Midpeninsula Regional
Open Space District

R-21-124
Meeting 21-28
September 22, 2021

AGENDA ITEM 9

AGENDA ITEM

Contract Amendment for Engineering Services with ZFA Structural Engineers to complete Phase II of the La Honda Creek White Barn Structural Stabilization Project

GENERAL MANAGER'S RECOMMENDATIONS

1. Authorize the General Manager to execute a contract amendment in the amount of $109,727 with ZFA Structural Engineers of San Carlos, California to provide conceptual design drawings, construction documents, and bidding and construction administration for Phase II of the La Honda Creek White Barn Structural Stabilization Project, bringing the contract to a not-to-exceed amount of $312,857.

2. Authorize an additional 10% contingency of $10,973 to be reserved for unanticipated issues, bringing the amended total not-to-exceed contract amount to $323,830.

SUMMARY

On May 15, 2019, the Board of Directors (Board) approved a contract with ZFA Structural Engineers (ZFA) for $203,130 to provide Phase I structural assessment and analysis services for La Honda Creek (LHC) Redwood Cabin, LHC White Barn, and Sierra Azul Beatty House. ZFA completed their scope, and the findings were presented to the Board in April 2020. For the LHC White Barn, the Board selected the option to stabilize the structure and directed the General Manager to return with a recommended award of contract for Phase II design development and implementation of the Board-selected alternative. Given ZFA's technical qualifications and relevant experience, high-quality Phase I work product, and institutional knowledge of the project, the General Manager recommends amending ZFA's contract to perform additional services, including preparation of conceptual design drawings, construction documents, and bidding and construction administration support in the amount of $109,727, for a not-to-exceed contract amount of $312,857. Additionally, the General Manager recommends a 10% contingency of $10,973 to address unforeseen conditions, bringing the total not-to-exceed contract amount to $323,830.

DISCUSSION

The purpose of the Structure Stabilization at Multiple Preserves Project was to assess and determine the disposition of three District-owned structures: LHC Redwood Cabin, LHC White Barn, and Sierra Azul Beatty Property Home. A Request for Proposals (RFP) was issued in January 2019 to solicit qualifications and proposals for Phase I of the project: structure assessment, basis of design report, and design alternative analysis. The RFP also stated that the Project would be divided into two phases, and that the consultant selected to complete Phase I

may also be selected to complete Phase II: design development and implementation of the Board selected alternatives. 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).

The following four design alternatives were presented to the Board for their review and approval of each structure:

1. Retain structure in current state. Address public safety issues and restrict perimeter access to the structures; structure remains visible from a distance.
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.
3. Repair and rehabilitate the structure for reuse. Structure is visible and accessible from the exterior and interior.
4. Remove the structure and restore the underlying natural resource values.

On April 22, 2020, the Board selected a modified design alternative #2 for the LHC White Barn (R-20-39). With the selection of the design alternatives for the LHC White Barn and the other two structures, the project was separated into three projects to track the implementation of the respective alternatives. The contract amendment described in this report is for the LHC White Barn implementation only.

<u>La Honda Creek (LHC) White Barn</u>
The LHC White Barn, originally constructed sometime prior to 1860, is located in the upper portion of La Honda Creek Open Space Preserve. 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. 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 wood floor. The White Barn is 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.

On April 22, 2022, the Board selected an enhanced design alternative #2 to stabilize the structure, upgrade the foundation, and explore wildlife exclusion, interpretive signage, and plexiglass coverings to allow public viewing from the exterior. In addition, the Board directed staff to explore options for exterior coatings, including both white and semi-transparent options.

A Request for Proposals at the start of this project solicited pricing for both Phase I and Phase II consultant services, although only Phase I services were initially approved by the Board. To deliver the Board's selected design alternative, Staff requested ZFA to update their previously submitted proposal to provide Phase II design services. Staff reviewed the updated proposal and negotiated their fee down by approximately 20%. Staff has determined that entering into a contract amendment with ZFA is a practical and cost-effective way to move the project forward to completion. ZFA has demonstrated their strong technical qualifications, relevant experience and institutional knowledge of the project. ZFA will include Page & Turnbull, a qualified historic architectural consultant, on their team to complete the Phase II work.

Therefore, the General Manager recommends amending ZFA's existing contract by $109,727 to complete Phase II, including conceptual design, construction documents, bidding and construction administration. The General Manager further recommends authorizing a 10% contingency of $10,973 to address unforeseen issues, bringing the total amended contract amount to $323,830.

Note that the original ZFA contract covered studies for three structures. The total cost for LHC White Barn alone (Phase I and Phase II) is $184,960 out of the total contract amount of $323,830.

The original contract breakdown by project is shown in the table below.

Structure Stabilization at Multiple Preserves Project Original Contract	**Base**	**Contingency**	**Proposed Amendments**	**Totals**
MAA05-008 La Honda Creek White Barn Structural Rehabilitation (White Barn)	$55,878	$8,382	**$120,700**	**$184,960**
MAA05-009 La Honda Creek Redwood Cabin Removal and Site Restoration (Redwood Cabin)	$66,796	$10,019		**$76,815**
MAA22-004 Beatty Parking Area and Trail Connections (Beatty Property Home)	$53,961	$8,094		**$62,055**
	$176,635	**$26,495**	**$120,700**	**$323,830**

FISCAL IMPACT

The FY22 adopted budget includes $210,137 for the La Honda Creek White Barn Structural Rehabilitation MAA05-008 project. There are sufficient funds in the project budget to cover the recommended action and expenditures.

La Honda Creek White Barn Structural Rehabilitation MAA05-008	**Prior Year Actuals**	**FY22 Adopted**	**FY23 Projected**	**FY24 Projected**	**TOTAL**
Total Budget:	**$142,811**	**$210,137**	**$226,797**	**$0**	**$579,745**
Spent-to-Date (as of 08/31/21):	($142,811)	($4,253)	$0	$0	**($147,064)**
Encumbrances:	$0	($40,000)	$0	$0	**($40,000)**
ZFA Structural Engineers Contract Amendment:	$0	($83,000)	($26,727)	$0	**($109,727)**
10% Contingency:	$0	($8,300)	($2,673)	$0	**($10,973)**
Budget Remaining (Proposed):	**$0**	**$74,584**	**$197,397**	**$0**	**$271,981**

The following table outlines the Measure AA Portfolio 05 La Honda Creek - Upper Area Recreation, Habitat Restoration and Conservation Grazing Projects allocation, costs-to-date, projected future project expenditures and projected portfolio balance remaining.

MAA05 La Honda Creek—Upper Area Recreation, Habitat Restoration and Conservation Grazing Projects Portfolio Allocation:	**$11,733,000**
Total Portfolio Allocation:	**$11,733,000**
Life-to-Date Spent (as of 08/31/21):	($2,680,804)
Encumbrances:	($180,315)
Remaining FY22 Project Budgets:	($591,736)
Future MAA05 project costs (projected through FY25):	($2,748,382)
Total Portfolio Expenditures:	**($6,201,237)**
Portfolio Balance Remaining (Proposed):	**$5,531,763**

The following table outlines the Measure AA Portfolio 05 La Honda Creek- Upper Area Recreation, Habitat Restoration and Conservation Grazing Projects, projected life of project expenditures and projected portfolio balance remaining.

MAA05 La Honda Creek—Upper Area Recreation, Habitat Restoration and Conservation Grazing Projects Portfolio Allocation:	**$11,733,000**
Total Portfolio Allocation:	**$11,733,000**
05-001 La Honda Creek Land Conservation Opportunities	($1,756,093)
05-002 Upper La Honda Creek Grazing Infrastructure	($297,432)
05-005 La Honda Creek Red Barn Parking Area and Easy Access Trail	($327,513)
05-007 La Honda Creek Phase II Trail Connection	($471,622)
05-008 La Honda Creek White Barn Structural Rehabilitation	($579,745)
05-009 La Honda Creek Redwood Cabin Removal and Site Restoration	($624,349)
05-010 Restoration Forestry Demonstration Project	($1,317,899)
05-011 Lone Madrone Ranch Fence Installation	($201,987)
05-012 Phase 2 - Paulin Bridge Replacements (2)	($624,597)
Total Portfolio Expenditures:	**($6,201,237)**
Portfolio Balance Remaining (Proposed):	**$5,531,763**

BOARD AND COMMITTEE REVIEW

The assessment of the LHC White Barn and exploration of different preservation and stabilization alternatives previously came before the full Board at the following public meetings:

- **April 24, 2019**: Board review of contract with ZFA for structural assessment and construction documents for stabilization of three structure. (R-19-51, meeting minutes)
- **May 15, 2019**: Board review and authorization of contract with ZFA for assessment of structures and exploration of different preservation and stabilization alternatives. (R-19-63, meeting minutes)
- **April 22, 2020**: Board review of ZFA's Basis of Design and selection of Design Alternative #2 – Stabilization for the LHC White Barn (R-20-39, meeting minutes)
- **November 4, 2020**: Board review and authorization of contract with Ascent Environmental to provide environmental consulting services (R-20-127, meeting minutes)

PUBLIC NOTICE

Public notice will be provided as required by the Brown Act.

CEQA COMPLIANCE

Retention of professional consultants is not a project under the California Environmental Quality Act (CEQA). Under a contract authorized by the Board in November 2020, a District consultant is currently finalizing an Addendum to the LHC Master Plan Initial Study/Mitigated Negative Declaration (IS/MND) to analyze potential environmental impacts related to the structural stabilization construction activities associated with the implementation of this project. Staff

anticipates presenting the Addendum to the IS/MND to the Board for adoption prior to the construction of the project.

NEXT STEPS

Pending Board approval, the General Manager will authorize WJE's contract amendment to develop construction documents for the Board-selected stabilization option for the LHC White Barn. Construction is anticipated in Spring/Summer of 2022.

Attachment:
1. LHC White Barn Basis of Design, Condition Assessment, and Estimate – ZFA Dec. 2019

Responsible Department Head:
Jason Lin, PE, Engineering and Construction Department Manager

Prepared by:
Paul Kvam, Capital Project Manager III, Engineering and Construction Department

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

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EXHIBITS

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.

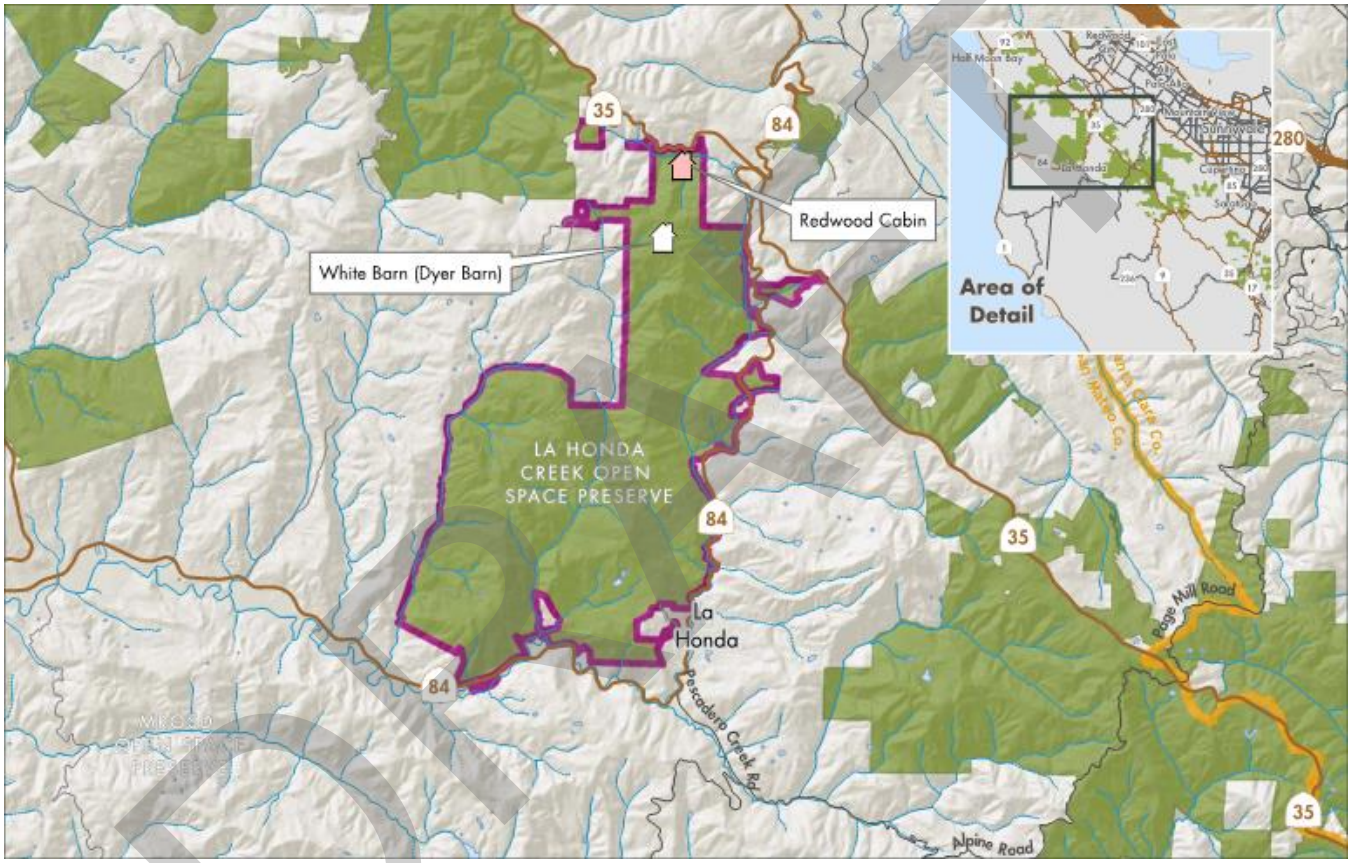

Figure 1. Project Area Map

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

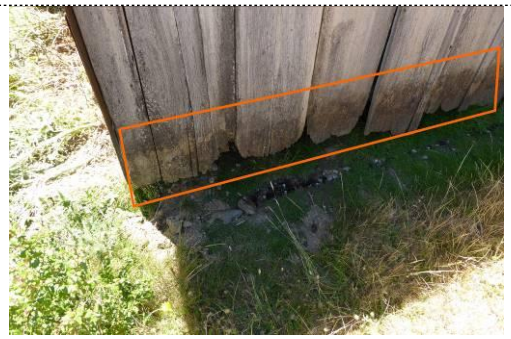

Figure 4

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

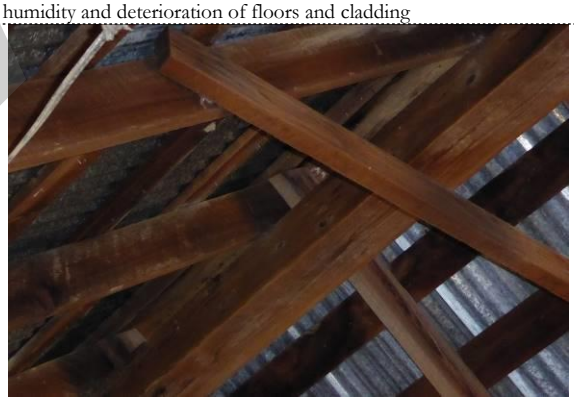

Figure 12

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

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

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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

General Site Description

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.

Structural Performance Objective

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.

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 1.556g 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

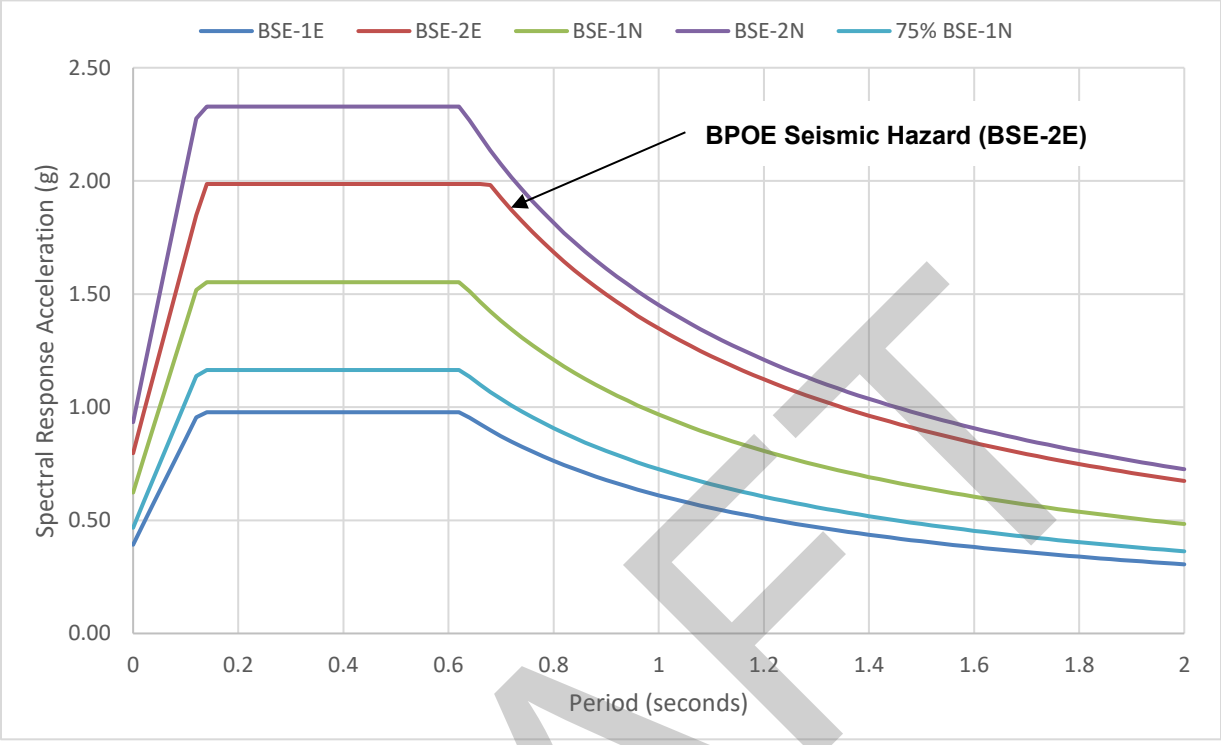
*Where S_{XS} and S_{X1} values fall in different levels of seismicity, the higher level shall be used.

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.

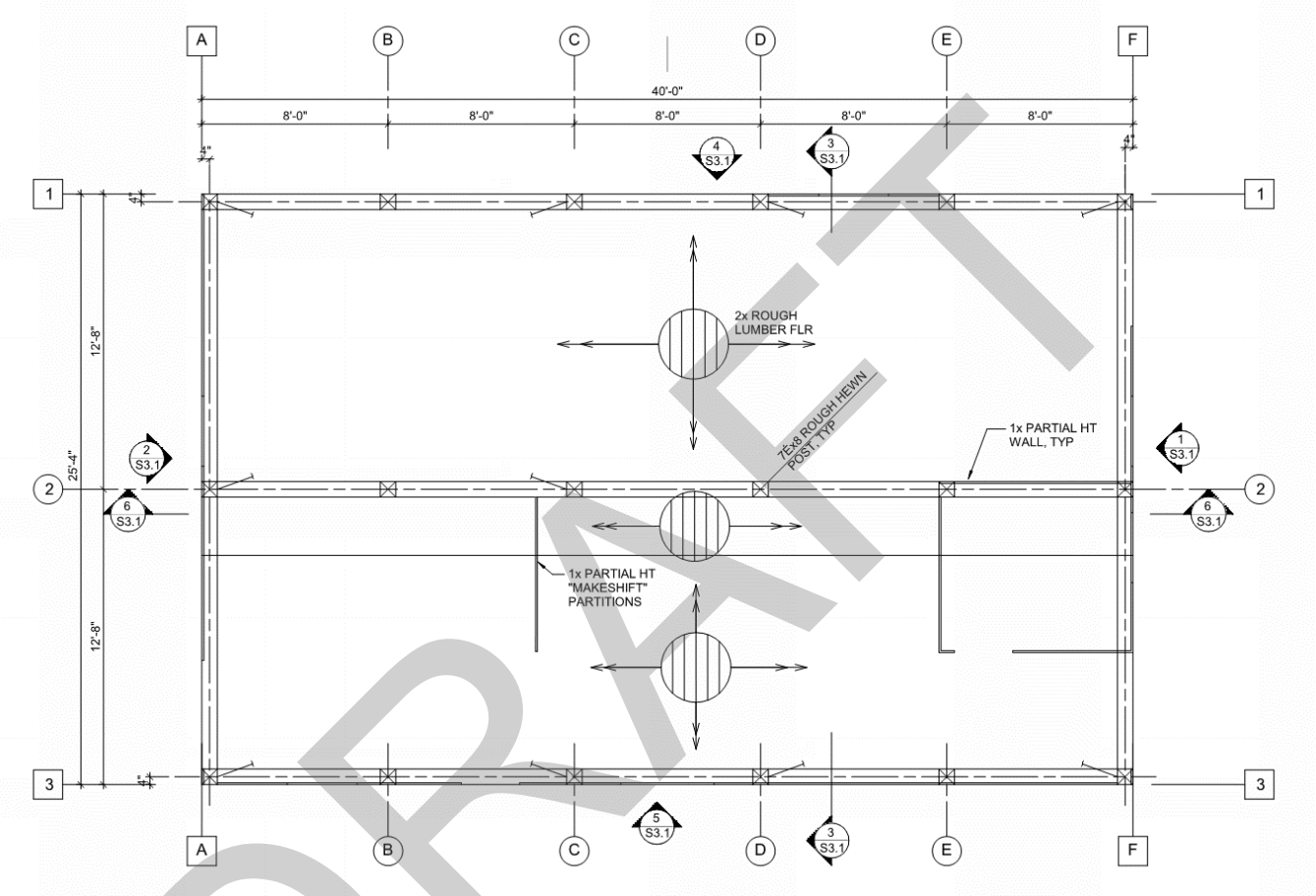


Figure 1: Existing Ground Floor Framing Plan developed by ZFA

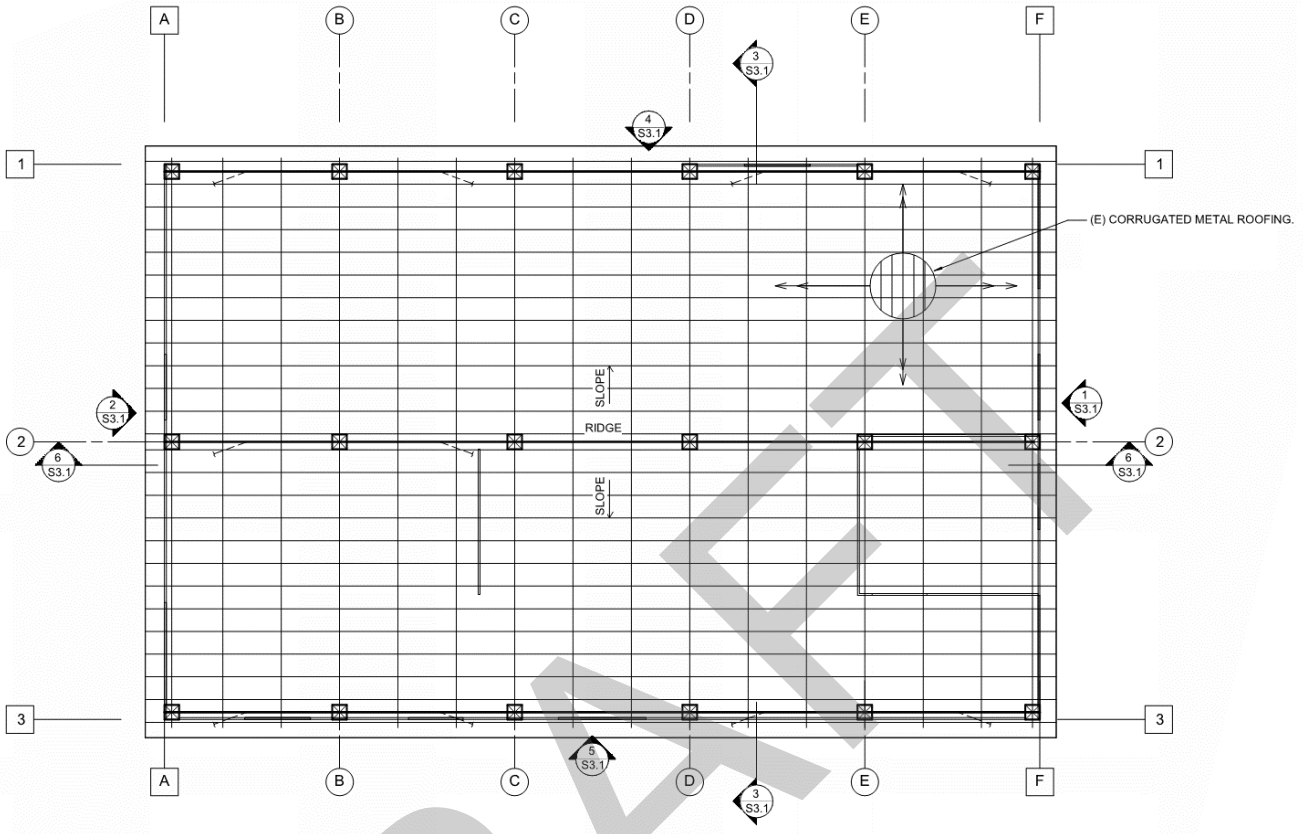


Figure 2. Existing Roof Framing Plan developed by ZFA

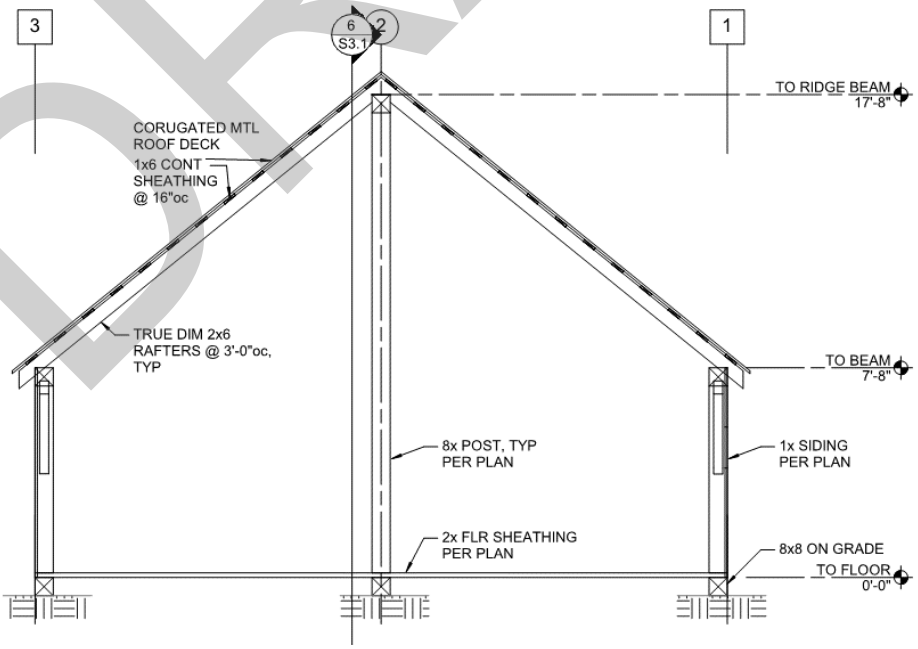


Figure 3. Transverse Section Through Building developed by ZFA

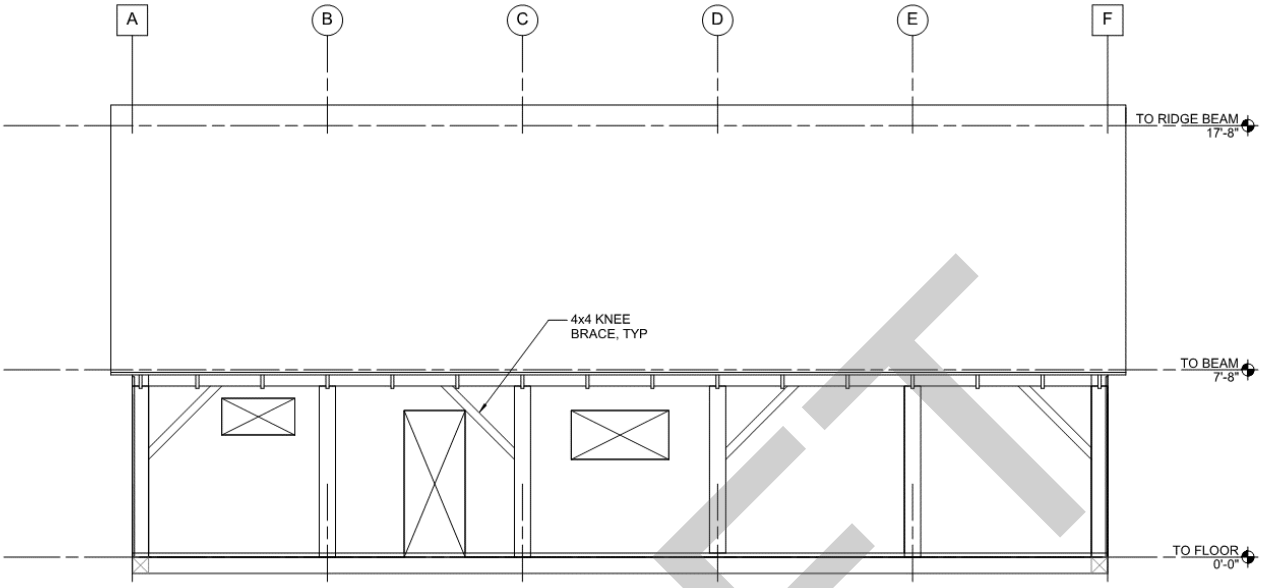


Figure 4. South Elevation developed by ZFA

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.

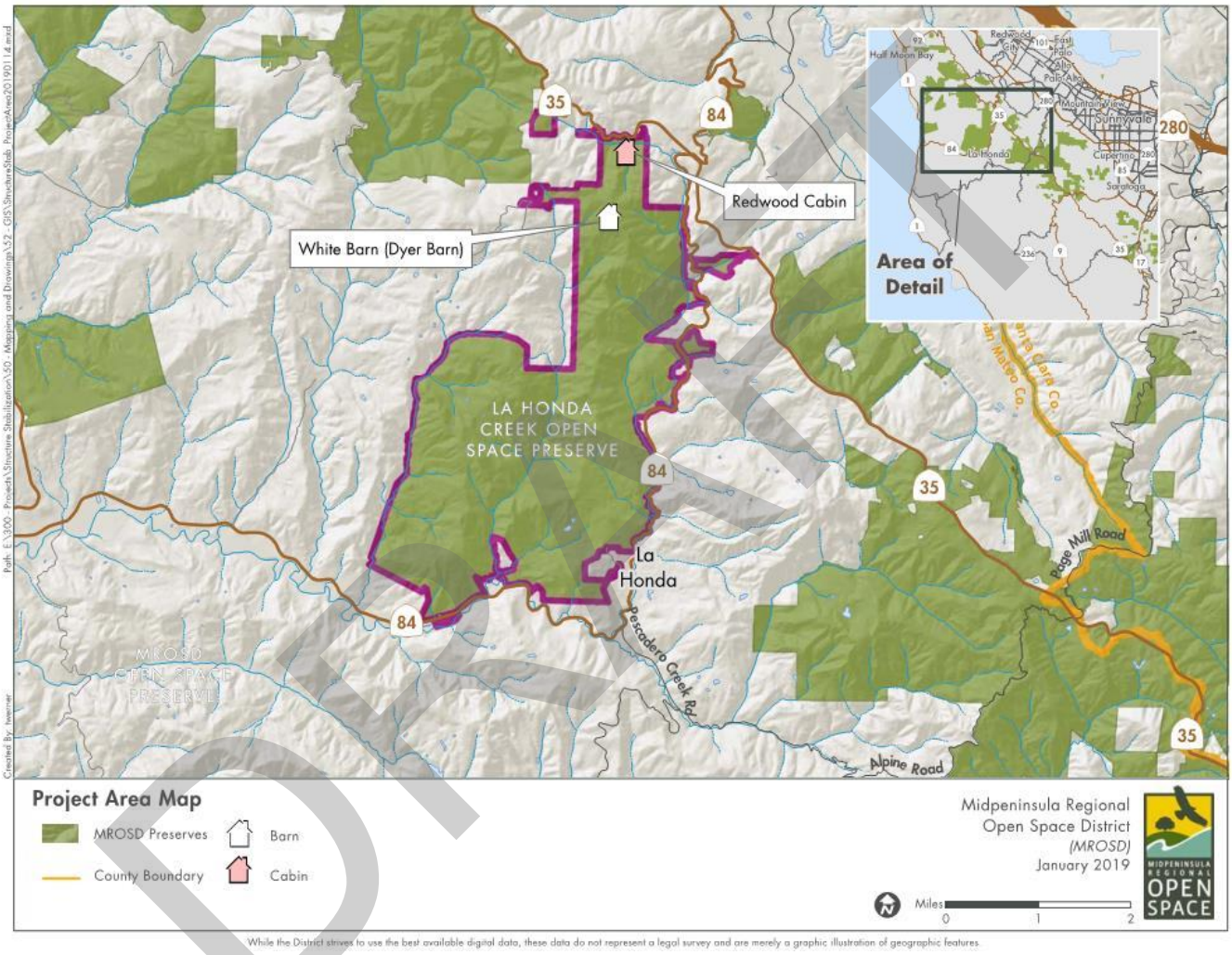
This report is general in nature and does not imply that the recommendations listed above are the only structural requirements that must be made to the existing structure to meet current code criteria.

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.

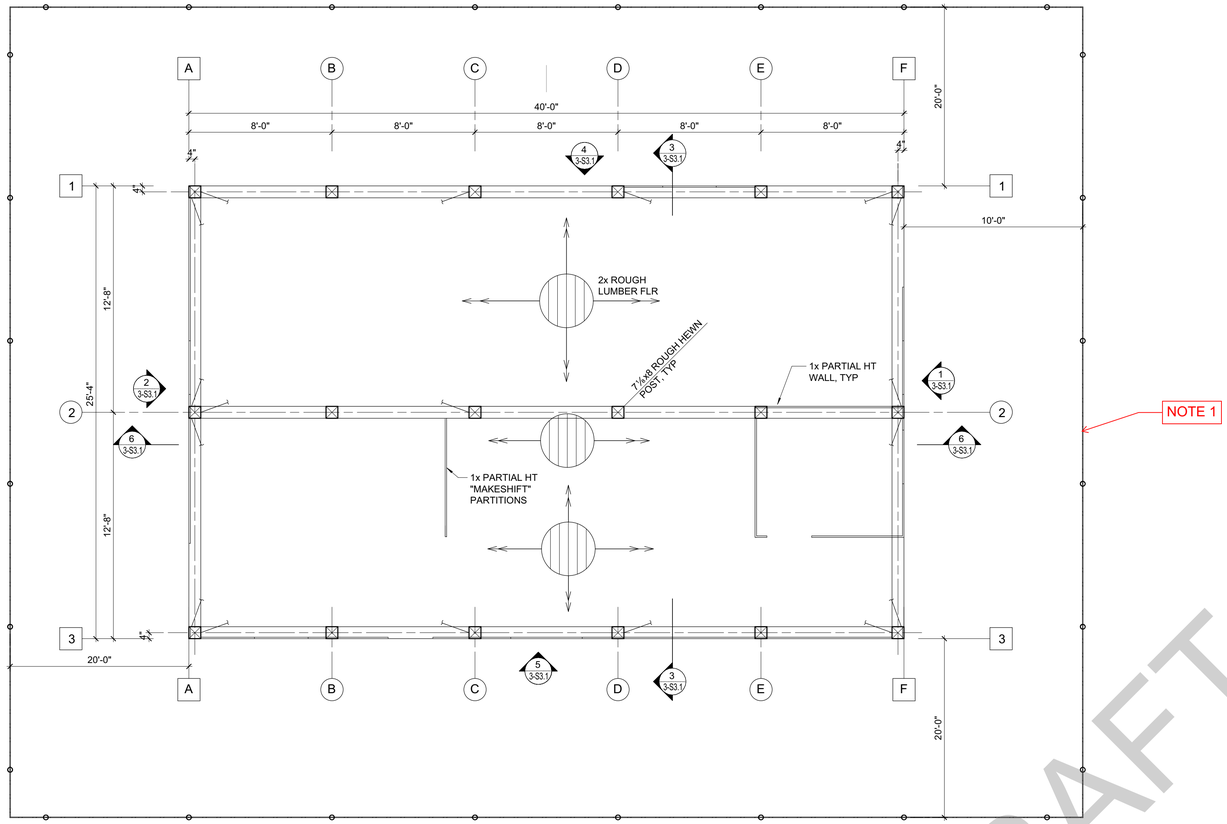
Steven Patton, SE
Senior Associate

Mark Moore, SE
Executive Principal

APPENDIX A – SITE MAP


Redwood Cabin
White Barn (Dyer Barn)
LA HONDA CREEK OPEN SPACE PRESERVE
MROSD OPEN SPACE PRESERVE
La Honda
Pescadero Creek Rd
Alpine Road
Page Mill Road
Area of Detail
35
84
280
Project Area Map
MROSD Preserves
County Boundary
Barn
Cabin
Midpeninsula Regional Open Space District (MROSD) January 2019
Miles
0
1
2
MIDPENINSULA REGIONAL 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.

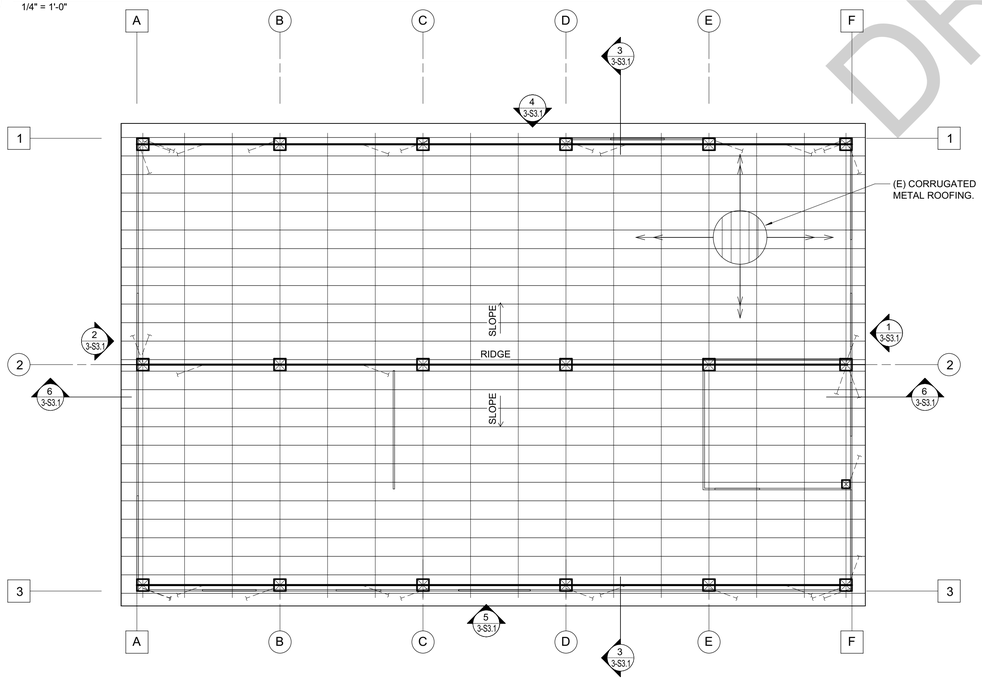
APPENDIX B – STRUCTURAL STABILIZATION BASIS OF DESIGN ALTERNATIVES



NORTH

FLOOR PLAN BOD OPTION 1

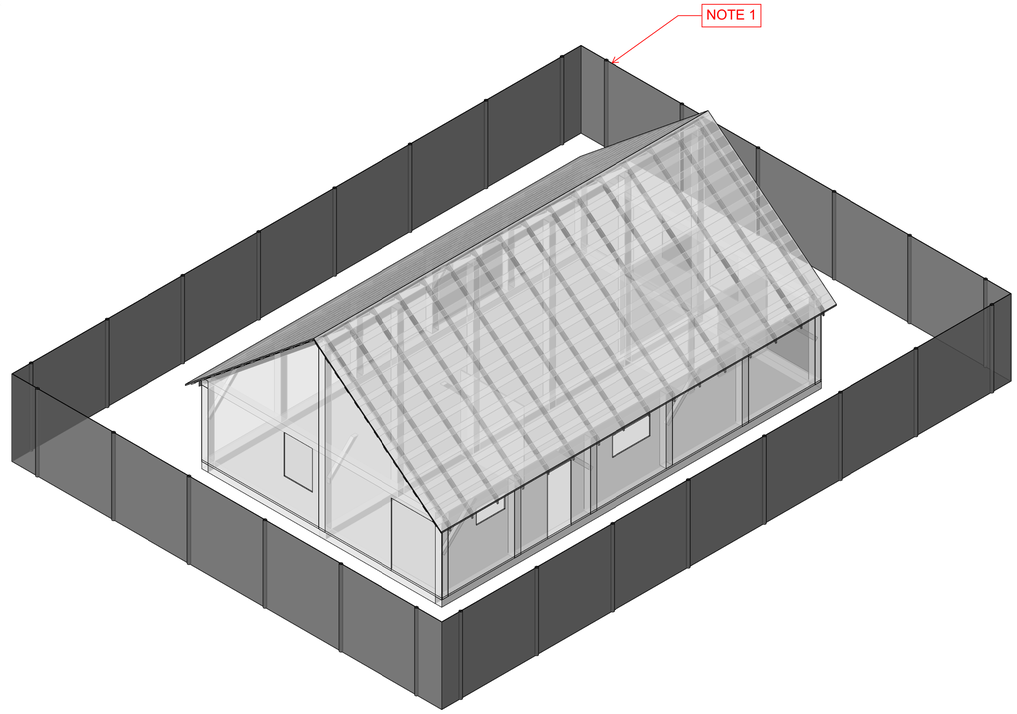
1/4" = 1'-0"



NORTH

ROOF FRAMING PLAN BOD OPTION 1

1/4" = 1'-0"



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.

PRINT TO 11x17

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

DYER BARN
BOD OPTION 1
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

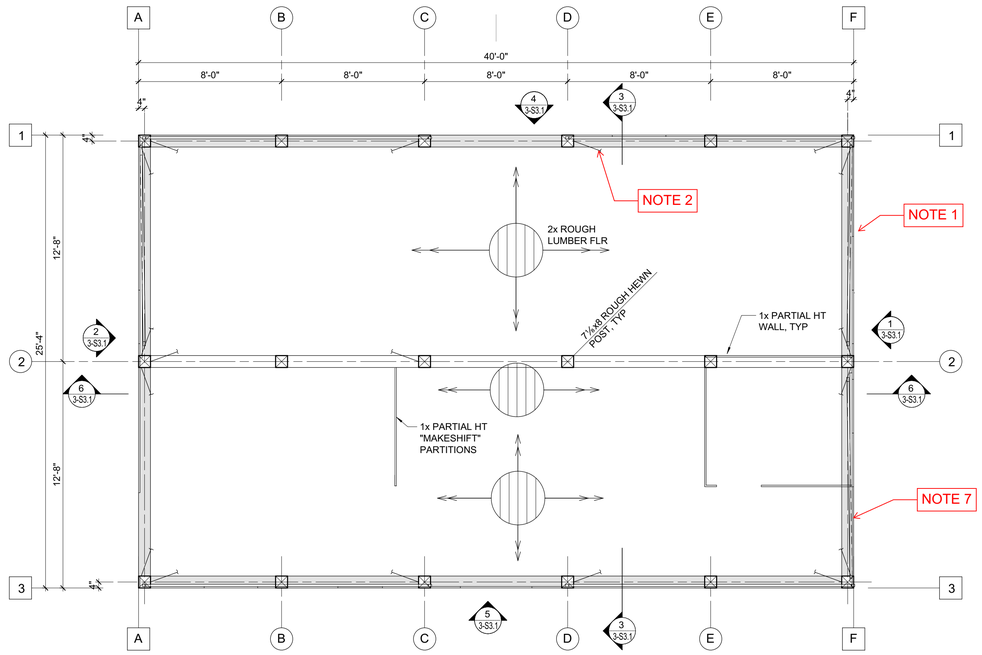
FLOOR AND ROOF FRAMING PLANS

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

SHEET

1-S2.1

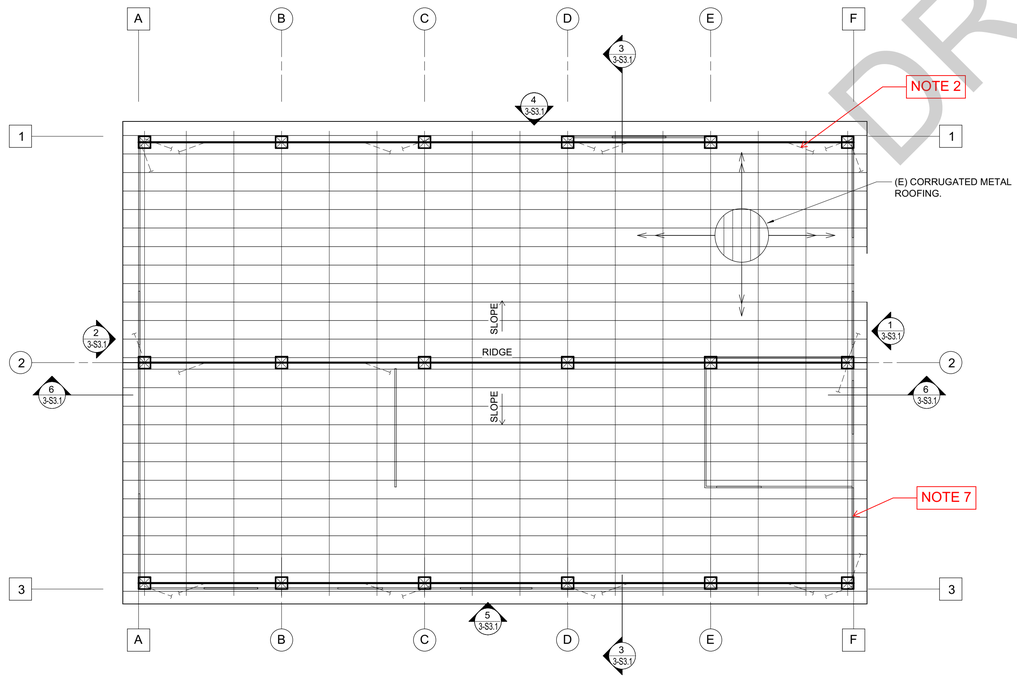
BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION



NORTH

FLOOR PLAN BOD OPTION 2

1/4" = 1'-0"



NORTH

ROOF FRAMING PLAN BOD OPTION 2

1/4" = 1'-0"

PRINT TO 11x17

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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.

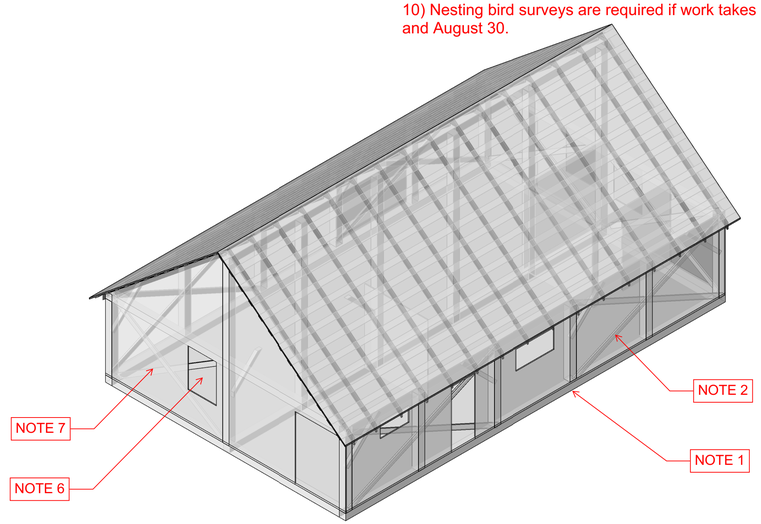
6) Deteriorated elements of the building envelope, including siding, doors, and windows, should be repaired; where elements have deteriorated beyond repair or are missing, they should be replaced in-kind to match the existing sound elements. Fenestration that is currently boarded-up from the exterior 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

Attachment 1

Revision Schedule

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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

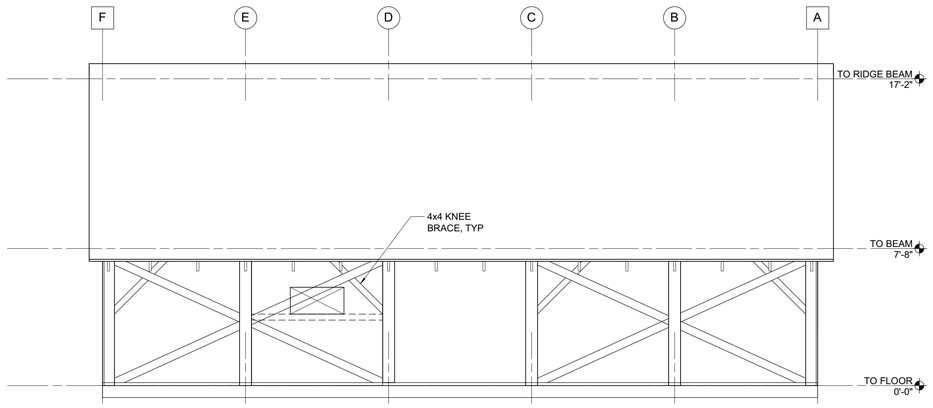
FLOOR AND ROOF FRAMING PLANS

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

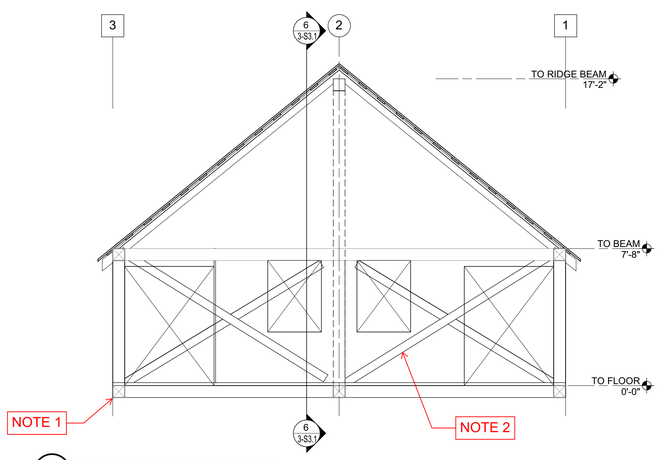
SHEET

2-S2.1

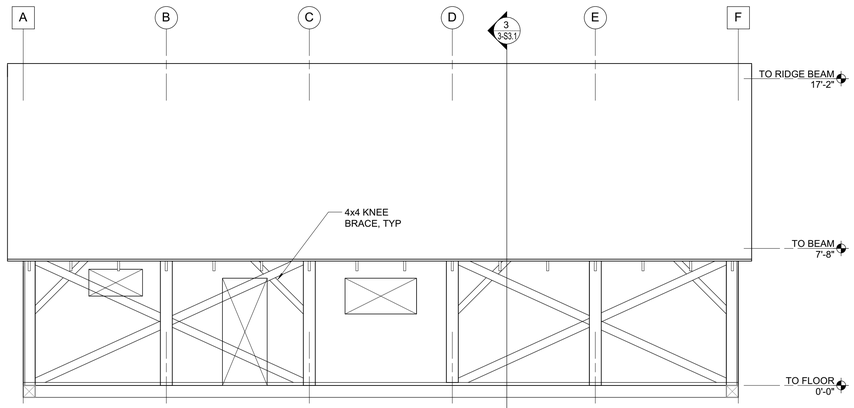
BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION



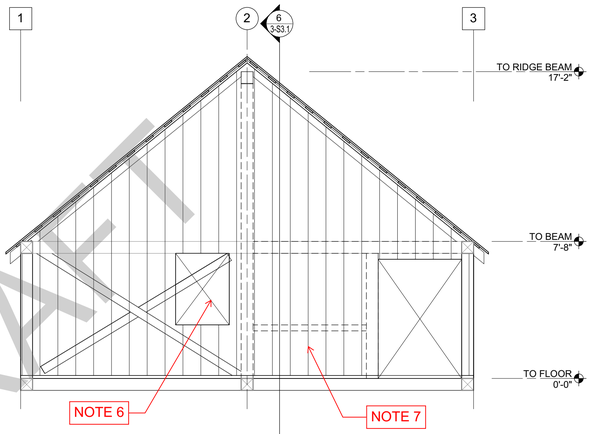
4 NORTH ELEVATION BOD OPTION 2
1/4" = 1'-0"



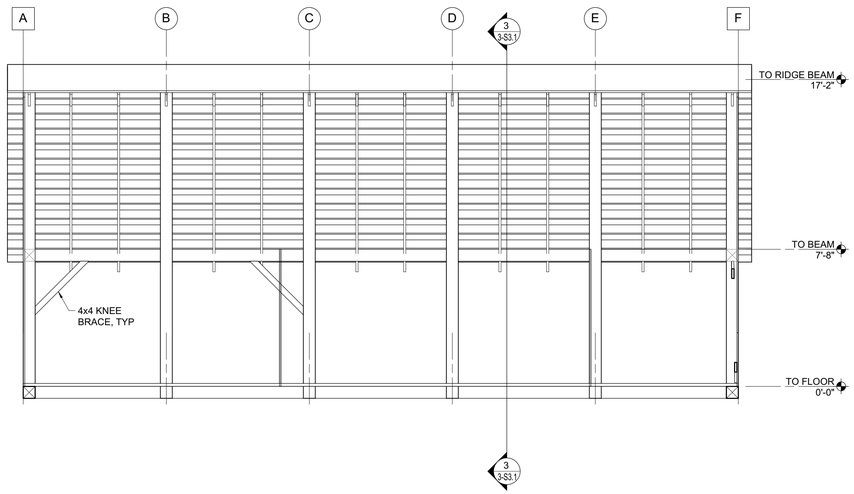
1 EAST ELEVATION BOD OPTION 2
1/4" = 1'-0"



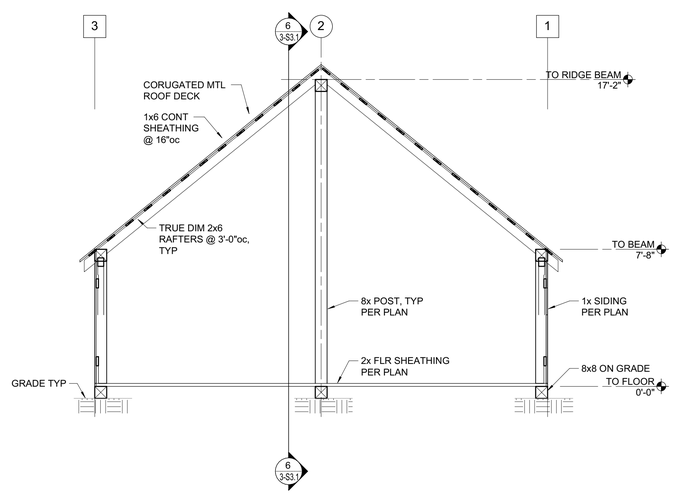
5 SOUTH ELEVATION BOD OPTION 2
1/4" = 1'-0"



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"

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.

PRINT TO 11x17

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

DYER BARN
BOD OPTION 2
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

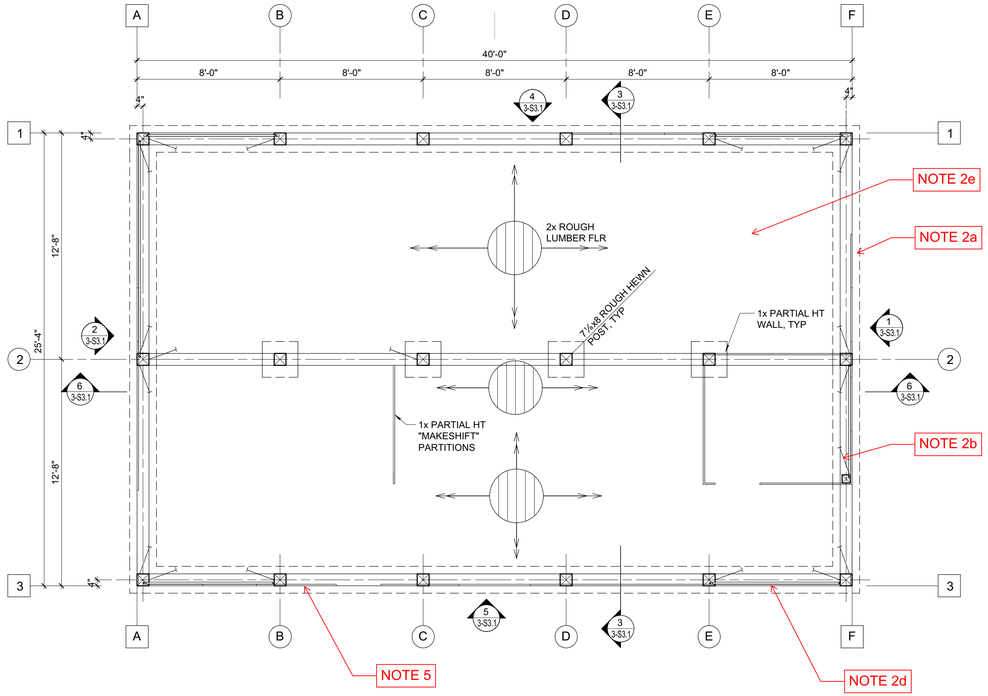
ELEVATIONS & SECTIONS

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

SHEET

2-S3.1

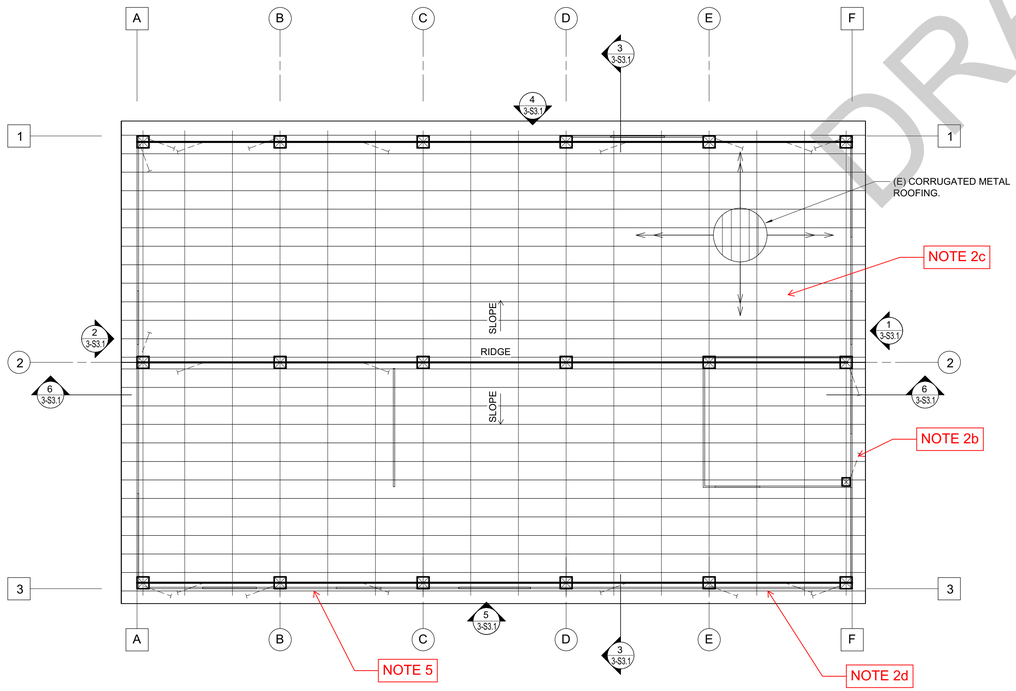
BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION



NORTH

FLOOR PLAN BOD OPTION 3

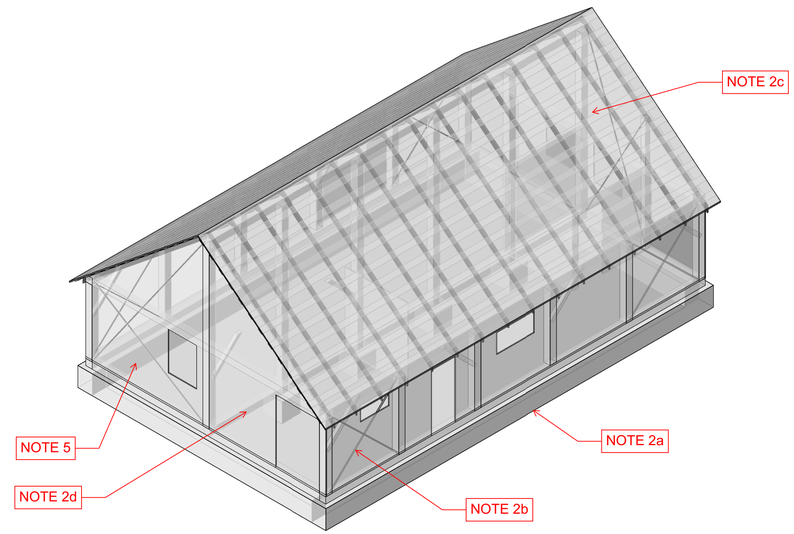
1/4" = 1'-0"



NORTH

ROOF FRAMING PLAN BOD OPTION 3

1/4" = 1'-0"



1 3D ISOMETRIC VIEW

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.

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Attachment 1

Revision Schedule

#	Revision Description	Date

ZFA STRUCTURAL ENGINEERS
1390 el camino real | suite 100
san carlos ca 94070
650.394.8869
zfa.com

PROJECT

DYER BARN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

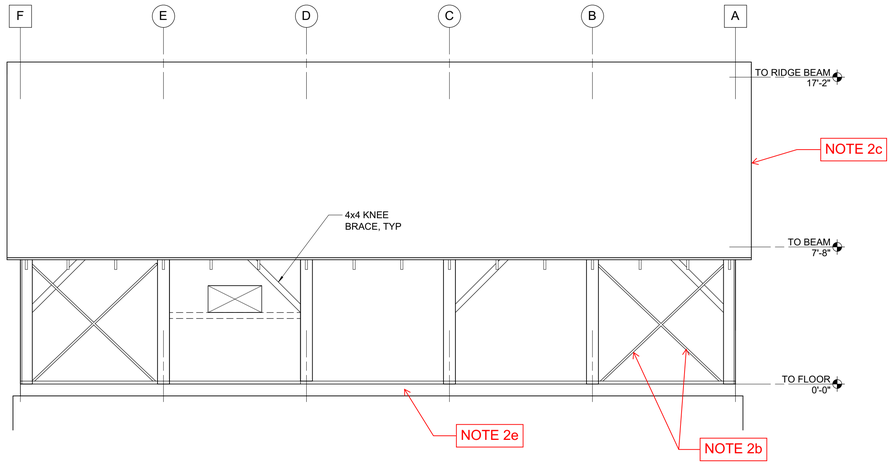
FLOOR AND ROOF FRAMING PLANS

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

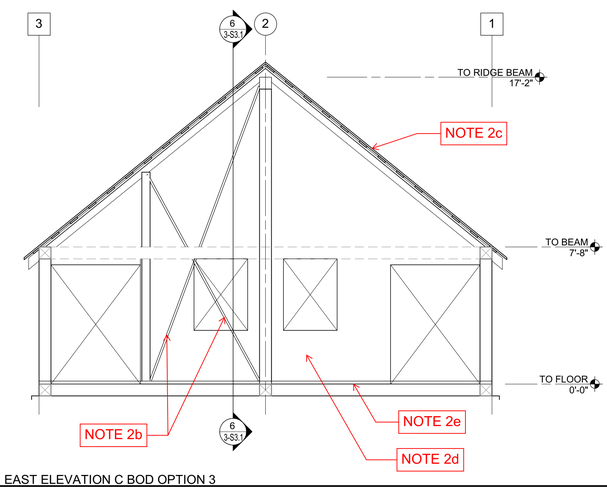
SHEET

3-S2.1

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION



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"

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

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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.

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Revision Schedule

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PROJECT

DYER BARN
BOD OPTION 3
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

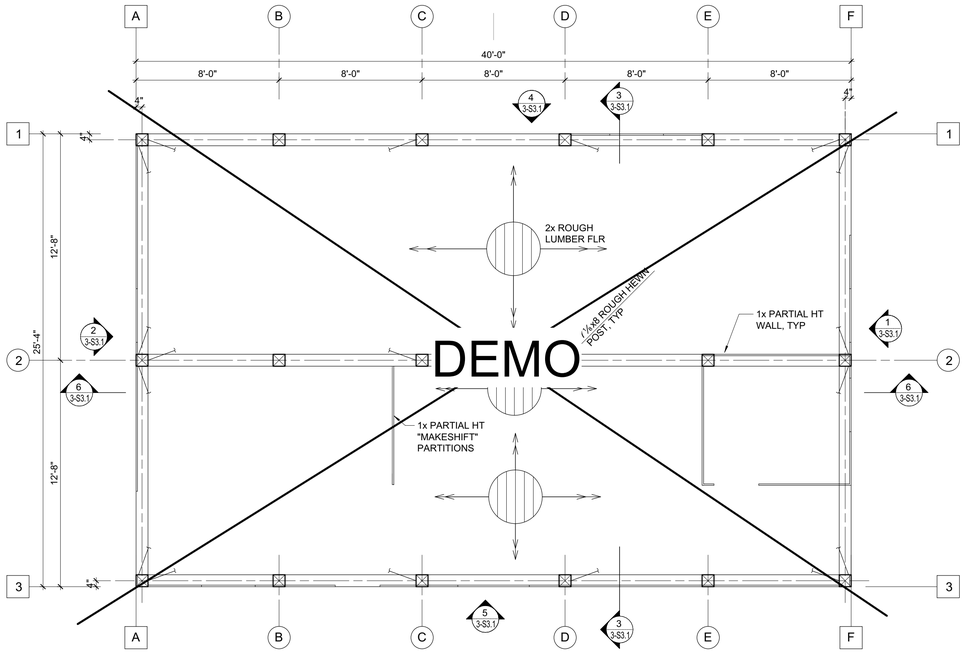
ELEVATIONS & SECTIONS

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

SHEET

3-S3.1

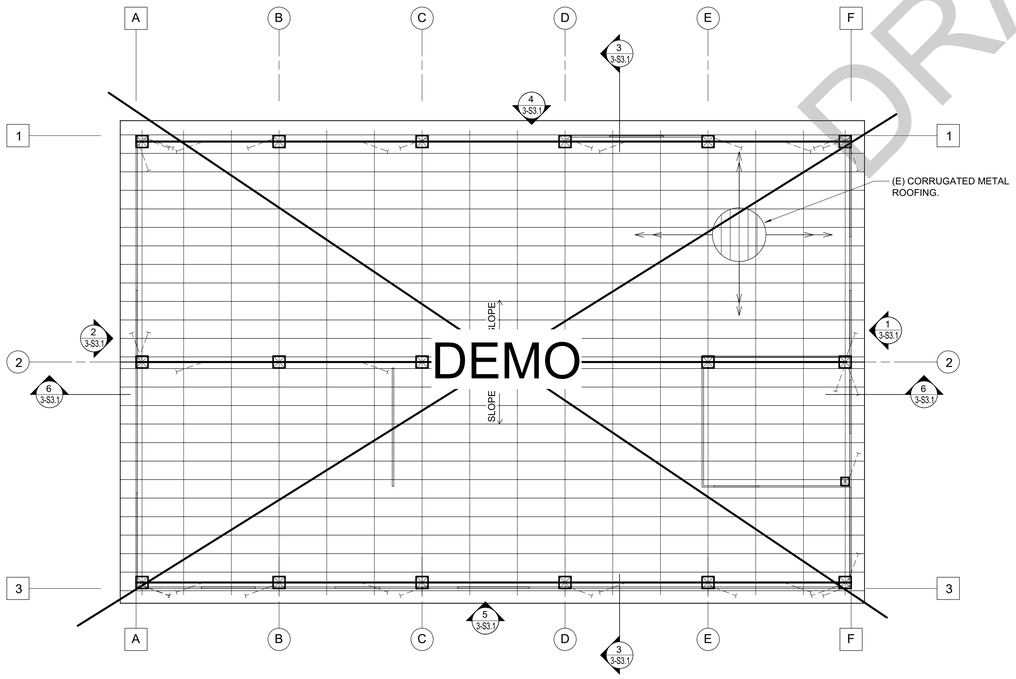
BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION



NORTH

FLOOR PLAN BOD OPTION 4

1/4" = 1'-0"

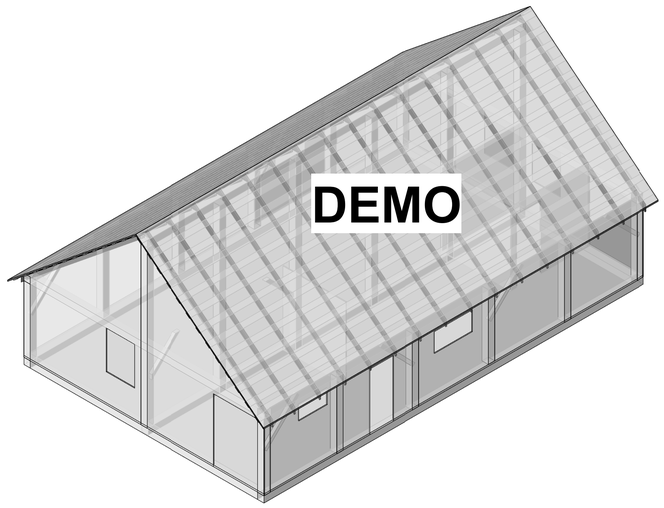


NORTH

ROOF FRAMING PLAN BOD OPTION 4

1/4" = 1'-0"

PRINT TO 11x17



3 3D ISOMETRIC VIEW

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.

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

DYER BARN
BOD OPTION 4
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

FLOOR AND ROOF FRAMING PLANS

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

SHEET

4-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 1:49:51 PM

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.
☐ 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 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)*
☐ 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)*
	No wood diphragms present.
☐ 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	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 1

ROMIG ENGINEERS

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.

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 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.

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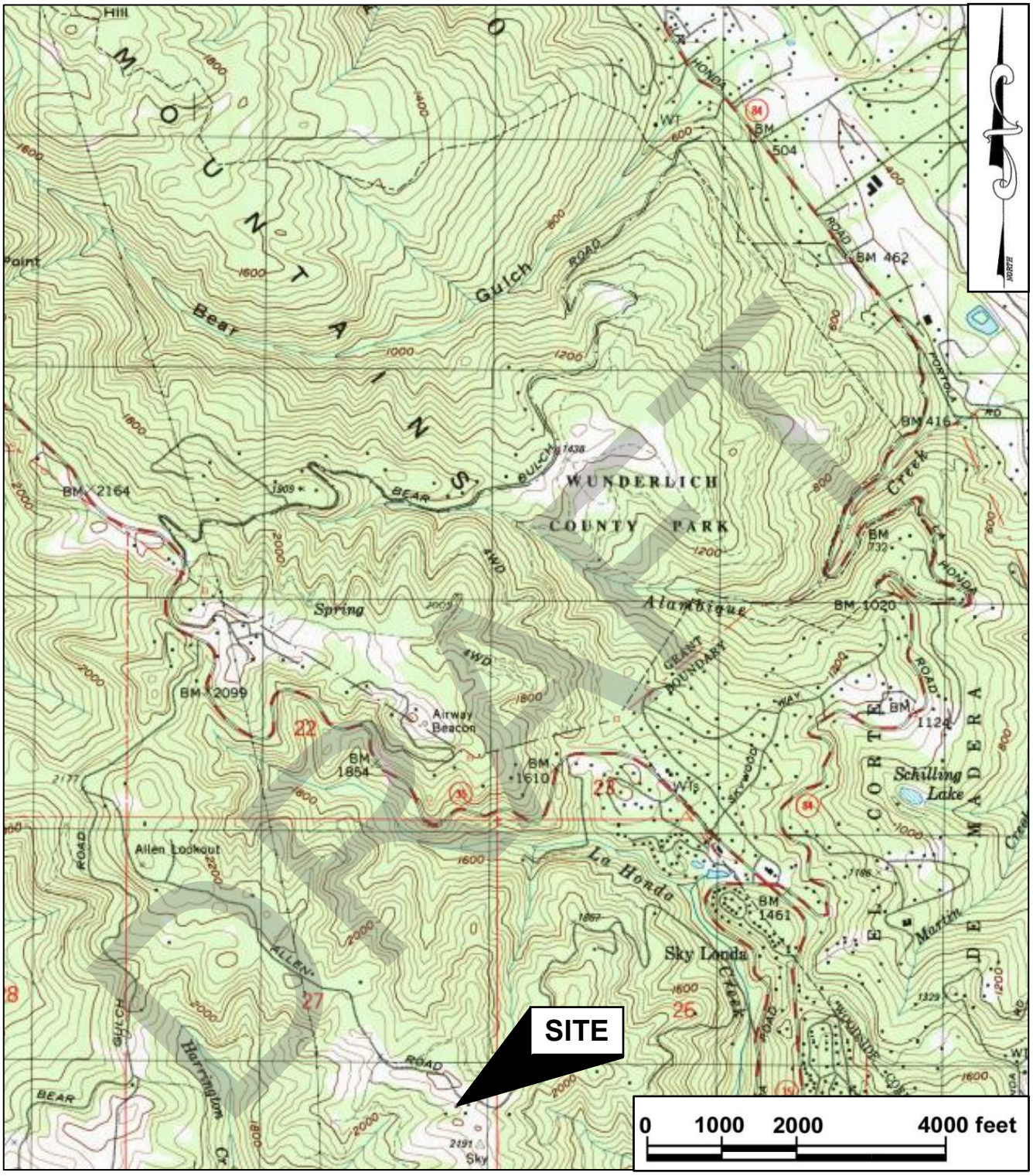

Scale: 1 inch = 2000 feet
Base is United States Geological Survey Palo Alto 7.5 Minute Quadrangle, dated 1997.

VICINITY MAP **FIGURE 1**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

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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

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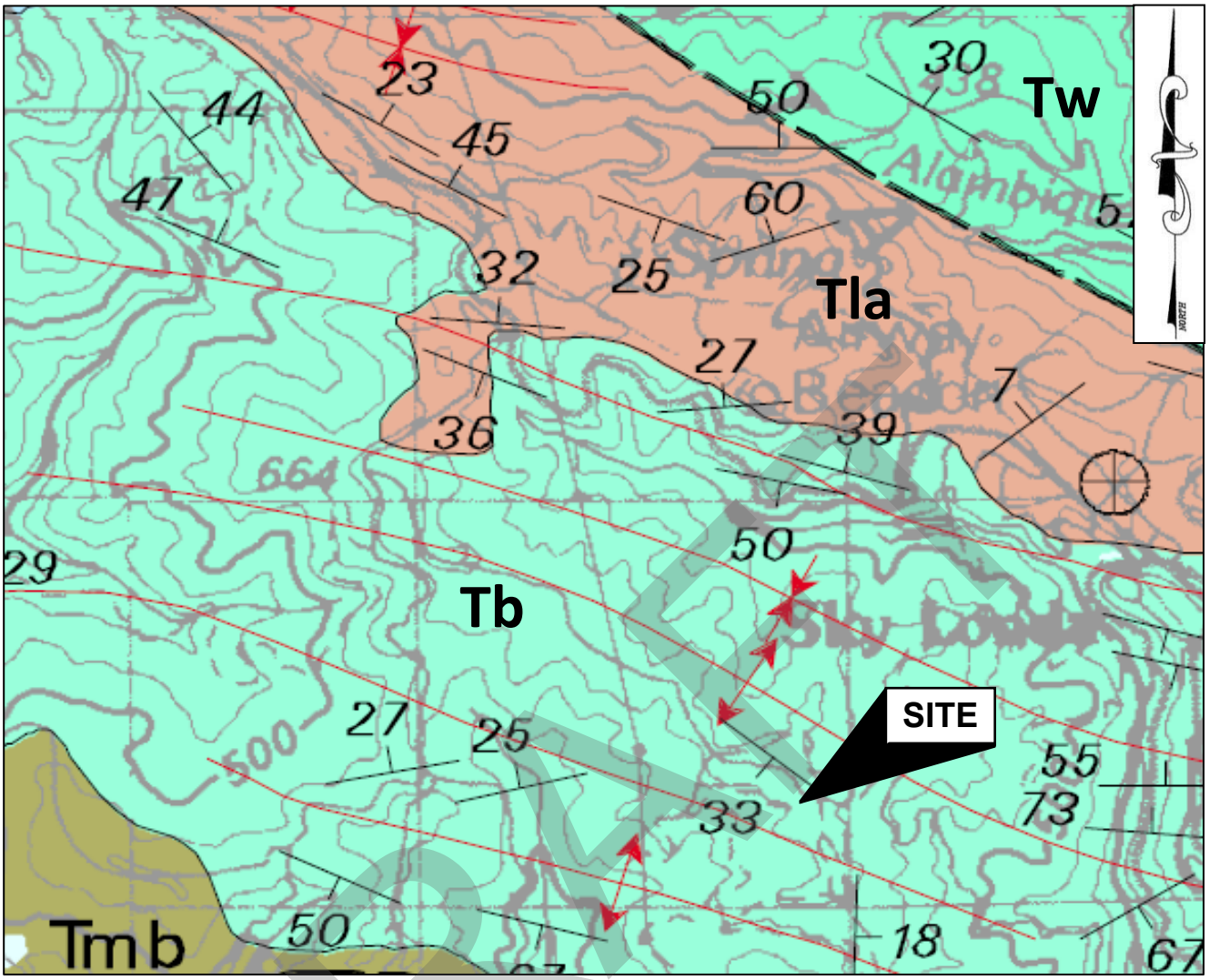

MAP LEGEND

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 **FIGURE 3**

MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

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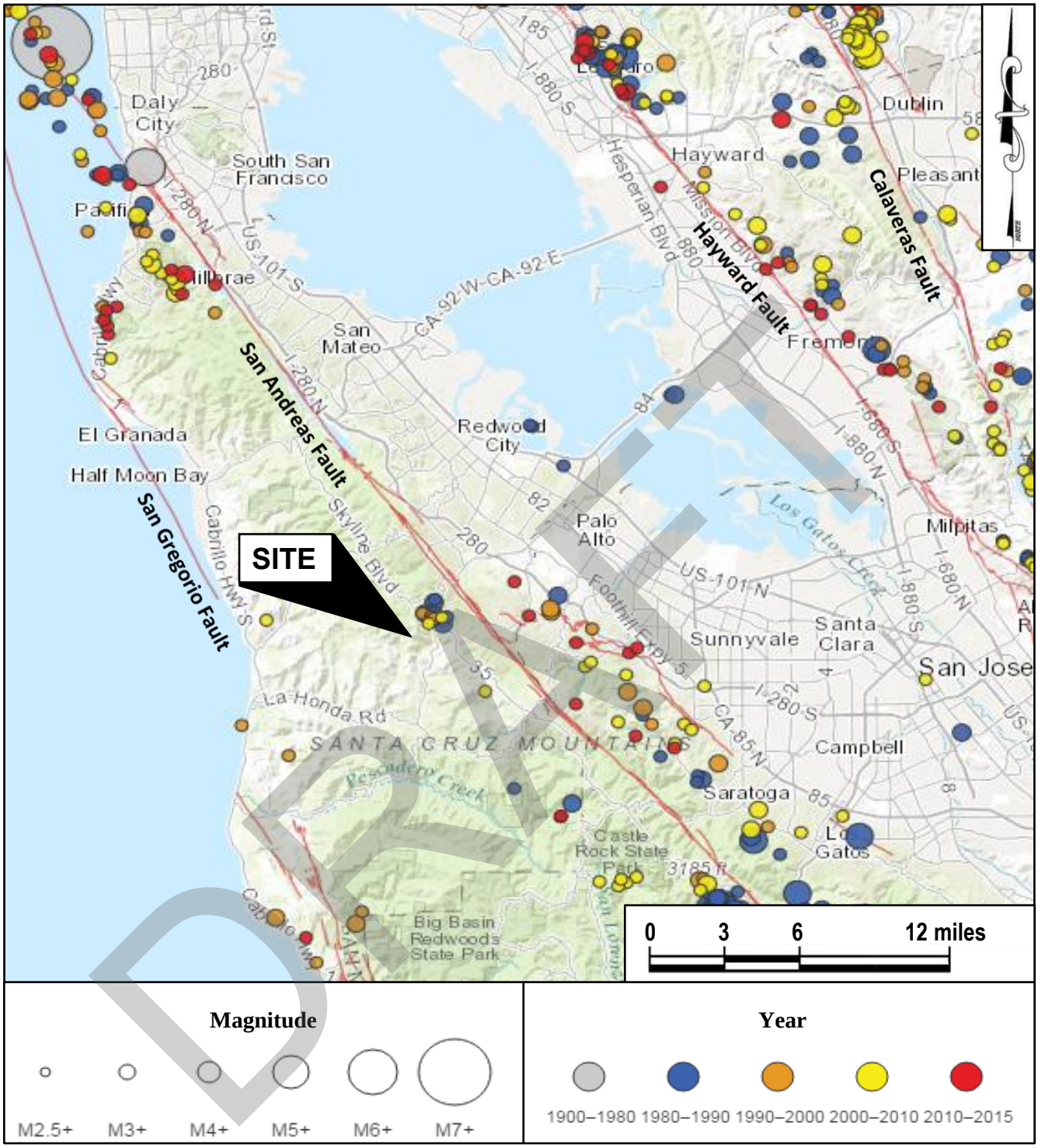

Earthquakes with M5+ from 1900 to 1980, M2.5+ from 1980 to January 2015. Faults with activity in last 15,000 years. Based on data sources from Northern California Earthquake Data Center and USGS Quaternary Fault and Fold Database, accessed May 2015.

REGIONAL FAULT AND SEISMICITY MAP **FIGURE 4**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

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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

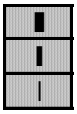
BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
12 "	3"	0.75"		4	10	40	200
SIEVE OPENINGS				U.S. STANDARD SERIES SIEVE			

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

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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 **FIGURE A-2**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA 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.

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

MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA 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)*
Butano Formation: Brown, Sandstone to Siltstone, moist, fine grained, fractured, friable, severely weathered.	Medium	BR		0		16	12		
▲ Free Swell = 13%.						▲ 81 50/5"	20		
				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 **BORING EB-2**

MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019

SAN MATEO COUNTY, CALIFORNIA 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.

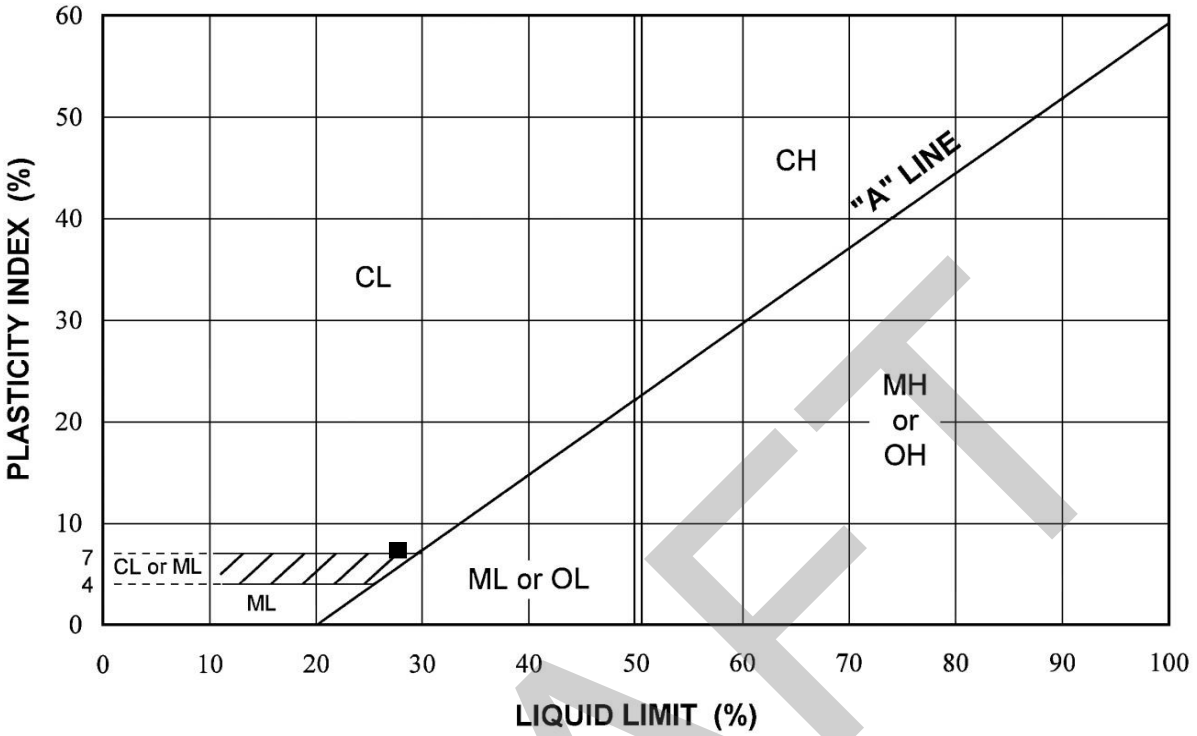

Chart Symbol	Boring Number	Sample Depth (feet)	Water Content (percent)	Liquid Limit (percent)	Plasticity Index (percent)	Liquidity Index (percent)	Passing No. 200 Sieve (percent)	USCS Soil Classification
■	EB-1	2-4	14	28	7	-100		ML

PLASTICITY CHART **FIGURE B-1**
MIDPENINSULA REGIONAL OPEN SPACE WHITE BARN OCTOBER 2019
SAN MATEO COUNTY, CALIFORNIA PROJECT NO. 4907-2

ROMIG ENGINEERS, INC.

1390 El Camino Real, 2nd Floor

San Carlos, California 94070

Phone: (650) 591-5224

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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

Terracon

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:

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

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

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".

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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.
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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.
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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.
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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.
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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.
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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 sgsteiner@terracon.com
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☐ PM – T. Kattchee takattchee@terracon.com
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☐ 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 - 6 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:**		**Date/ Time:**	7/5/19 FedEx 950
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

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 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)

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 ☒ 3-6DAY

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 Yblw**	
Sample ID	Sample Location & Material Location	Quantity:
8A	Interior	
8B	"	
8C	"	

Relinquished By:	M.HARRINGTON	**Signature:**	M/H	**Date/Time:**	07-3-19
Received By:		**Signature:**		**Date/ Time:**	7/5/19 Edex 9S
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	


002198987

Attachment 1

Terracon

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☒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 – wirins – Black Yarn	
Sample ID	Sample Location & Material Location	Quantity:
9A	cabin	
9B	1	
9C	1	

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:**		**Date/ Time:**	7/5/19 FedEx 95
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.

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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".

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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".

Attachment 1

Terracon

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	☐PM – T. Kattchee takattchee@terracon.com	
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☐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 18 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:**		**Date/ Time:**	7/5/19 Fedex 900
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:

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

Renee Luna-Trepczynski

Approved Signatory
Renee Luna-Trepczynski

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.

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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.
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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.
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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.
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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.
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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.
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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.
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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.
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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.
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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.
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EMLab P&K
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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.
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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

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☐ PM – K. Pilgrim kmpilgrim@terracon.com
☐ PM – T. Kallchee takallchee@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 -5 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 Floovins Dark Gray flower pat	
Sample ID	Sample Location & Material Location	Quantity: 320 S.F
203A	Bedroom -1 -	16X20
203B	-	
203C	-	

Relinquished By:	M.HARRINGTON	Signature:	MH	Date/Time:	07-3-19
Received By:		Signature:		Date/ Time:	7/5/19 FedEx 950
Relinquished By:		Signature:		Date/Time:	
Received By:		Signature:		Date/Time:	

Attachment 1

002198988

Terracon

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☐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)

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: _____ Date/ Time: 7/5/19 Rcd @ 950
Relinquished By: _____ Signature: _____ Date/Time: _____
Received By: _____ Signature: _____ Date/Time: _____

Attachment 1

002198988

Terracon

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☐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 Cheme Yellow mastic	
Sample ID	Sample Location & Material Location	Quantity: 200 S.F
206A	Kitchen – west	14X14
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	Kitcher – West	14X14
208 B	" – center	
208 C	" – East	

Relinquished By:	M.HARRINGTON	**Signature:**	MH	**Date/Time:**	07-3-19
Received By:		**Signature:**		**Date/ Time:**	7/5/19 Rel 6x950
Relinquished By:		**Signature:**		**Date/Time:**	
Received By:		**Signature:**		**Date/Time:**	

Attachment 1

002198988

Terracon

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☐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 -6 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:** _____ **Date/ Time:** 7/5/19 Fedex 9a
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	

Lead Chain-of-Custody Form

EHS Laboratories™

Environmental Hazards Services, LLC

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

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

2 7/9/19

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	= 1st FL	BA	= Bath	BR	= Bedroom	FL	= Floor	SL	= Window Sill
Paint Chip	= PC	Soil	= S	LR	= Living Room	R	= Rear	2	= 2nd FL	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-1 % by Weight Per-			kara 7/9/19 R
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

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 apsteiner@terracon.com	☐ PM – K. Schroeter kpschroeter@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

[X] Flame AA (EPA 7420) [ ] TTLC

PAGE 1 OF 1

☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Prieszell wwprieszelj@terracon.com	☐ PM – T. Katchee tskatchee@terracon.com	☐ PM – D. Block david.block@terracon.com

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 9:50
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 COUSTODY

14468

(J3 Internal 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 #:** 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)*

Attachment 1

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:

002199099

Terracon

E-MAIL REPORT TO: PROJECT MANAGER (PM)

☐ denise.waller@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 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 ☐ Acrobiology ☐ Quanterra (Other) EmLab

TAT ☐ Rush ☐ 24HRS ☐ 48HRS ☐ 3-5 Day

Sample ID	Paint Description and Sample Location	Condition (L/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:** **Date/ Time:** 7/5/19 Rec'd 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:

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.

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

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:	[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)*

Attachment 1

IH CHAIN OF CUSTODY

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:

J3 Resources, Inc. ♦ 6110 West 34th Street ♦ Houston, Texas 77092 ♦ tel: 713/290-0221 ♦ fax: 713/290-0248

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. Friaszell wmfriaszell@terracon.com	☐ PM – T. Kaltchee tskaltchee@terracon.com	☐ PM – D. Block david.block@terracon.com

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

☒ 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) EMLab

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 900

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 krschroeter@terracon.com	
☐ PM – K. Pilgrim kmpilgrim@terracon.com	☒ PM- M. Benefield msbenefield@terracon.com	☐ PM – W. Frieszel wmfrieszel@terracon.com
☐ PM – T. Kattchee takattchee@terracon.com	☐ PM – D. Block david.block@terracon.com	

LEAD PAINT SAMPLE DATA SHEET

* Lead Analysis

X Flame AA (EPA 7420) _____ TTLC

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 # 14 windows Unit # 4X5 Room Ext 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:** **Date/ Time:** 7/5/19 FedEx 950

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.

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

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

State of California
Division of Occupational Safety and Health
Certified Asbestos Consultant

Name: **Michael S Benefield**

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

Attachment 1

APPENDIX F

PHOTOGRAPHS

Photo 1 La Honda Log Cabin

Photo 2 La Honda White Barn

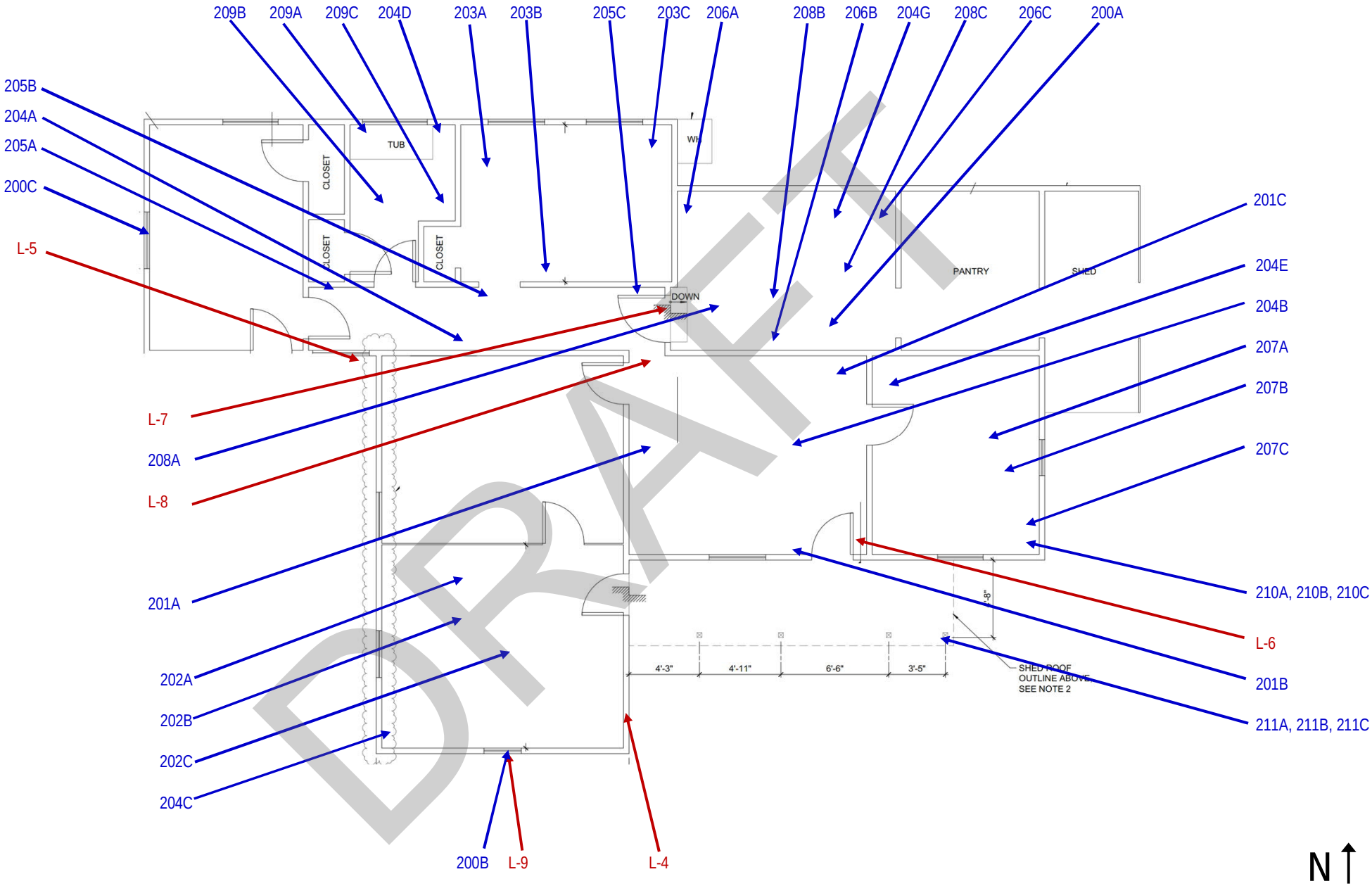
Photo 3 Beatty House

Photo 4 Material 204 - ACM joint Compound on wallboard walls and ceilings in the Beatty House

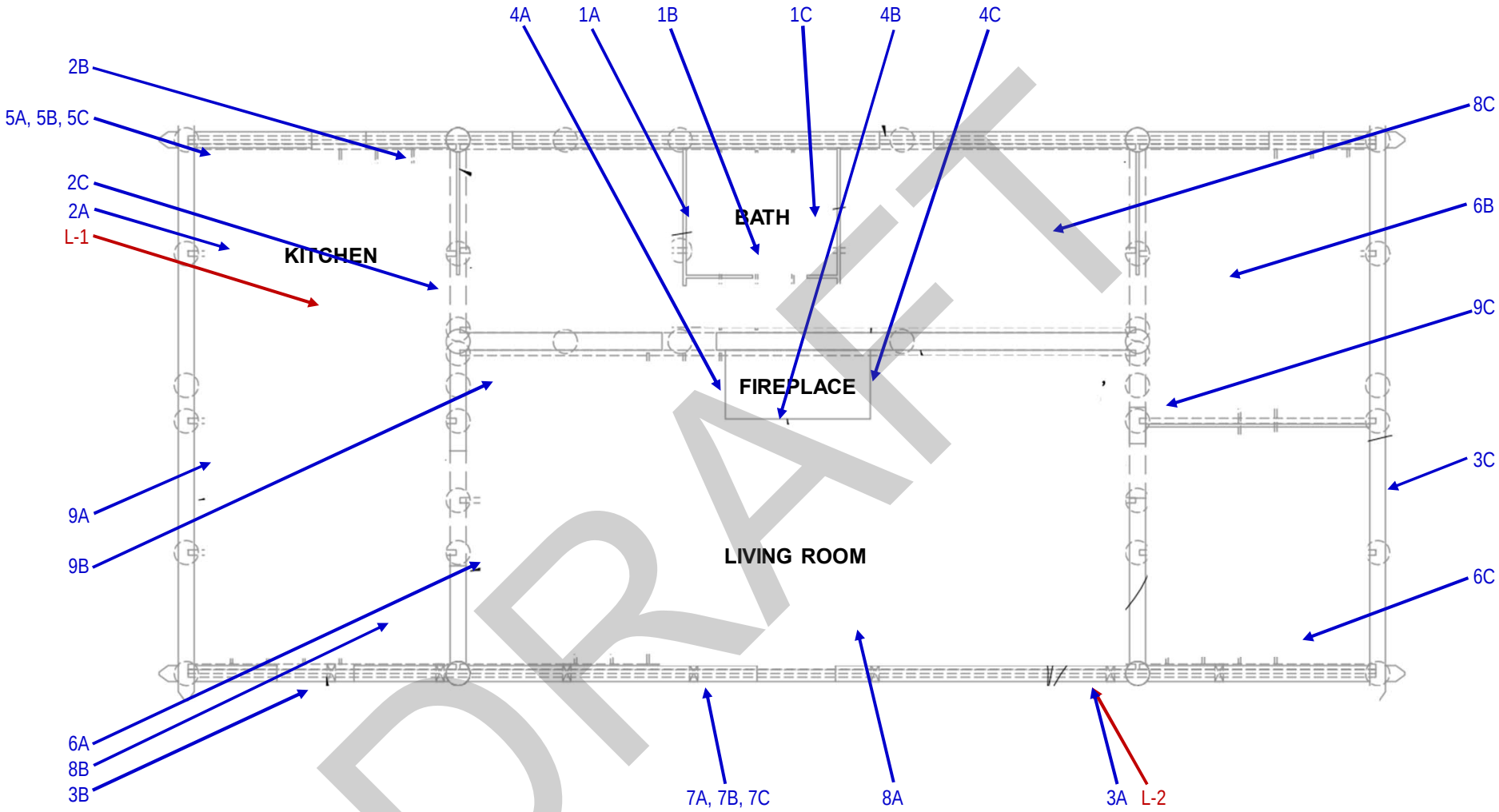
Photo 5 Material 201 ACM vinyl sheet flooring in the Beatty House

APPENDIX G

SAMPLE LOCATION DRAWINGS



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.

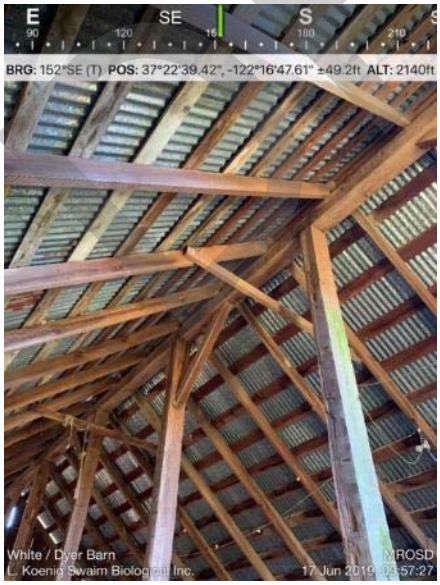


Photo 7. Corrugated roof slats and rafters provide suitable bat roosting habitat.

Photo 8. Bat guano present on the floor.

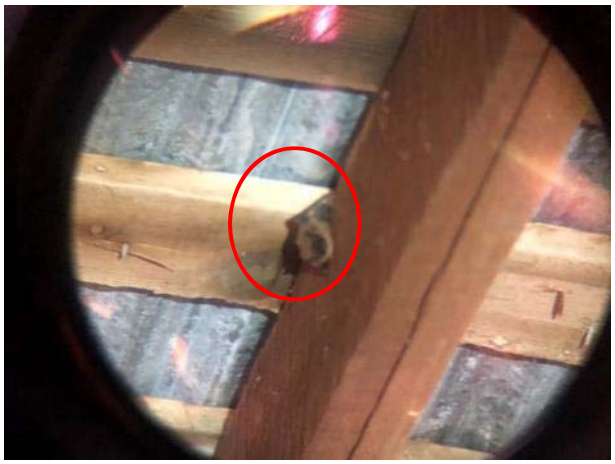


Photo 9. *Myotis sp.* (circled in red) observed roosting in rafters.

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.

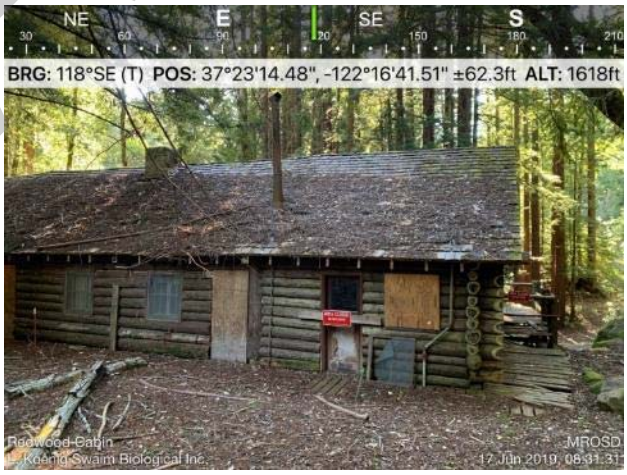


Photo 14. Redwood cabin.

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 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

PROJECT NORTH

0 50'

SCALE - FEET

1 Inch = 15 Feet

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

Revision Schedule

#	Revision Description	Date

1390 el camino real | suite 100
san carlos ca 94070
zfa job no. 19235

zfa.com
650.394.8869

Sigma Prime Geosciences, Inc.
SIGMA PRIME GEOSCIENCES, INC.
332 PRINCETON AVENUE
HALF MOON BAY, CA 94019
(650) 726-3590
sigmaprm@gmail.com

PROJECT

DYER BARN
LA HONDA CREEK OPEN SPACE PRESERVE
APN 075 330 220

SHEET DESCRIPTION

TOPOGRAPHIC SITE PLAN

ENGR: AZG	DATE: SEPT 30, 2019
PM: SRP	

SHEET

C1.0

BASIS OF DESIGN DOCUMENT - NOT FOR CONSTRUCTION

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

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

OCMI JOB #: 19414.000 | 18 December 2019

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 (Assume 33% is flaking and failing)	412	SF	25.00	$10,295
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

OCMI JOB #: 19414.000 | 18 December 2019

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

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 Exterior site, trees and shrubs Check exterior and interior and clean, fix as needed	480	MnDay	600.00	$288,000

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

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 (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) (Assume 12 logs per post and 24 fixings)	30	EA	495.00	$14,850
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

OCMI JOB #: 19414.000 | 18 December 2019

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

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:				
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

OCMI JOB #: 19414.000 | 18 December 2019

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

OCMI JOB #: 19414.000 | 18 December 2019

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

OCMI JOB #: 19414.000 | 18 December 2019

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**