundations	12	EA	350.00	$4,200
Alternate option of steel tension rod bracing from roof to foundations not anticipated		NIC		
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$83,050**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall cladding work				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Selective replacement 10% - 20%, old growth wood siding, vertically run	378	SF	17.50	$6,608
Check battens/ sub structure for status and report				
Paint exterior				
Exterior wood cladding (Paint entire building)	1,248	SF	3.23	$4,025
Premium at barn swing doors	2	EA	500.00	$1,000
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Solid heavy duty panel doors on frame with H.D Hinges				
Single, wide swing	2	EA	3,626.93	$7,254
Locks and associated hardware	2	EA	630.00	$1,260
Wood windows, dual glazed	75	SF	70.65	$5,299
Paint window frames	75	SF	15.00	$1,125
TOTAL - 041 EXTERIOR WALLS				**$26,571**
ELEMENT - ROOFING				
051 ROOFING				
Roof replacement				
Skip sheathing to remain				
Plywood sheathing or underlayment board installed over skip sheathing	1,214	SF	3.21	$3,898
Corrugated metal roofing, steel pitch premium	1,214	SF	21.35	$25,922
(saving of $11,960 to project if metall roofing salvaged)				
Flashings and roof plumbing				
Metal cap ridge flashings	40	LF	31.84	$1,273
Metal edge rake coping	62	LF	28.51	$1,779
TOTAL - 051 ROOFING				**$32,872**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Earthwork				
Excavate existing soil under the building, 24" deep				
Excavate, small machine (Temporary demo access)	82	CY	150.00	$12,369
Machine move dirt to outside building	82	CY	75.00	$6,184
Clean out dirt around posts and structure, by hand	1,012	SF	10.00	$10,120
Site off haul				
Load tracks	99	CY	25.00	$2,474
Haul dirt	99	CY	60.00	$5,937
Dispose dirt	99	CY	30.00	$2,969
Sub floor replacement work				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Remove 8x8 bearers, mounted on grade	120	LF	10.00	$1,200
Remove floor joists, piecemeal in existing structure	1,012	SF	5.00	$5,060
Remove floor sheathing, piecemeal in existing structure	1,012	SF	1.75	$1,771
Roofing replacement work				
Remove rafter tails, for replacement	243	SF	10.00	$2,429
Skip sheathing to remain				
Roof replacement				
Remove corrugated metal roofing	1,214	SF	2.40	$2,915
Remove flashings and roof plumbing				
Metal cap ridge flashings	40	LF	6.00	$240
Metal edge rake coping	62	LF	5.00	$310
Exterior wall cladding work				
Remove 10% to 20% old growth wood siding, vertically run	250	SF	5.00	$1,248
Check battens/ sub structure for status and report				
Hazmat demolition				
Remove flaking paint from exterior wall paneling	412	SF	25.00	$10,295
(Assume 33% is flaking and failing)				
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Paint / encapsulation				
Encapsulate and paint the building exterior	1,430	SF	3.60	$5,148
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	10,000.00	$10,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$98,758**

ELEMENT - SITEWORK

112 SITE IMPROVEMENTS

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Page & Turnbull Recommendations:				
Replace doors, windows & locks, ADA, fine grading, planting, pathways				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	27,500.00	$27,500
Planting improvements	1	LS	10,000.00	$10,000
TOTAL - 112 SITE IMPROVEMENTS				**$47,500**

On-going maintenance, 20 year period

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$151,016	$149.23
NET DIRECT BUILDING COST		$151,016	$149.23
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$15,102	$14.92
SUBTOTAL		$166,118	$164.15
INSURANCE	2.00%	$3,322	$3.28
SUBTOTAL		$169,440	$167.43
BONDS: CONTRACTOR	1.50%	$2,542	$2.51
TOTAL BUILDING COST		**$171,982**	**$169.94**

GROSS FLOOR AREA: 1,012 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$151,016		$149.23
111 Site Preparation	$151,016		$149.23	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$151,016**		**$149.23**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,012	SF	2.00	$2,024
Remove metal flashings	130	LF	5.00	$650
Remove exterior siding	1,500	SF	5.00	$7,500
Remove barn doors	3	EA	300.00	$900
Remove roof sheathing	1,012	SF	2.00	$2,024
Demolish wood framed structure	1,012	SF	20.00	$20,240
Demolish flooring	1,012	SF	5.00	$5,060
Demolish sub floor framing	1,012	SF	10.00	$10,120
Remove wood				
Load wood debris in trucks	187	CY	20.00	$3,748
Haul wood in trucks	187	CY	40.00	$7,496
Dispose	187	CY	15.00	$2,811
Hazmat demolition				
Hazmat monitoring and clearance	412	SF	5.00	$2,059
Remove flaking paint from exterior wall paneling (Assume 33% is flaking and failing)	412	SF	25.00	$10,295
Collate/collect and dispose lead paint	412	SF	7.50	$3,089
Testing / hazmat contamination				
Test soil to perimeter of buiding for lead contamination	1	EA	5,000.00	$5,000
Allowance for clean up of contaminated soil	1	EA	15,000.00	$15,000
Biologist monitoring	1	LS	3,000.00	$3,000
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$151,016**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$47,637	$24.06
NET DIRECT BUILDING COST		$47,637	$24.06
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$4,764	$2.41
SUBTOTAL		$52,401	$26.47
INSURANCE	2.00%	$1,048	$0.53
SUBTOTAL		$53,449	$26.99
BONDS: CONTRACTOR	1.50%	$802	$0.40
TOTAL BUILDING COST		**$54,250**	**$27.40**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$47,637		$24.06
111 Site Preparation	$17,245		$8.71	
112 Site Improvements	$30,392		$15.35	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$47,637**		**$24.06**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Approved weed abatement product to perimeter of structure	198	LF	2.50	$495
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$17,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	340	LF	67.42	$22,922
Add for barbed wire outrigger	340	LF	7.42	$2,522
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$30,392**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$42,979	$21.71
04 EXTERIOR CLOSURE		$27,023	$13.65
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$92,655	$46.80
NET DIRECT BUILDING COST		$162,657	$82.15
DESIGN CONTINGENCY	5.00%	$8,133	$4.11
SUBTOTAL		$170,790	$86.26
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$17,079	$8.63
SUBTOTAL		$187,869	$94.88
INSURANCE	2.00%	$3,757	$1.90
SUBTOTAL		$191,626	$96.78
BONDS: CONTRACTOR	1.50%	$2,874	$1.45
TOTAL BUILDING COST		**$194,501**	**$98.23**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$42,979		$21.71
031 Floor and Roof Construction	$42,979		$21.71	
032 Stair Construction				
04 EXTERIOR CLOSURE		$27,023		$13.65
041 Exterior Walls	$27,023		$13.65	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$92,655		$46.80
111 Site Preparation	$87,185		$44.03	
112 Site Improvements				
113 Site Utilities	$5,470		$2.76	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$162,657**		**$82.15**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Foundation support for building				
Cribbing per Corp of Engineers - refer to Site Preparation				
TOTAL - 011 STANDARD FOUNDATIONS				
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	22.00	$4,202
Replace porch framing, East side (Allow 50%)				
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$42,979**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off windows, board up with plywood	285	SF	12.50	$3,563
Close off doors, board up with plywood	84	SF	15.00	$1,260
Close off skylights, bpard up with plywood	240	SF	10.00	$2,400
Fill other miscellaneous openings and gaps	1,980	SF	10.00	$19,800
TOTAL - 041 EXTERIOR WALLS				**$27,023**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Pressure treated wood box cribbing, 6x6 members				
West elevation, 6' high, 2 blocks per lvl, 3' long(24 EA)	7	EA	2,160.00	$15,120
Prepare grade and sub floor for cribbing	7	EA	420.00	$2,940
North elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
South elevation, 6' high, 2 blocks per lvl, 3' long(24EA)	3	EA	2,160.00	$6,480
Prepare grade and sub floor for cribbing	3	EA	420.00	$1,260
East elevation, 8' high, 2 blocks per lvl, 3' long(32 EA)	4	EA	2,880.00	$11,520
Prepare grade and sub floor for cribbing	4	EA	420.00	$1,680
East elevation, 12' high, 2 blocks per lvl, 3' long(48 EA)	1	EA	4,320.00	$4,320
Prepare grade and sub floor for cribbing	1	EA	420.00	$420
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	500.00	$500
Removal and disposal of shrubs	1	LS	250.00	$250
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Large tree removal (3 Tan oaks, 2 Madrones) - 5 Total	5	EA	2,500.00	$12,500
Debris removal, grinding	5	EA	1,500.00	$7,500
Remove girdle from Redwood trees, per Arborist report	2	EA	500.00	$1,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
TOTAL - 111 SITE PREPARATION				**$87,185**

ELEMENT - SITEWORK

113 SITE UTILITIES

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Utility disconnections				
Disconnect plumbing and provide cap/valve	1	LS	2,380.00	$2,380
Disconnect power and safe off	1	LS	2,210.00	$2,210
Remove obsolete power board	1	LS	880.00	$880
On-going maintenance, 20 year period - separated out				
TOTAL - 113 SITE UTILITIES				**$5,470**
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$141,497	$71.46
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$165,195	$83.43
04 EXTERIOR CLOSURE		$36,720	$18.55
05 ROOFING			
06 INTERIOR CONSTRUCTION		$10,280	$5.19
07 CONVEYING			
08 MECHANICAL		$86,770	$43.82
09 ELECTRICAL		$44,150	$22.30
10 EQUIPMENT		$15,381	$7.77
11 SITEWORK		$84,512	$42.68
NET DIRECT BUILDING COST		$584,505	$295.20
DESIGN CONTINGENCY	5.00%	$29,225	$14.76
SUBTOTAL		$613,730	$309.96
ESCALATION TO MIDPOINT 01/2021	5.42%	$33,244	$16.79
SUBTOTAL		$646,974	$326.75
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$64,697	$32.68
SUBTOTAL		$711,671	$359.43
INSURANCE	2.00%	$14,233	$7.19
SUBTOTAL		$725,905	$366.62
BONDS: CONTRACTOR	1.50%	$10,889	$5.50
TOTAL BUILDING COST		**$736,793**	**$372.12**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$141,497		$71.46
011 Standard Foundations	$141,497		$71.46	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$165,195		$83.43
031 Floor and Roof Construction	$165,195		$83.43	
032 Stair Construction				
04 EXTERIOR CLOSURE		$36,720		$18.55
041 Exterior Walls	$36,720		$18.55	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION		$10,280		$5.19
061 Partitions				
062 Interior Finishes	$10,280		$5.19	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$86,770		$43.82
081 Plumbing	$83,470		$42.16	
082 H.V.A.C.	$3,300		$1.67	
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$44,150		$22.30
091 Standard Electrical	$44,150		$22.30	
092 Special Electrical				
10 EQUIPMENT		$15,381		$7.77
101 Fixed/Movable Equipment				
102 Furnishings	$15,381		$7.77	
103 Special Construction				
11 SITEWORK		$84,512		$42.68
111 Site Preparation	$24,512		$12.38	
112 Site Improvements	$35,000		$17.68	
113 Site Utilities	$25,000		$12.63	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$584,505**		**$295.20**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid 1 & 3) Part hand machine dig/ rebar cages	46	CY	1,188.13	$54,707
Foundation tie beams, stepped, 4'wide x 3.5' deep (Grid A,B,C,D) Part hand machine dig/ rebar cages	51	CY	1,188.13	$60,621
Spread/pad footings under posts, 3'x3'x3.5' deep, exterior	14.0	CY	983.81	$13,773
Spread/pad footings under posts, 3'x3'x3.5' deep, interior	12.6	CY	983.81	$12,396
TOTAL - 011 STANDARD FOUNDATIONS				**$141,497**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing repairs				
Trim 12" off base of existing timber posts resting on grade	19	EA	340.00	$6,460
Treat seal base of poles	19	EA	320.00	$6,080
Achor base plates with knife plates connected into footing	19	EA	750.00	$14,250
Anchors connecting poles into new footings	19	EA	450.00	$8,550
Floor leveling				
Systematically level floor to correct settlement				
Hydraulic jack at new pad locations - see item below				
Lift/level floor level, hydraulic jack, difficult terrain (Allow 50% floor area)	990	SF	13.00	$12,870
Sub floor strengthening				
Add sub floor braces at foundation tie beams				
Treated timber cross braces, 4x10 each side of post				
Cross braces at Grid 1 & 3, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Cross braces at Grid A,B,C,D, 12' average lengths	192	LF	35.00	$6,720
Fix braces T&B to posts (Hardware & Connections)	32	EA	195.00	$6,240
Wall/structure strengthening				
Retrofit 8x8 posts, 8' o.c, inside face of exterior walls	30	EA	432.00	$12,960
Fix posts to logs, simpson 0.22"x15" log screws (x2)	30	EA	495.00	$14,850
(Assume 12 logs per post and 24 fixings)				
Anchor posts, T&B (Roof diaphram & bottom to sub floor)	30	EA	425.00	$12,750
Exterior porch				
Replace porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	17.85	$9,978
Bracing and blocking joists	559	SF	5.00	$2,795
Replace porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	17.50	$9,783
Repair/replace porch handrailing				
Replace horizontal log rails, 3 high at perimeter	191	LF	12.00	$2,292
Replace porch framing, East side (Allow 50%)				

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Joists, PTDF 2x6 @ 16" o.c	402	SF	17.85	$7,176
Bracing and blocking joists	402	SF	5.00	$2,010
Replace porch decking, East side (Allow 50%)				
Redwood decking, 2x6 with 1" spacing	402	SF	17.50	$7,035
Floor system inside building, part replacement 10%				
T&G flooring, 1x6 fixed over Diagnol sheathing	198	SF	25.00	$4,950
Diagnol sheathing, 1x6 fixed over framing	198	SF	10.00	$1,980
Floor joists, 4"x5-1/2" @ 24" o.c	198	SF	9.50	$1,881
floor beams/bearers, 2"x5-1/2" over posts	50	LF	12.50	$625
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$165,195**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior wall repairs				
Replace lower 3 rows of logs to perimeter walls, install piecemeal so deconstruct is not required, crafting of new logs to match existing geometries and texture	194	LF	64.00	$12,416
Replace additional 4' at ends of corner logs, staggered laps splicing of new to existing logs	256	LF	67.83	$17,364
Allow to re-secure walls/ stacked logs	194	LF	10.00	$1,940
Allow shoring for the work	1	LS	5,000.00	$5,000
TOTAL - 041 EXTERIOR WALLS				**$36,720**
ELEMENT - INTERIOR CONSTRUCTION				
062 INTERIOR FINISHES				
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660
Refinish existing wood flooring				
Finish wood floor with Tung oil	1,900	SF	3.80	$7,220
TOTAL - 062 INTERIOR FINISHES				**$10,280**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - MECHANICAL				
082 H.V.A.C.				
Kitchen renovation				
Replace kitchen flue	1	LS	1,800.00	$1,800
Stove vent, per city no stove		NIC		
Hot water vent	1	LS	1,500.00	$1,500
TOTAL - 082 H.V.A.C.				**$3,300**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to switchboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,980	SF	12.50	$24,750
Conduit and wiring	1,980	SF	5.00	$9,900
TOTAL - 091 STANDARD ELECTRICAL				**$44,150**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	20	LF	374.23	$7,485
Countertop, plastic laminate with backsplash	20	LF	114.50	$2,290
Wall cabinet, plastic laminate	20	LF	280.30	$5,606
TOTAL - 102 FURNISHINGS				**$15,381**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building demolition				
Electrical demolition				
Remove existing Knob & Tube wiring	1,980	SF	1.40	$2,772
Exterior porch				
Remove porch framing, North, South & West side				
Joists, PTDF 2x6 @ 16" o.c	559	SF	10.00	$5,590
Remove porch decking, North, South & West sides				
Redwood decking, 2x6 with 1" spacing	559	SF	7.50	$4,193
Remove porch handrailing				
Replace horizontal log rails, 3 high at perimeter	107	LF	9.50	$1,017
Exterior wall repairs				
Remove lower 3 rows of logs to perimeter walls (Per level)	194	LF	25.00	$4,850
piecemeal method so deconstruct not required				
Replace additional 4' at ends of corner logs, staggered laps	256	LF	15.00	$3,840
Hazmat demolition				
Remove linoleum floor to Kitchen floor glue product	300	SF	7.50	$2,250
(Prior to renovating the cabin floor)				
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$24,512**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
ADA Improvements, S.W Corner (#10 page 18)				
Site accessibility				
Grading to improve ADA accessibility	1	LS	10,000.00	$10,000
New hardscape pathway, ADA Compliant	1	LS	20,000.00	$20,000
Planting improvements	1	LS	5,000.00	$5,000
TOTAL - 112 SITE IMPROVEMENTS				**$35,000**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / re-run piping for water and sewer to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$215,896	$109.04
NET DIRECT BUILDING COST		$215,896	$109.04
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$21,590	$10.90
SUBTOTAL		$237,486	$119.94
INSURANCE	2.00%	$4,750	$2.40
SUBTOTAL		$242,235	$122.34
BONDS: CONTRACTOR	1.50%	$3,634	$1.84
TOTAL BUILDING COST		**$245,869**	**$124.18**

GROSS FLOOR AREA: 1,980 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$215,896		$109.04
111 Site Preparation	$215,896		$109.04	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$215,896**		**$109.04**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	2,633	SF	2.00	$5,267
Remove doors, single	6	EA	100.00	$600
Remove roof sheathing	2,633	SF	2.00	$5,267
Demolish wood framed structure	1,980	SF	20.00	$39,600
Demolish flooring (Building and Decking)	3,840	SF	2.50	$9,600
Demolish sub floor framing with crawl space (Building and Decking)	3,840	SF	5.00	$19,200
Demolish concrete foundations to building (Minimal)	3,840	SF	2.50	$9,600
Demolish stone and masonry fireplace	720	SF	25.00	$18,000
Demolish concrete foundations to fireplace	1	LS	10,000.00	$10,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Dispose stone and masonry				
Move out of building, hand	27	CY	150.00	$4,000
Load trucks	27	CY	40.00	$1,067
Haul debris	27	CY	50.00	$1,333
Dispose/recycle debris	27	CY	30.00	$800
Dispose concrete (Foundations)				
Load trucks	53	CY	75.00	$3,956
Haul debris	53	CY	50.00	$2,637
Dispose/recycle debris	53	CY	25.00	$1,319
Remove wood				
Load wood debris in trucks	293	CY	15.00	$4,400
Haul wood in trucks	293	CY	30.00	$8,800
Dispose	293	CY	15.00	$4,400
Hazmat demolition				
Hazmat monitoring and clearance	300	SF	5.00	$1,500
Remove linoleum floor to Kitchen floor glue product (Prior to renovating the cabin floor)	300	SF	7.50	$2,250
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	10,000.00	$10,000
TOTAL - 111 SITE PREPARATION				**$215,896**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$56,128	$29.36
NET DIRECT BUILDING COST		$56,128	$29.36
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$5,613	$2.94
SUBTOTAL		$61,741	$32.29
INSURANCE	2.00%	$1,235	$0.65
SUBTOTAL		$62,976	$32.94
BONDS: CONTRACTOR	1.50%	$945	$0.49
TOTAL BUILDING COST		**$63,920**	**$33.43**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$56,128		$29.36
111 Site Preparation	$21,245		$11.11	
112 Site Improvements	$34,883		$18.24	
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$56,128**		**$29.36**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building - Scope eliminated		NIC		
TOTAL - 041 EXTERIOR WALLS				
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Removal and disposal of debris	3	EA	500.00	$1,500
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$21,245**
ELEMENT - SITEWORK				
112 SITE IMPROVEMENTS				
Restrict perimeter access approach				
Perimeter boundary fence				
Chain link, 9 gauge, 8' high (Remote undulating install)	400	LF	67.42	$26,968
Add for barbed wire outrigger	400	LF	7.42	$2,967
Double gates, chainlink, 8' wide	2	EA	1,473.81	$2,948
Signage to property				
Signage at building	2	EA	500.00	$1,000
Signage at entry gates	2	EA	500.00	$1,000
TOTAL - 112 SITE IMPROVEMENTS				**$34,883**

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1/2 day	240	MnDay	600.00	$144,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$3,500	$1.83
04 EXTERIOR CLOSURE		$41,380	$21.64
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$129,728	$67.85
NET DIRECT BUILDING COST		$174,608	$91.32
DESIGN CONTINGENCY	5.00%	$8,730	$4.57
SUBTOTAL		$183,338	$95.89
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$18,334	$9.59
SUBTOTAL		$201,672	$105.48
INSURANCE	2.00%	$4,033	$2.11
SUBTOTAL		$205,706	$107.59
BONDS: CONTRACTOR	1.50%	$3,086	$1.61
TOTAL BUILDING COST		**$208,791**	**$109.20**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$3,500		$1.83
031 Floor and Roof Construction	$3,500		$1.83	
032 Stair Construction				
04 EXTERIOR CLOSURE		$41,380		$21.64
041 Exterior Walls	$41,380		$21.64	
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$129,728		$67.85
111 Site Preparation	$129,728		$67.85	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$174,608**		**$91.32**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Roof repairs				
Repair shed roof along south	1	LS	3,500.00	$3,500
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$3,500**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Mothballing building				
Close off doors, board up with plywood	112	SF	15.00	$1,680
Fill other miscellaneous openings and gaps	1,912	SF	2.50	$4,780
Rehab windows				
Repair window frames	80	LF	50.00	$4,000
Add / replace sills with stop and bead for new pane	80	LF	45.00	$3,600
Clear lexan view panel	258	SF	40.00	$10,320
Paint and seal window frames	80	LF	15.00	$1,200
Strengthening at exterior walls				
Wood bracing, 2x10 with screw fixings				
Interior face exterior wall (10 locations)	300	LF	30.00	$9,000
Fix bracing, screw connections (4 points per location)	10	EA	680.00	$6,800
TOTAL - 041 EXTERIOR WALLS				**$41,380**
ELEMENT - ELECTRICAL				
092 SPECIAL ELECTRICAL				
Security measures (option for self sufficient solar power for electrical panel)				
This design idea was not practical due to location		NIC		
TOTAL - 092 SPECIAL ELECTRICAL				
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Stabilization of structure - support from underneath				
Pressure treated wood box cribbing, 6x6 members				
Exterior, (av) 3' high, 2 blocks per lvl, 3' long(30EA)	25	EA	1,080.00	$27,000
Prepare grade and sub floor for cribbing	25	EA	420.00	$10,500
Interior, (av) 3' high, 2 blocks per lvl, 3' long(20EA)	20	EA	1,080.00	$21,600
Prepare grade and sub floor for cribbing	20	EA	420.00	$8,400
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Hazmat demolition				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Hazmat monitoring and clearance	1	LS	5,000.00	$5,000
Remove wallboard for bracing walls, Hazmat	1,000	SF	4.50	$4,500
Collate and dispose material	1,000	SF	1.50	$1,500
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Paint / encapsulation				
Encapsulate and paint the building exterior to match doors	2,256	SF	3.60	$8,122
Remove / stabilize public safety hazards				
Allow shrub removal along west side	1	LS	2,000.00	$2,000
Removal and disposal of shrubs	1	LS	750.00	$750
Weed wacking and abatement product to perimeter	198	LF	2.50	$495
Remove trees	2	EA	2,000.00	$4,000
Trim large trees hanging over property	3	EA	2,000.00	$6,000
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$129,728**

Maintenance costs:

On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS		$53,644	$28.06
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE		$115,711	$60.52
04 EXTERIOR CLOSURE		$78,956	$41.29
05 ROOFING		$24,238	$12.68
06 INTERIOR CONSTRUCTION		$3,060	$1.60
07 CONVEYING			
08 MECHANICAL		$83,470	$43.66
09 ELECTRICAL		$42,960	$22.47
10 EQUIPMENT		$7,690	$4.02
11 SITEWORK		$125,210	$65.49
NET DIRECT BUILDING COST		$534,939	$279.78
DESIGN CONTINGENCY	5.00%	$26,747	$13.99
SUBTOTAL		$561,686	$293.77
ESCALATION TO MIDPOINT 01/2021	5.42%	$30,425	$15.91
SUBTOTAL		$592,111	$309.68
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$59,211	$30.97
SUBTOTAL		$651,322	$340.65
INSURANCE	2.00%	$13,026	$6.81
SUBTOTAL		$664,348	$347.46
BONDS: CONTRACTOR	1.50%	$9,965	$5.21
TOTAL BUILDING COST		**$674,313**	**$352.67**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS		$53,644		$28.06
011 Standard Foundations	$53,644		$28.06	
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE		$115,711		$60.52
031 Floor and Roof Construction	$115,711		$60.52	
032 Stair Construction				
04 EXTERIOR CLOSURE		$78,956		$41.29
041 Exterior Walls	$78,956		$41.29	
042 Exterior Doors/Windows				
05 ROOFING		$24,238		$12.68
051 Roofing	$24,238		$12.68	
06 INTERIOR CONSTRUCTION		$3,060		$1.60
061 Partitions				
062 Interior Finishes	$3,060		$1.60	
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL		$83,470		$43.66
081 Plumbing	$83,470		$43.66	
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL		$42,960		$22.47
091 Standard Electrical	$42,960		$22.47	
092 Special Electrical				
10 EQUIPMENT		$7,690		$4.02
101 Fixed/Movable Equipment				
102 Furnishings	$7,690		$4.02	
103 Special Construction				
11 SITEWORK		$125,210		$65.49
111 Site Preparation	$100,210		$52.41	
112 Site Improvements				
113 Site Utilities	$25,000		$13.08	
114 Off-Site Work				
NET DIRECT BUILDING COST		**$534,939**		**$279.78**

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - FOUNDATIONS				
011 STANDARD FOUNDATIONS				
Seismic retrofit work (Stabilization of building)				
Perimeter footing, 1.5' wide x 2' deep, hit and miss (184 LF)	20	CY	1,729.72	$35,363
Interior footing, 1.5' wide x 2' deep, hit and miss (40 LF)	4	CY	1,729.72	$7,688
Spread/pad footings under posts, 2'x2'x2.5' deep (20 EA)	7	CY	1,430.02	$10,593
TOTAL - 011 STANDARD FOUNDATIONS				**$53,644**
ELEMENT - SUPERSTRUCTURE				
031 FLOOR AND ROOF CONSTRUCTION				
Sub floor framing				
Replace crawl space posts, 4x4x N.E 4' high	20	EA	400.00	$8,000
Exterior cripple wall - see Exterior walls				
Flooring				
Replace missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	22.50	$1,125
Steel frame clips to connect joists, girders and posts	20	EA	75.00	$1,500
Retrofit sister 2x8 joists ea side girders (double) @48" o.c	1,008	LF	25.00	$25,188
Premium to pre drill and screw sister joists (or bolt)	1,008	LF	7.50	$7,556
Exterior cripple wall - see Exterior walls				
Strengthening structure at walls				
Shear wall retrofit work				
Stud framing, 2x4 @16" o.c (Shear wall) Allow 100LF	800	SF	15.00	$12,000
Plywood sheathing, 1/2"	800	SF	4.60	$3,680
Plywood shear nailing	800	SF	1.50	$1,200
HDU's, hold downs bolted to sub structure framing	20	EA	150.00	$3,000
Seismic anchors below wall into foundations	20	EA	350.00	$7,000
Roof framing				
Retrofit x2 Ridge beams, span between rafters	117	LF	50.00	$5,850
Connect hardware ends of ridge beams	59	EA	115.00	$6,785
Blocking between rafters, exterior perimeter walls	236	LF	17.50	$4,130
Blocking between rafters, interior walls	153	LF	17.50	$2,678
Retrofit collar ties to supplement existing	59	EA	77.50	$4,534
Roofing replacement work				
Replace part rafters, 2x8 Rafters@ 2'o.c (Allowance, 20%)	402	SF	29.50	$11,847
New roof sheathing, 5/8", pitched roof	2,008	SF	4.80	$9,638
TOTAL - 031 FLOOR AND ROOF CONSTRUCTION				**$115,711**
ELEMENT - EXTERIOR CLOSURE				
041 EXTERIOR WALLS				
Exterior walls				
Cripple wall retrofit work				
Stud framing, 2x4 @16" o.c (Cripple wall)	582	SF	15.00	$8,730

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Plywood sheathing, 1/2"	582	SF	4.60	$2,677
Sill/ bearer, 3x4 bolted to foundations, 24" o.c	200	LF	62.50	$12,500
New wood siding, 1x12 to match historical planks, cripple wall				
North elevation, N.E 3.5' high	224	SF	22.50	$5,040
East & West Elevation, N.E 2.5' high	230	SF	22.50	$5,175
South Elevation, N.E 2' high	128	SF	22.50	$2,880
HDU's, hold downs bolted to bearer, 4' o.c	50	EA	125.00	$6,250
Exterior wall cladding work				
Replace siding,1x12 salvaged old-growth redwood, Allowance	150	SF	35.00	$5,250
Check battens/ sub structure for status and report				
Rehab windows				
Repair window frames	138	LF	50.00	$6,900
Add / replace sills with stop and bead for new pane	138	LF	45.00	$6,210
Replace glass to windows	146	SF	30.00	$4,380
Paint and seal window frames	138	LF	15.00	$2,070
Rehab doors, restore to working condition with repair and paint				
Exterior	4	EA	750.00	$3,000
Interior, rooms	4	EA	400.00	$1,600
Interior, cupboards	2	EA	250.00	$500
Paint exterior				
Exterior wood cladding, prepare and paint	2,448	SF	2.37	$5,794
TOTAL - 041 EXTERIOR WALLS				**$78,956**

ELEMENT - ROOFING

051 ROOFING

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Roof Replacement				
Asphalt shingles (standard strip shingles)	1,912	SF	4.87	$9,317
Adhered membrane	1,912	SF	1.72	$3,282
Rigid insulation, 2"	1,912	SF	2.77	$5,295
Flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	6.39	$747
Asphalt shingle valley flashing	25	LF	5.88	$147
Metal eave edge flashing	147	LF	23.47	$3,450
Raked metal roof end flashing	85	LF	23.47	$2,000
TOTAL - 051 ROOFING				**$24,238**

ELEMENT - INTERIOR CONSTRUCTION

062 INTERIOR FINISHES

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Bathroom renovation				
New flooring	80	SF	30.00	$2,400
Floor base	33	LF	20.00	$660

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 062 INTERIOR FINISHES				**$3,060**
ELEMENT - MECHANICAL				
081 PLUMBING				
Building Renovation/upgrades				
Equipment				
HWU	1	EA	3,250.00	$3,250
Instahot at Kitchen sink	1	EA	1,265.00	$1,265
Oven - Not required per City		NIC		
Stove - Not required per City		NIC		
Septic & potable water systems, Allowance	1	EA	60,000.00	$60,000
Fixtures				
WC with cistern	1	EA	775.00	$775
Lavatory with faucet	1	EA	640.00	$640
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	825.00	$825
Rough at fixtures				
WC	1	EA	420.00	$420
Lavatory	1	EA	750.00	$750
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	775.00	$775
Rough plumbing				
WC	1	EA	3,200.00	$3,200
Lavatory	1	EA	2,800.00	$2,800
Bath/shower - Replacement not required per City		NIC		
Stainless steel sink, double	1	EA	3,200.00	$3,200
Seismic bracing	6	EA	300.00	$1,800
Seal penetrations	6	EA	120.00	$720
Test and chlorinate water outlets	2	EA	275.00	$550
Filtration and potability tests	1	LS	2,500.00	$2,500
TOTAL - 081 PLUMBING				**$83,470**
ELEMENT - ELECTRICAL				
091 STANDARD ELECTRICAL				
Upgrade/ Renovation work				
Upgrade/ replace switchboard	1	EA	4,500.00	$4,500
Replace feeders to swicthboard	1	LS	3,500.00	$3,500
Equipment connections	1	LS	1,500.00	$1,500
Light fixtures (Budget Allowance, as no design)	1,912	SF	12.50	$23,900
Conduit and wiring	1,912	SF	5.00	$9,560

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
TOTAL - 091 STANDARD ELECTRICAL				**$42,960**
ELEMENT - EQUIPMENT				
102 FURNISHINGS				
Kitchen renovation				
Base cabinet, plastic laminate	10	LF	374.23	$3,742
Countertop, plastic laminate with backsplash	10	LF	114.50	$1,145
Wall cabinet, plastic laminate	10	LF	280.30	$2,803
TOTAL - 102 FURNISHINGS				**$7,690**
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Demolition, piecemeal at building				
Remove roof shingles	1,912	SF	2.60	$4,971
Remove roof underlayment	1,912	SF	1.20	$2,294
Remove wood siding to replace, Allowance 150 sf	150	SF	5.00	$750
Remove flashings and roof plumbing				
Asphalt shingle ridge cap flashing	117	LF	4.00	$468
Asphalt shingle valley flashing	25	LF	4.00	$100
Metal eave edge flashing	147	LF	6.00	$882
Raked metal roof end flashing	85	LF	6.50	$554
Sub floor framing repairs				
Remove crawl space posts, N.E 4' high	20	EA	390.00	$7,800
Remove sub floor exterior wall paneling	582	SF	12.50	$7,275
Flooring				
Remove missing/ damaged 1x6 floor planks (Provisional 50 sf)	50	SF	10.00	$500
Building demolition				
Remove dilapidated shed	84	SF	22.50	$1,890
Roofing replacement work				
Remove damaged rafters, 2x8 Rafters @ 2' o.c, sloped (Allowance,	402	SF	12.50	$5,020
Remove roof sheathing, 5/8", pitched roof	2,008	SF	2.40	$4,819
Wildlife management				
Removal of unwanted wildlife	1	LS	2,500.00	$2,500
Treatment of insect infestations	1	LS	4,000.00	$4,000
Replacement maternity roost	1	EA	1,500.00	$1,500
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Hazmat monioring and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720

CONCEPTUAL COST ESTIMATE,R2

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	1.50	$5,550
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
On-going maintenance, 20 year period - separated out				
TOTAL - 111 SITE PREPARATION				**$100,210**
ELEMENT - SITEWORK				
113 SITE UTILITIES				
Reconnections, Allowances only				
Reconnect electrical service to building	1	LS	10,000.00	$10,000
Reconnect / correct piping into site to building	1	LS	15,000.00	$15,000
TOTAL - 113 SITE UTILITIES				**$25,000**
Maintenance costs:				
On-going maintenance, 20 year period				
Monthly visit to maintain, 2 men x 1 day	480	MnDay	600.00	$288,000
Exterior site, trees and shrubs				
Check exterior and interior and clean, fix as needed				

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

BUILDING SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
01 FOUNDATIONS			
02 SUBSTRUCTURE			
03 SUPERSTRUCTURE			
04 EXTERIOR CLOSURE			
05 ROOFING			
06 INTERIOR CONSTRUCTION			
07 CONVEYING			
08 MECHANICAL			
09 ELECTRICAL			
10 EQUIPMENT			
11 SITEWORK		$204,845	$107.14
NET DIRECT BUILDING COST		$204,845	$107.14
GENERAL CONDITIONS, OVERHEAD & PROFIT	10.00%	$20,485	$10.71
SUBTOTAL		$225,330	$117.85
INSURANCE	2.00%	$4,507	$2.36
SUBTOTAL		$229,836	$120.21
BONDS: CONTRACTOR	1.50%	$3,448	$1.80
TOTAL BUILDING COST		**$233,284**	**$122.01**

GROSS FLOOR AREA: 1,912 SF

CONCEPTUAL COST ESTIMATE,R2

OCMI JOB #: 19414.000 | 18 December 2019

DETAILED BUILDING SUMMARY

ELEMENT	AMOUNT	TOTAL COST	$/SF AREA	TOTAL $/SF AREA
01 FOUNDATIONS				
011 Standard Foundations				
012 Special Foundations				
02 SUBSTRUCTURE				
021 Slab On Grade				
022 Basement Excavation				
023 Basement Walls				
03 SUPERSTRUCTURE				
031 Floor and Roof Construction				
032 Stair Construction				
04 EXTERIOR CLOSURE				
041 Exterior Walls				
042 Exterior Doors/Windows				
05 ROOFING				
051 Roofing				
06 INTERIOR CONSTRUCTION				
061 Partitions				
062 Interior Finishes				
063 Specialties				
064 Interior Doors/Windows				
07 CONVEYING				
071 Elevators				
08 MECHANICAL				
081 Plumbing				
082 H.V.A.C.				
083 Fire Protection				
084 Special Mechanical				
09 ELECTRICAL				
091 Standard Electrical				
092 Special Electrical				
10 EQUIPMENT				
101 Fixed/Movable Equipment				
102 Furnishings				
103 Special Construction				
11 SITEWORK		$204,845		$107.14
111 Site Preparation	$204,845		$107.14	
112 Site Improvements				
113 Site Utilities				
114 Off-Site Work				
NET DIRECT BUILDING COST		**$204,845**		**$107.14**

CONCEPTUAL COST ESTIMATE,R2

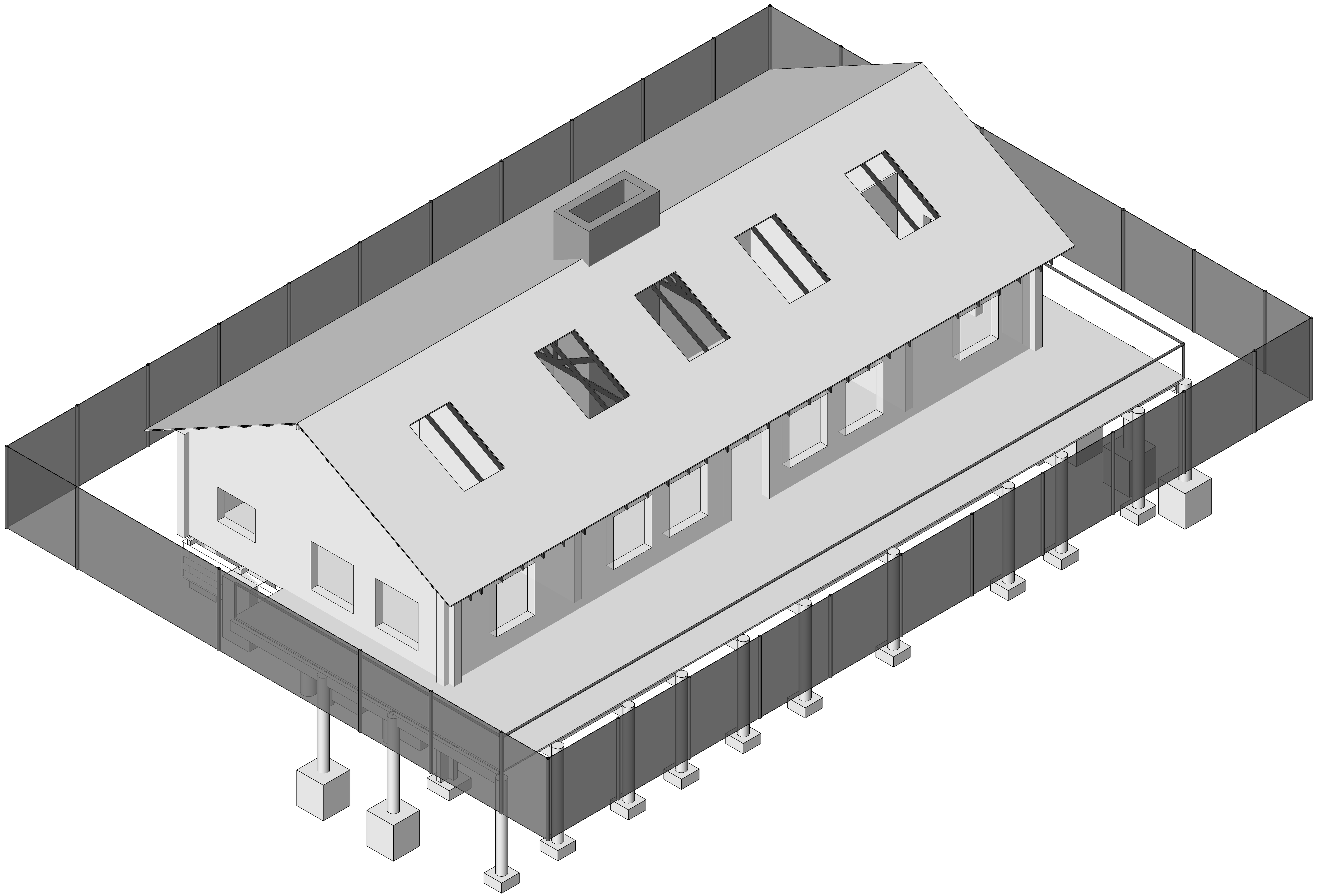
OCMI JOB #: 19414.000 | 18 December 2019

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
ELEMENT - SITEWORK				
111 SITE PREPARATION				
Building/structure demolition				
Remove roofing	1,912	SF	2.00	$3,824
Remove metal flashings	232	LF	5.00	$1,160
Remove exterior siding	2,472	SF	5.00	$12,360
Remove doors, single	12	EA	100.00	$1,200
Remove roof sheathing	1,912	SF	2.00	$3,824
Demolish wood framed structure	1,912	SF	15.00	$28,680
Demolish flooring	1,912	SF	2.00	$3,824
Demolish sub floor framing	1,912	SF	3.50	$6,692
Remove dead tree	2	EA	2,000.00	$4,000
Remove large trees hanging over property	2	EA	2,000.00	$4,000
Recycle wood				
Load wood debris in trucks	212	CY	25.00	$5,311
Haul wood in trucks	212	CY	50.00	$10,622
Dispose/recycle wood	212	CY	35.00	$7,436
Hazmat demolition				
Set up - contain building	1	LS	2,560.00	$2,560
Consultant monitoring, inspections and clearance	2	DYS	2,400.00	$4,800
ACM vinyl flooring with ACM mastic	360	SF	8.71	$3,136
Dispose vinyl product	360	SF	2.00	$720
Wallboard with joint compound	3,700	SF	4.50	$16,650
Dispose wallboard product with ACM joint compound	3,700	SF	0.75	$2,775
Hazmat demolition, remove flaking paint				
Window frames	258	SF	17.50	$4,515
Door and frame, interior	590	SF	15.00	$8,850
Door and frame, exterior	309	SF	15.00	$4,635
Collect and dispose lead paint waste	1,157	SF	3.00	$3,471
Biologist monitoring	1	LS	4,800.00	$4,800
Environmental impact report				
Report to cover CEQA requirements for demolition option	1	EA	40,000.00	$40,000
Site restoration, allowance	1	LS	15,000.00	$15,000
TOTAL - 111 SITE PREPARATION				**$204,845**

Attachment 4

OPTION 1

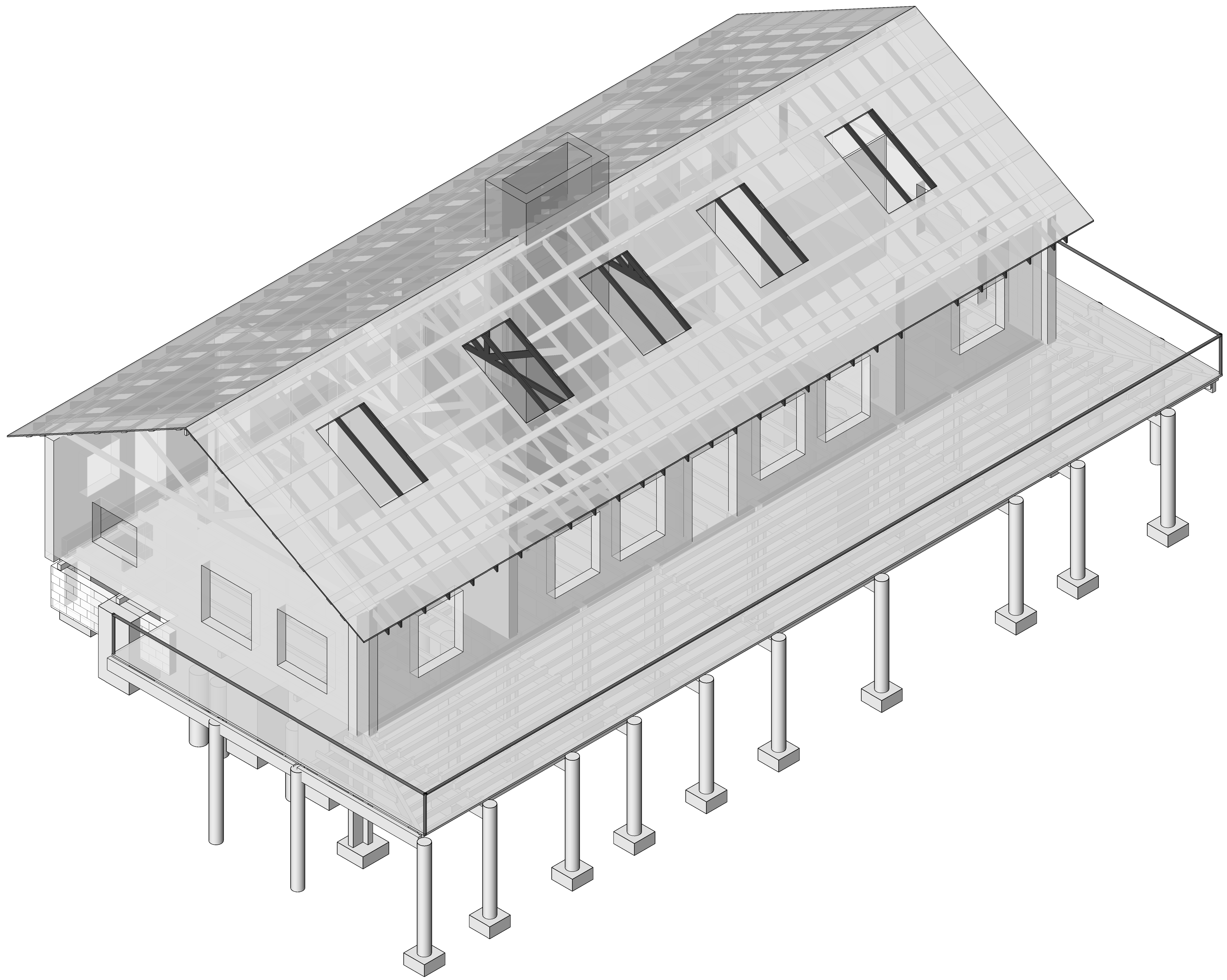
LA HONDA CREEK REDWOOD CABIN
DESIGN ALTERNATIVE #1



Attachment 4

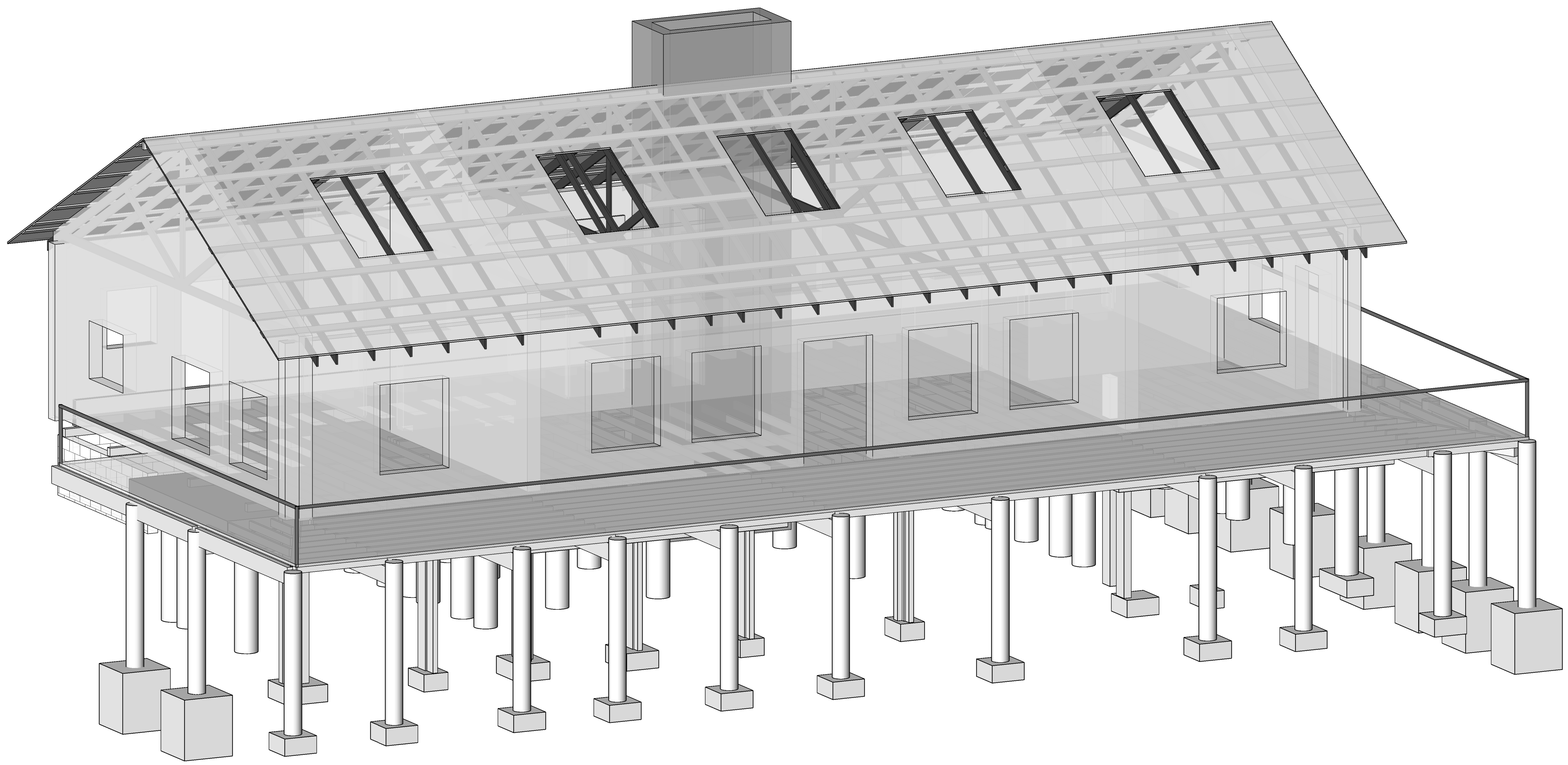
LA HONDA CREEK REDWOOD CABIN
DESIGN ALTERNATIVE #2

OPTION 2



OPTION 3

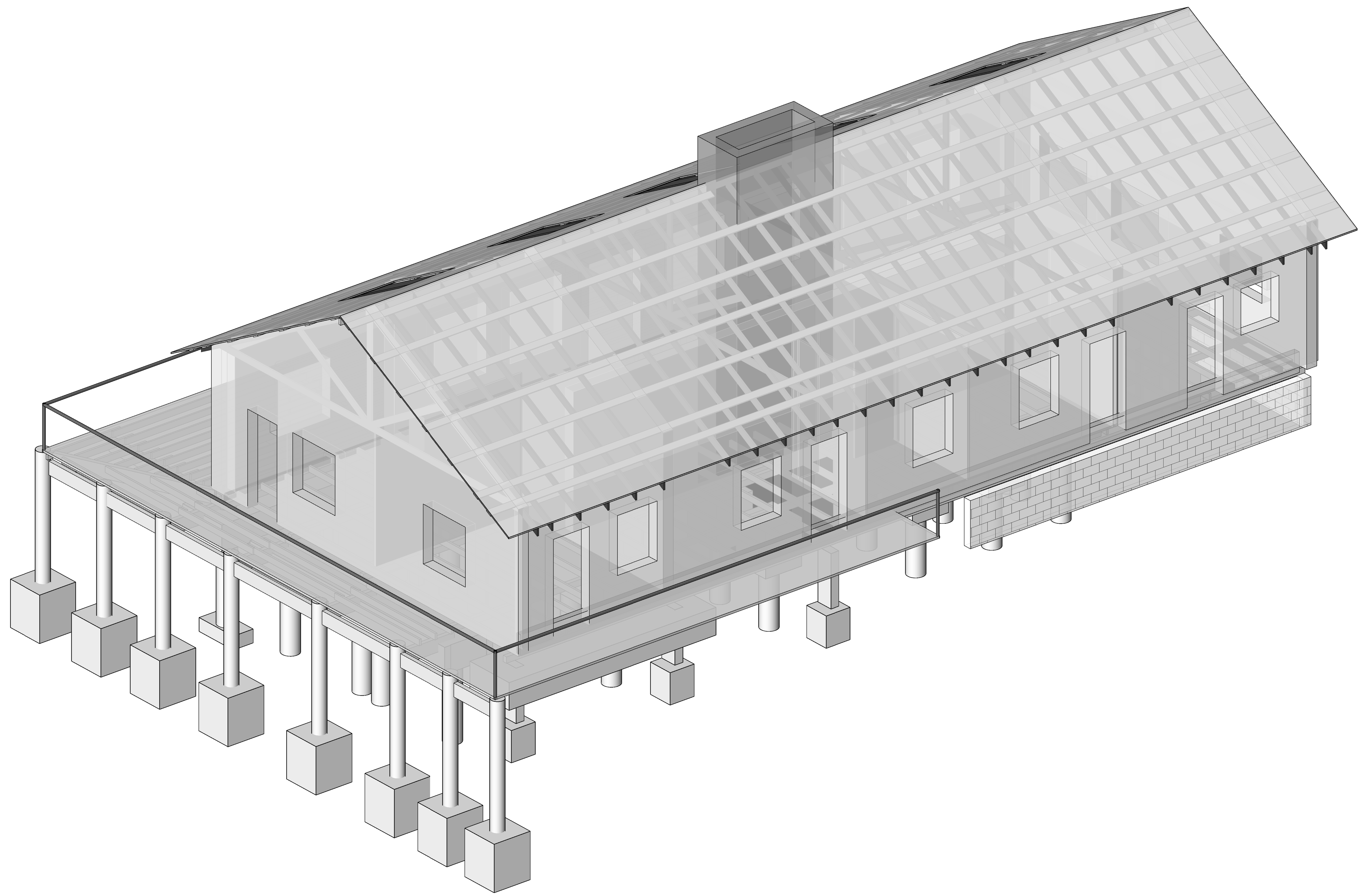
LA HONDA CREEK REDWOOD CABIN
DESIGN ALTERNATIVE #3



Attachment 4

LA HONDA CREEK REDWOOD CABIN
DESIGN ALTERNATIVE #3

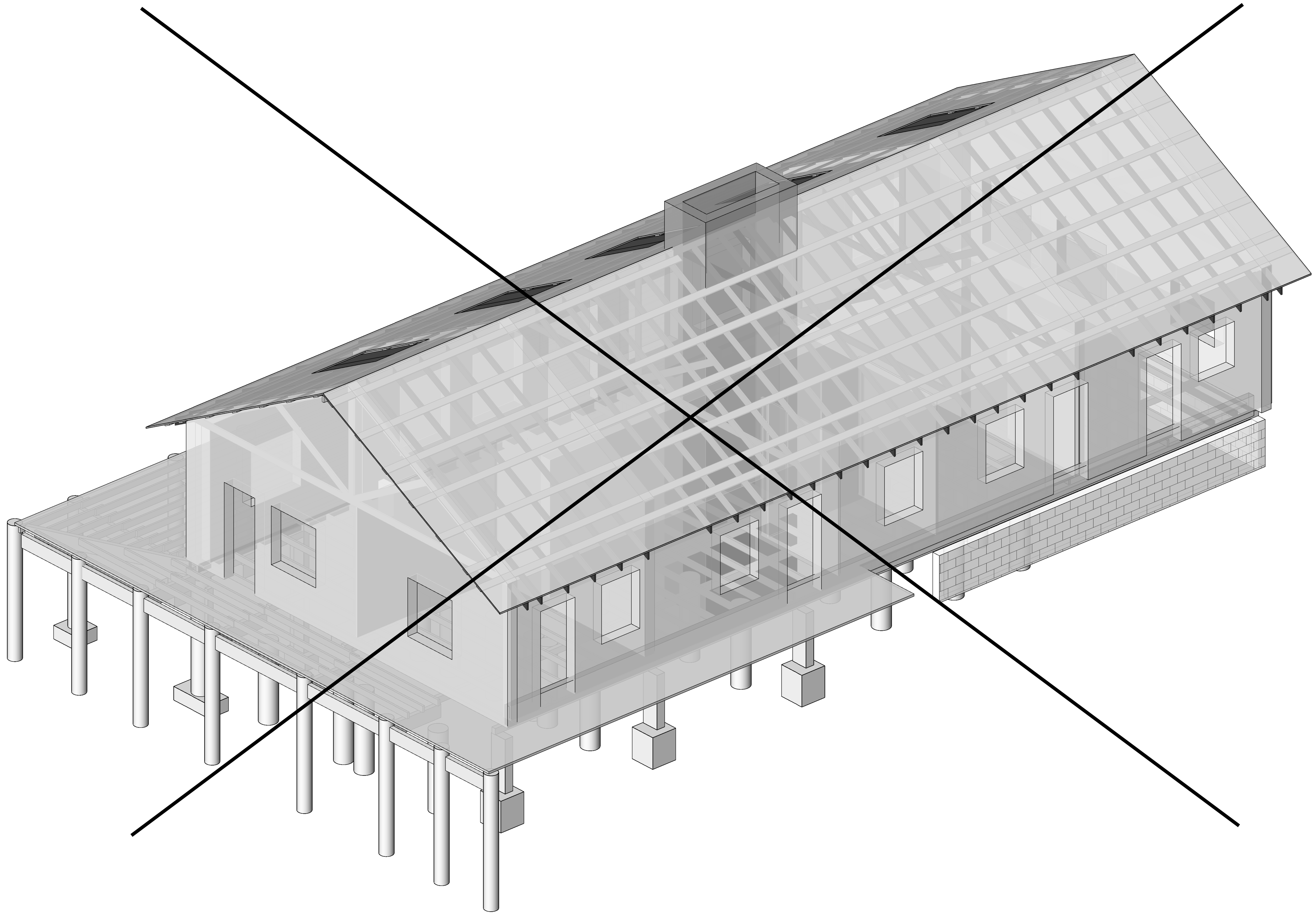
OPTION 3



Attachment 4

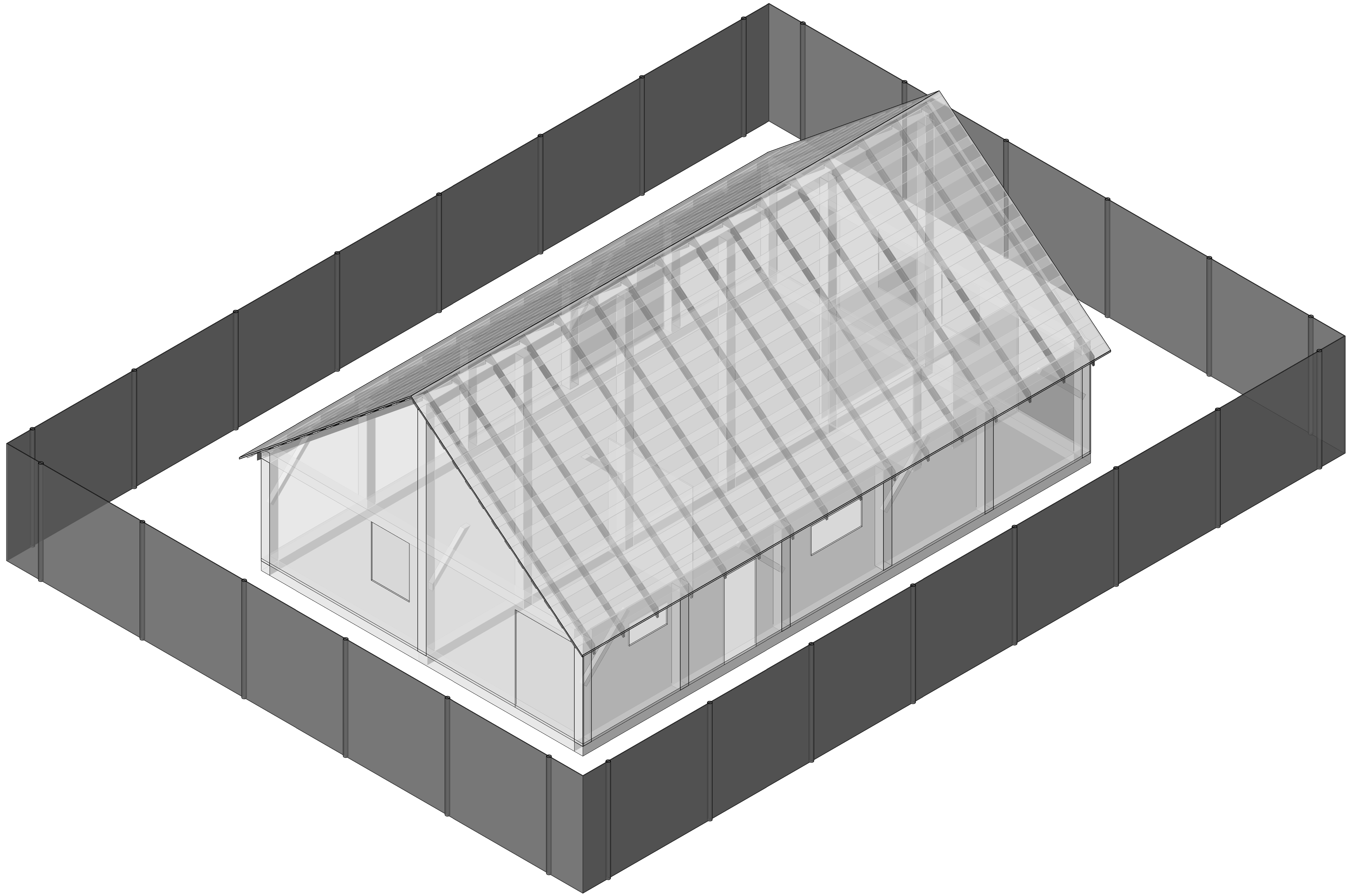
LA HONDA CREEK REDWOOD CABIN
DESIGN ALTERNATIVE #4

OPTION 4



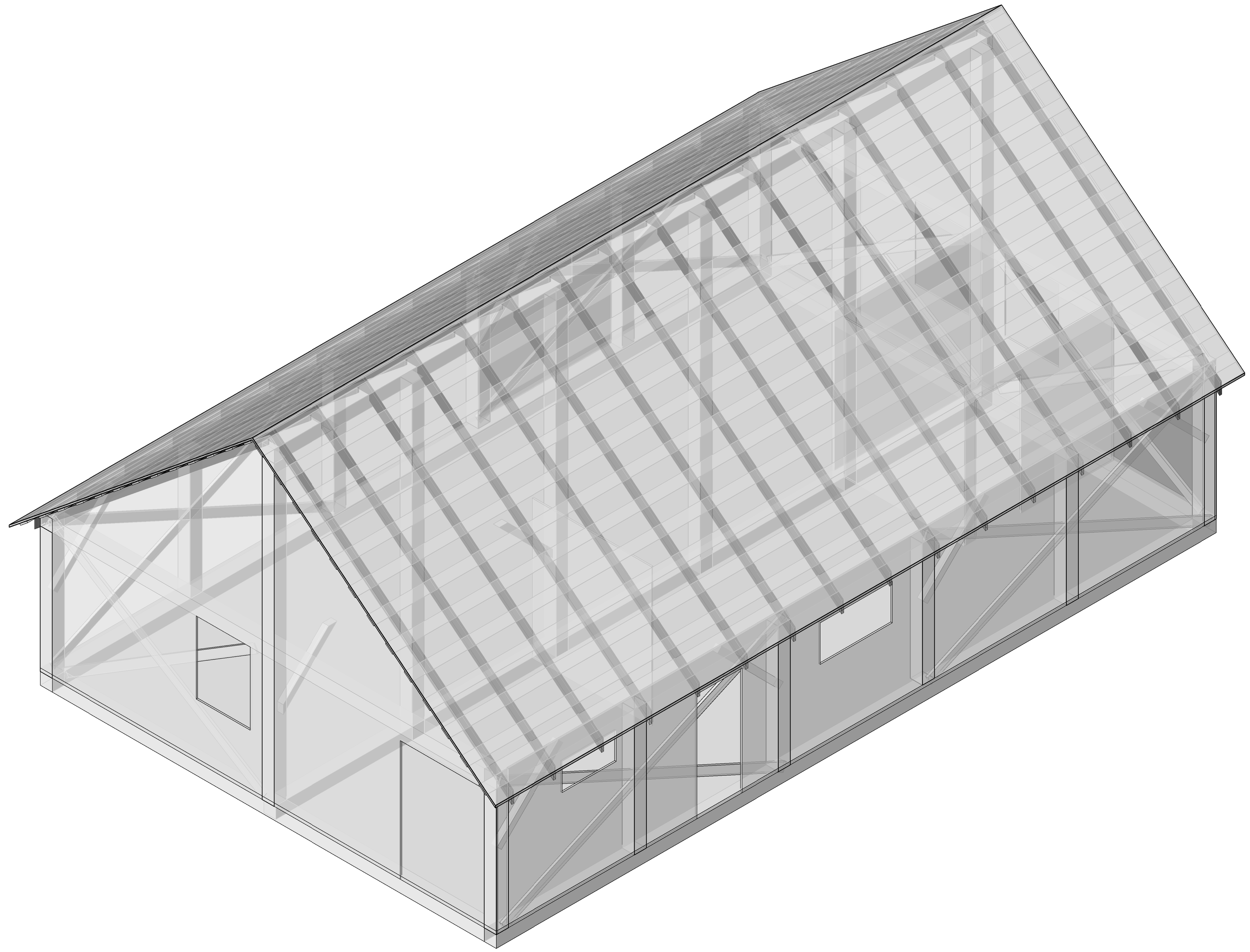
Attachment 5

LA HONDA CREEK WHITE BARN
DESIGN ALTERNATIVE #1



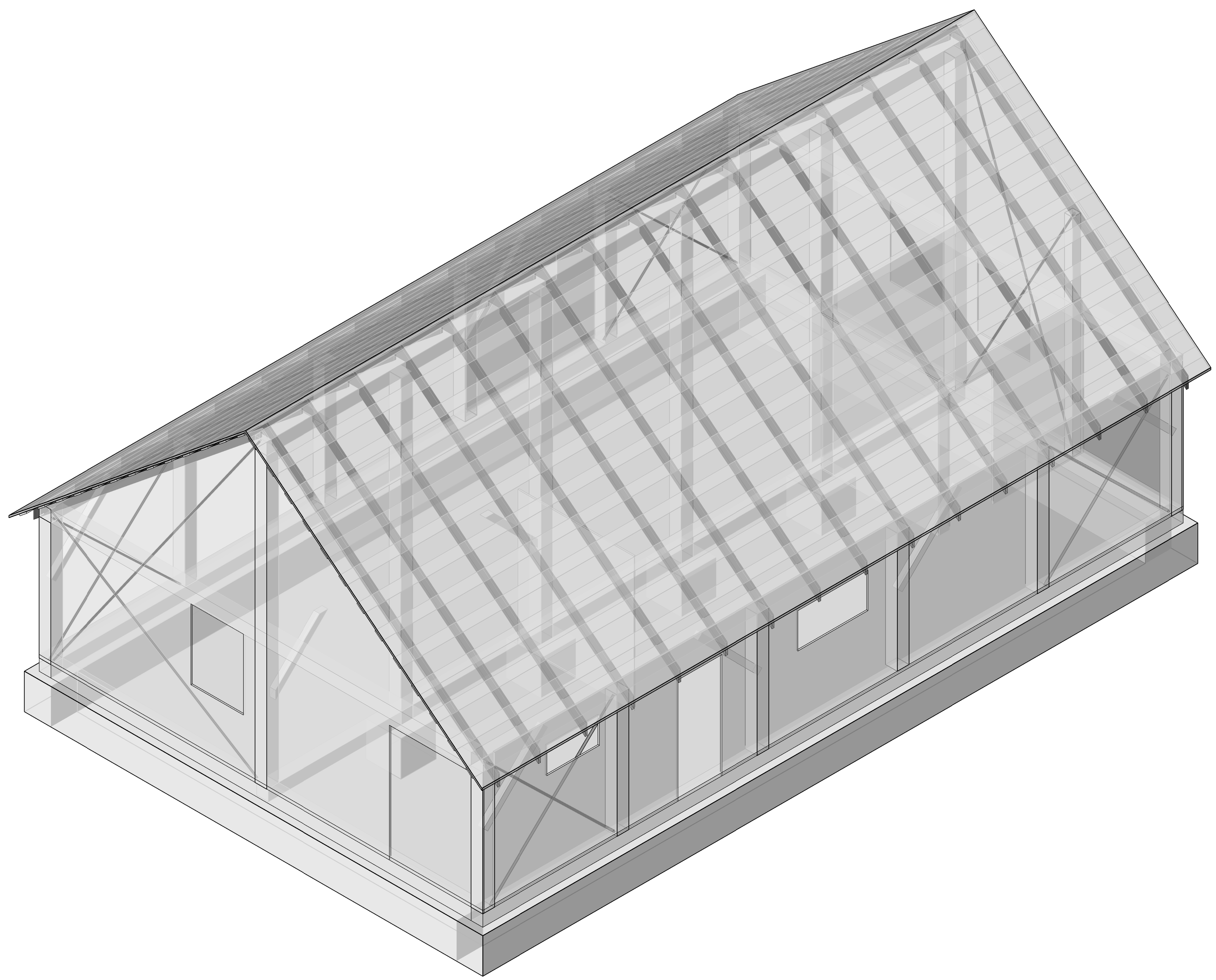
Attachment 5

LA HONDA CREEK WHITE BARN
DESIGN ALTERNATIVE #2

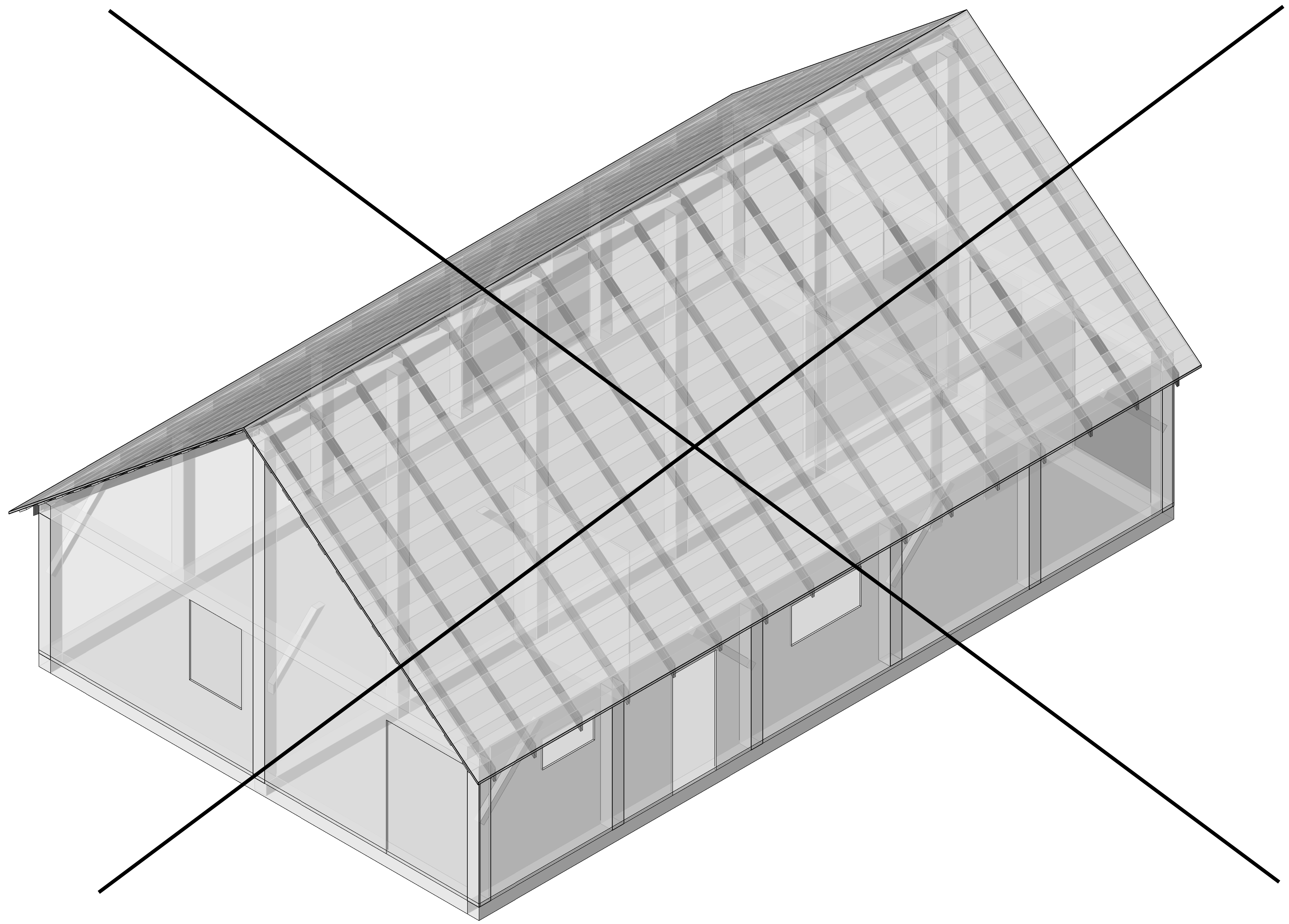


Attachment 5

LA HONDA CREEK WHITE BARN
DESIGN ALTERNATIVE #3



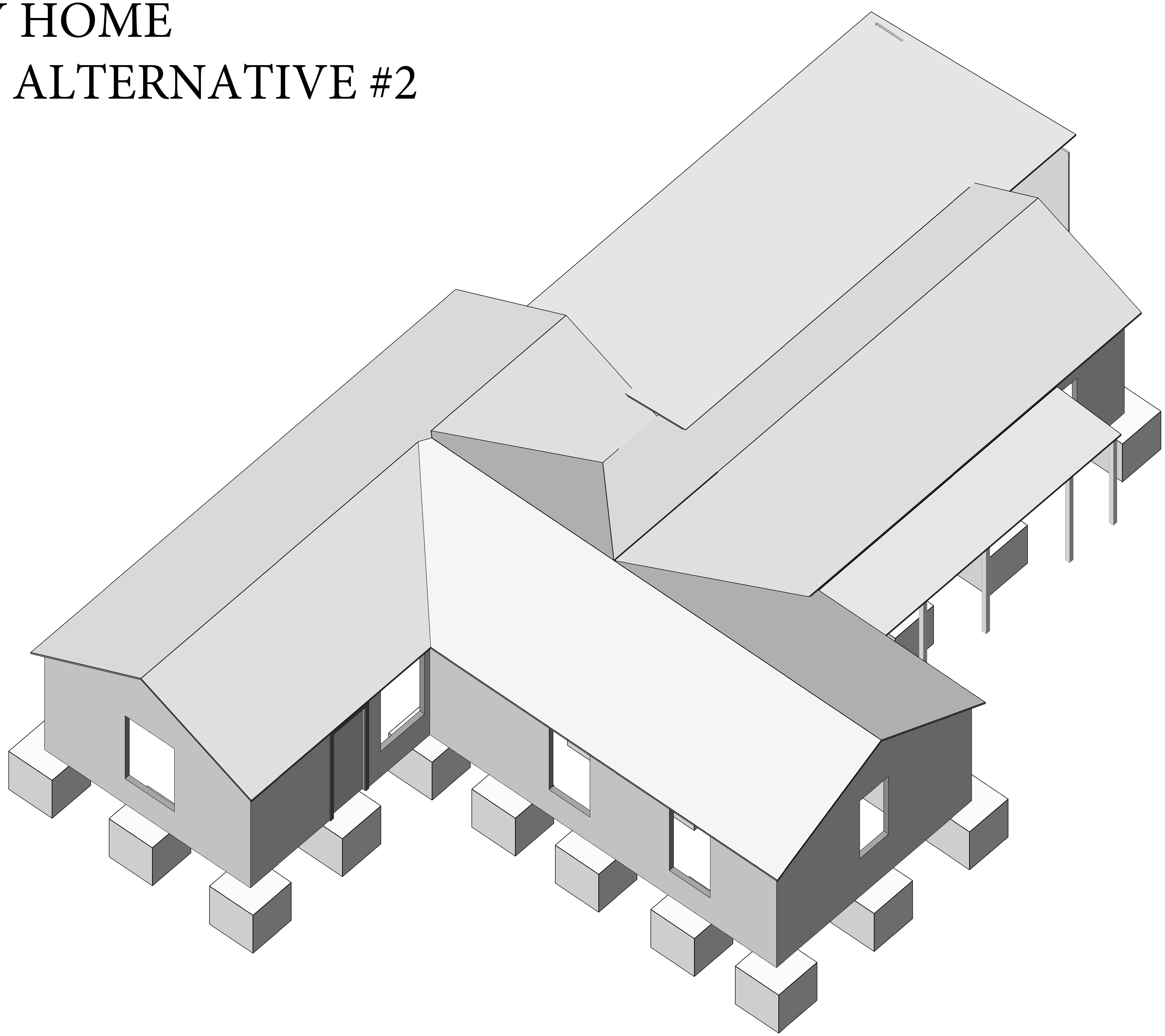
LA HONDA CREEK WHITE BARN
DESIGN ALTERNATIVE #4



Attachment 6

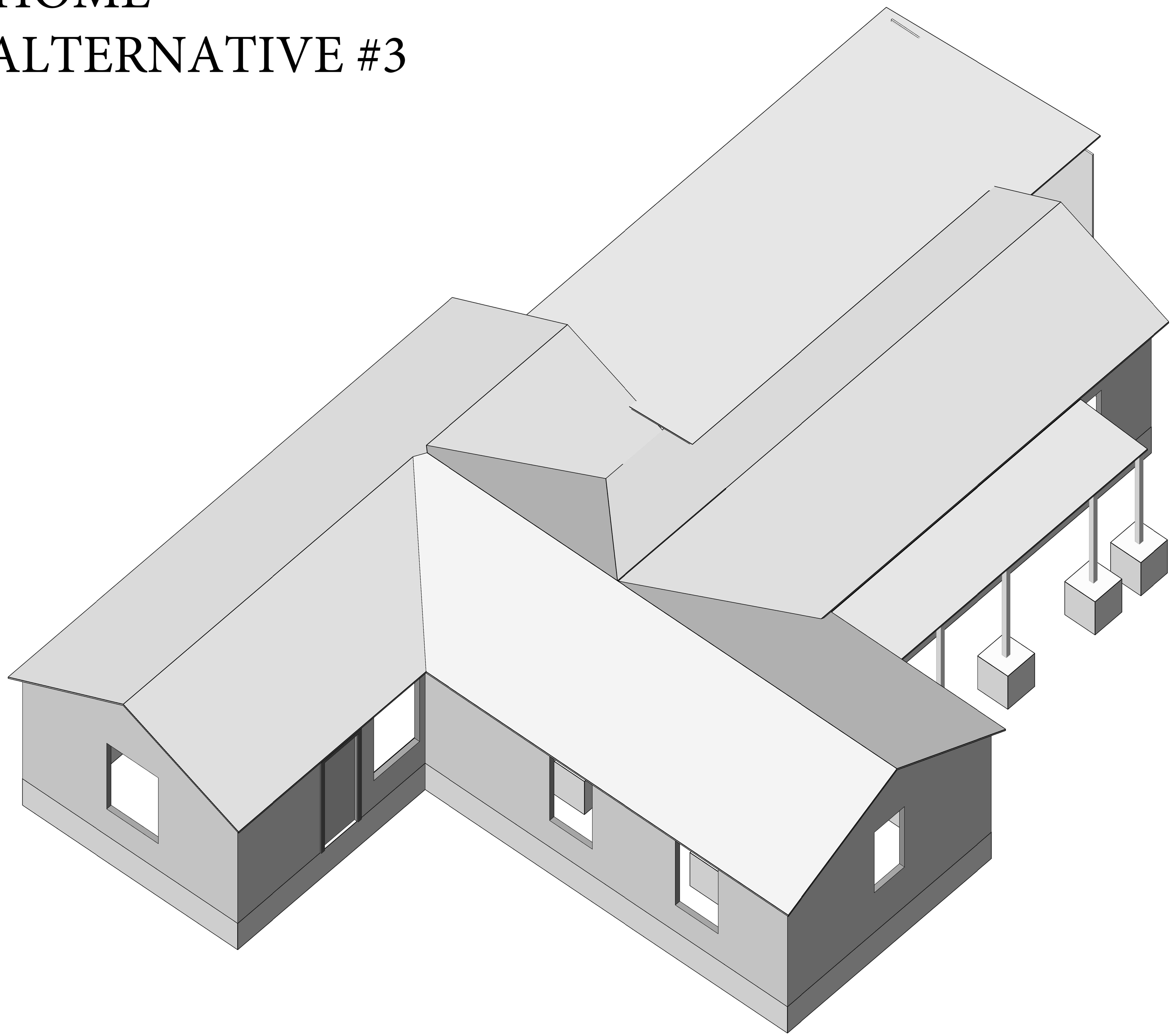
BEATTY HOME
DESIGN ALTERNATIVE #1

BEATTY HOME
DESIGN ALTERNATIVE #2



Attachment 6

BEATTY HOME
DESIGN ALTERNATIVE #3



BEATTY HOME
DESIGN ALTERNATIVE #4