

FINDING OF EFFECT

Sam and Alfreda Maloof Compound Roof Replacement
(Main House, Workshop 1, Workshop 2, and Guest House)
Alta Loma, Rancho Cucamonga, San Bernadino County, California



Prepared for:
Sam and Alfreda Maloof Foundation for Arts and Crafts
5131 Carnelian Street
Alta Loma, California 91701

Prepared by:



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June 30, 2023

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I. INTRODUCTION AND EXECUTIVE SUMMARY

The purpose of this Finding of Effect report (report) is to determine whether or not the proposed undertaking at the Sam and Alfreda Maloof Compound located at 5131 Carnelian Street, Alta Loma, California (Assessor Parcel Number: 106-128-129, subject property or Compound) will have any adverse effect on the historic property under Section 106 of the National Historic Preservation Act of 1966, as amended (Section 106). The Compound is owned by the Sam and Alfreda Maloof Foundation for Arts and Crafts (SAMFAC or Foundation), which is proposing roof repair and replacements (undertaking or proposed project) that include the four roofs on the Main House, Workshop 1, Workshop 2, and Guest House (Visitor Center or Gift Shop).

The proposed undertaking is funded in part by a Save America's Treasures (SAT) grant that was awarded to SAMFAC. Through the Historic Preservation Fund, as administered by the National Park Service (NPS), the SAT grant will finance, in part, the proposed project. Any undertaking using federal funding must comply with Section 106 regulations. Typically, a Determination of Eligibility (DOE) must first be completed to identify if any historic properties may be affected by the proposed undertaking. Chattel prepared the Sam and Alfreda Maloof Compound National Register of Historic Places (National Register) nomination for the property, which was listed in 2010; the listing serves as identification of a historic property or DOE under Section 106. This report evaluates the proposed undertaking in relation to its Area of Potential Effects (APE) for conformance with the *Secretary of the Interior's Standard for the Treatment of Historic Properties (Secretary's Standards)* to complete a Finding of Effect (FOE). The APE is the approximately 5.5-acre National Register-listed property. Chattel previously prepared a Historic Structure Report (HSR) dated September 6, 2019, providing documentary, graphic, and physical information about property history. Drawings of the proposed project were prepared by Wiss, Janney, Elstner Associates, Inc. (WJE). For the reasons presented in this report, the proposed undertaking is found to conform with the *Secretary's Standards* and has no adverse effect under Section 106 and is thus also eligible for categorical exclusion under the National Environmental Policy Act (NEPA).

Refer to Attachment A for historic images, Attachment B for contemporary photos, Attachment C for Maloof roof table, Attachment D for maps of the subject property, and Attachment E for WJE roof replacement memorandum.

II. QUALIFICATIONS

Chattel, Inc. (Chattel) is a full-service historic preservation-consulting firm with practice throughout the western United States. The firm represents governmental agencies and private ventures, successfully balancing project goals with a myriad of historic preservation regulations without sacrificing principles on either side. Comprised of professionals meeting the *Secretary of the Interior's Professional Qualifications Standards* in history, architecture, architectural history, and historic architecture, the firm offers professional services including historical resources evaluation and project effects analysis, in addition to consultation on federal, state, and local historic preservation statutes and regulations.

Chattel staff engage in a collaborative process and work together as a team on individual projects. This evaluation was prepared by firm President, architectural historian and preservation architect, Robert Jay Chattel and Associate I Hannah Phillips, historian. Additional support was provided by Associate III Alvin-Christian Nuval, planner.

III. METHODOLOGY

Chattel engaged in collaborative efforts with WJE and members of the Foundation to develop the proposed undertaking while being mindful of required conformance with the *Secretary's Standards*. The following describes key elements of this process:

Site Visit

On October 26, 2022, Chattel, Inc. President Robert Jay Chattel, architectural historian and preservation architect, and Associate I Hannah Phillips, historian conducted a site visit to the Compound during which the exterior and interior of the property were extensively photographed, and integrity was assessed.

Design Collaboration

WJE previously performed a building envelope waterproofing survey and authored a report dated August 3, 2018, documenting the observed conditions of the roofs as well as providing prioritized repair recommendations and an estimate of probable costs. WJE also provided a memo regarding roof design considerations and options dated August 12, 2022. Chattel collaborated with WJE on the design for the roof repair and replacement drawings dated June 26, 2023 and provided a review of the documents in regard to conformance with the *Secretary's Standards*.

IV. REGULATORY SETTING

National Register of Historic Places

The National Register is the nation's official list of historic and cultural resources worthy of preservation. Authorized under the National Historic Preservation Act of 1966, as amended, the National Register is part of a federal program to coordinate and support public and private efforts to identify, evaluate, and protect the country's historic and archaeological resources. Properties listed in the National Register include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. The National Register is administered by the National Park Service (NPS), which is part of the United States Department of the Interior.

Resources are eligible for National Register listing if they:

- A. are associated with events that have made a significant contribution to the broad patterns of our history; or
- B. are associated with the lives of significant persons in our past; or
- C. 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 and distinguishable entity whose components may lack individual distinction; or
- D. have yielded or may be likely to yield, information important in history or prehistory.¹

Once a resource has been determined to satisfy one of the above-referenced criteria, then it must be assessed for integrity. Integrity refers to the ability of a property to convey its significance, and the degree to which the property retains the identity, including physical and visual attributes, for which it is significant under the four basic criteria listed above. The National Register recognizes seven aspects or qualities of integrity: location, design, setting, materials, workmanship, feeling, and association. To retain its historic integrity, a property must possess several, and usually most, of these aspects.

The National Register includes only those properties that retain sufficient integrity to accurately convey their physical and visual appearance from their identified period of significance. Period of significance describes the period during which a property's importance is established. It can refer simply to the date of construction, or it can span multiple years, depending on the reason the property is important. The period of significance is established based on the property's relevant historic context and as supported by facts contained in the historic context statement.

Evaluation of integrity is founded on "an understanding of a property's physical features and how they relate to its significance."² A property significant under Criterion A or B may still retain sufficient integrity to convey its significance even if it retains a low degree of integrity of design, materials or workmanship. Conversely, a property that derives its significance exclusively for its architecture under Criterion C must retain a high degree of integrity of design, materials, and workmanship. For some properties, comparison with similar properties is considered during the evaluation of integrity, especially when a property type is particularly rare. While integrity is important in evaluating and determining significance, a property's physical condition, whether it is in a deteriorated or pristine state, has relatively little influence on its significance. A property that

¹ National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation* (National Park Service, 1990, revised 2002).

² Ibid.

is in good condition may lack the requisite level of integrity to convey its significance due to alterations or other factors. Likewise, a property in extremely poor condition may still retain substantial integrity from its period of significance and clearly convey its significance.

National Historic Preservation Act, Section 106

National Historic Preservation Act, Section 106 (Section 106) requires Federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (Council) a reasonable opportunity to comment. Section 106 regulations are described in 36 CFR Part 800 *Protection of Historic Properties*.

As defined by 36 CFR 800:

Undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency.

Historic property means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior.

In order to comply with Section 106, an undertaking must first be found to be a type that might affect historic properties. This includes determining the scope of efforts, identifying historic properties, evaluating historic significance and effects, and consulting with that State Historic Preservation Officer (SHPO), or Tribal Historic Preservation Officer (THPO) if a Native American tribe has assumed the functions of the SHPO. If historic properties are identified and affected by an undertaking, then the adverse effects are assessed.

An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish integrity (36 CFR 800.5(a)(1)). Restoration, rehabilitation, repair, and maintenance should be consistent with the *Secretary's Standards for the Treatment of Historic Properties* (*Secretary's Standards*, 36 CFR 68). If the proposed undertaking conforms with the *Secretary's Standards*, it has no adverse effect (36 CFR 800.5(b)). If no adverse effect is found, the agency official, in consultation with the SHPO/THPO, can propose a finding of no adverse effect and provide documentation. The SHPO/THPO has 30 days within receipt of documentation to review the finding.

If an adverse effect is found, the agency official shall consult with the SHPO/THPO to develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize, or mitigate adverse effects on historic properties. If adverse effects are able to be resolved, then the project moves forward with a memorandum of agreement that is evidence of the Federal agency's compliance with Section 106. The agency is obligated to follow the terms of the memorandum of agreement.

Secretary of the Interior's Standards for the Treatment of Historic Properties

The *Secretary's Standards* are not intended to be prescriptive and are intended to be flexible and adaptable to specific project conditions to balance continuity and change while retaining historic building fabric to the maximum extent feasible. Their interpretation requires exercise of professional judgment and balance of the various opportunities and constraints of any given project based on use, materials retention and treatment, and compatibility of new construction. Not every standard necessarily applies to every aspect of a project, nor is it necessary to comply with every standard to achieve conformance. The *Secretary's Standards* encompass four approaches to treatments for historic properties: preservation, rehabilitation, restoration, and reconstruction. The appropriate treatment for the proposed project is rehabilitation.

The Rehabilitation Standards are as follows:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall 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 architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features will be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction will not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
10. New additions and adjacent or related new construction shall 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.

V. DESCRIPTION

The Sam and Alfreda Maloof Compound (Compound) is located on approximately 5.5 acres in the Alta Loma area of Rancho Cucamonga,³ California. The site is bounded by Almond Street to the north, Sunstone Avenue to the east, Hidden Farm Road to the south, and Carnelian Street to the west. The Compound consists of nine resources total, including three contributing buildings, five non-contributing buildings and one non-contributing site (see table below). The proposed undertaking concerns preservation and repair of four roofs on the Main House, Workshop 1, Workshop 2, and Guest House. The APE is the National Register-listed property.

Building/Site	Eligibility Status
Main House	Contributing
Workshop 1	Contributing
Guesthouse	Contributing
New House	Non-contributing
Workshop 2	Non-contributing
Wood Storage A and B	Non-contributing
Wood Storage Y and Z	Non-contributing
Hanna Archival Conservatory and Jacob Education Center	Non-contributing
Sam Maloof (1916-2009) and Alfreda Ward Maloof (1911-1998) Gravesite	Non-contributing (site)

Physical Description

The following physical description is extracted from the Historic American Building Survey (HABS) based on review of historic documentation and inspection. Refer to Attachment A for historic images, Attachment B for contemporary photos, Attachment C for Maloof Roof Table, Attachment D for maps of the subject property, Attachment E for WJE roof replacement memorandum.

The HABS written narrative describes the contributing features roofs and the one noncontributing feature roof as:

³ Alta Loma is one of three small towns (Alta Loma, Etiwanda and Cucamonga) incorporated in 1977 as the City of Rancho Cucamonga. According to Erwin G. Gudde's, *California Place Names: The Origin and Etymology of Current Geographical Names*, *alta* is "the Spanish adjective for 'high' or 'upper' ..." and *loma* is a "geographical term which "designates a low, long elevation or hill...occasionally applied to higher hills or mountains." (Gudde 181) The name Alta Loma "was applied in 1912 to a station on the line of the Pacific Electric Railway Company...." (Gudde 8).

Main House

The house exhibits the broadest range of roof heights, exterior finishes and details among all the buildings on the site. The original portion contains the kitchen and dining area and the earlier additions extend to the east where they meet a three-story tower that along with admitting light into the lower level marks the shift in alignment from east-west to north-south.

The easterly portion of this elevation is the ... wood storage building attached to the guest bedroom. The main portion of the wood storage building attached to the guest bedroom, is covered by a low-pitched shed with another, lower shed-roofed extension to the east. Both roofs have V-notched metal roofing. From the north view, as with all the elevations, the results of Maloof's [more than 40] years of building are evident—pyramidal hip roofed towers and shed and gable-roofed second story additions peek up from their locations.

From the courtyard, the main entrance is reached by going under an open trellis and then the protruding bay of the house's second story, which is supported by a cluster of wrapped 4" x 4" posts. This upper story is covered with vertical, 12" boards, except for the protruding bay, which is sided with untreated wood shingles. Beyond this bay, a square, pyramidal-hip roofed tower protrudes. Covered in untreated wood shingles, its roof is sheathed in asphalt tiles. To the west of the courtyard entrance is the flat and shed-roof living room, now an office, converted from the original 1956 carport. Perhaps more than the others, this elevation reveals most fully the interplay of rooflines and roof types, rhythm, and movement that Sam Maloof created in [more than 40] years of building. Most of the dozen-plus additions to the original 1956 house can be seen or at least glimpsed from this perspective.

A portion of the guest bedroom is covered by a story-and-a-half high addition into which a wood-framed, horizontal aluminum-sliding window brings light. A small, shed-roof portion is located below the above portion, and both are covered with metal, V-notched roofing, painted azure blue. This elevation affords a clear view of the hip pyramidal tower above the bathroom of the guest bedroom. Covered with asphalt shingles, the tower roof has overhanging eaves that shade the long, single-paned windows on all four sides of the tower.

The 1983-1984 connecting bridge between the guest bedroom and Alfreda's studio/staircase room is covered by a low-pitched gable roof with the same blue, V-notched metal roofing used in other additions. A shed roof that gently rises to the south and is sheathed in the same notched metal roofing covers the 1974 two-story studio/staircase room. This room connects to the 1966 master bedroom addition, and the square, pyramidal-roof, untreated wood shingle covered tower, forms an important part of this elevation. The main elevation of the tree house room features a large, window wall, with divided lights directly below two triangular lights tucked under and following the lines of the front-facing gable roof. The second story shows the long side of the shed roofline, which is covered by the blue, metal rolled roofing used elsewhere on the site.

Workshop 1

The core of... [Workshop 1] is the original 1954 space to which Maloof built four additions, creating the interplay of a variety of roof heights and building movement that characterizes the site's built environment. The space between this building and its northerly neighbor [Workshop 2] is partially covered with an open beam flat roof, creating a breezeway and linking the horizontal lines of each set of buildings. Originally a rectangular, shed roof

building with metal frame, multi-paned horizontal windows, the workshop had two main shed roof additions and then a tall, narrow, gable roof addition was constructed on the east elevation. This addition is denoted by exposed rafters, the tails of which have been rounded, and a wood door of the same vertical planks, helping it blend into the siding. This gable-roof addition is visually linked to [Workshop 1] by a beam that comes out from the rooflines and connects midway up the south elevation of this tall addition (at the same height the breezeway roof does on the north elevation). Vertically laid, overlapped 1" x 12" redwood siding covers the entire exterior and rolled asphalt roofing material covers the roof of all but the original workshop which is of 1" x 5" V-groove wood roof decking.

Workshop 2

Workshop 2 is a reconstruction of the original donor site workshop, utilizing salvaged and reinstalled siding. Single story with board-on-board siding, it is configured in the same plan as the original workshop: a rectangle with a small, narrow, shed-roofed extension to the north. It features an asphalt shingle roof with overhanging exposed eaves and rounded rafter tails. The breezeway that connects Workshop 1 and Workshop 2 was widened by a couple of feet after reconstruction to facilitate access of large equipment.

Guesthouse

[The 1961 Guesthouse's] style is reminiscent of the later phases of the International Style but is mostly Maloof. This flat-roofed structure, [is] accentuated with a hip pyramid roof tower placed just off center. The guesthouse's most distinguishing architectural characteristic is the covered deck that wraps all four sides of the square building. The deck is supported by 4" x 4" posts that rest on footings consisting of natural rocks. The evenly spaced posts rise up to meet exposed rafters that extend from under the flat roof with tails that are gently curved. The roofing material of the flat-roofed portion is built-up tar/asphalt and asphalt composition shingles cover the tower's roof. A carved finial rises from the peak of the tower roof.⁴

Summary of Subject Property History

Sam Maloof (1916-2009) was one of America's most celebrated craftsmen woodworkers and an instrumental contributor to the American Arts and Crafts Movement. Sam began producing hand-crafted furniture from his home studio in Ontario, California, beginning in 1948, and his business and reputation continued to grow, with the assistance of his wife, Alfreda. In 1953, the couple purchased and moved to a property in Rancho Cucamonga (donor site). Each of the buildings constructed at the donor site was constructed by Sam, beginning in 1956. Sam continuously worked on the refining aspects of each of the buildings until the property was relocated in 2000.

During the 1990s, the California Department of Transportation (Caltrans) was planning the extension State Route 30 (210 Freeway), which would run through the donor site. Because of the property's historical significance and association, it was relocated to a new site in Alta Loma, located at 5131 Carnelian Street, Rancho Cucamonga (receiver site), in 2000. After the Compound was moved, it was listed in the National Register.

⁴ Hartig, Anthea. "Sam & Alfreda Maloof Compound, Rancho Cucamonga, San Bernardino County, California." Historic American Buildings Survey, National Park Service, U.S. Department of the Interior (HABS CA-2708). 1999.

The Sam and Alfreda Maloof Foundation for Arts and Crafts is a non-profit, established in 1994 to advance the legacy of Sam and Alfreda Maloof in relation to America's rich arts and craft history. The Foundation operates tours of the Compound, coordinates exhibitions and educational workshops, manages the Maloof art collection, and has established partnerships with both art and academic institutions.⁵

Historic Designation

The Sam and Alfreda Maloof Compound was listed in the National Register in 2010 under Criteria B and C. Its significance under Criterion B is for "its association with [Sam Maloof,] an artistic figure of international prominence..."⁶ and under Criterion C for "the exceptional architectural merit of the house and studio independent of its association with the builder/owner."⁷

In the 1990s, much of Maloof's energy was diverted by the threat to his home and workshop posed by construction of State Route-30 freeway extension (renamed State Route 210) by the California Department of Transportation (Caltrans), negotiations to preserve historic elements of his property, and eventual relocation of his home and workshop. The initial effort to survey the Maloof property under Section 106 began in June of 1990. On May 24, 1994, the Maloofs and San Bernardino Association of Governments (SANBAG) entered into an agreement providing for SANBAG's acquisition of the donor site located at 9553 Highland Avenue (donor site), purchase of a receiver site at 5131 Carnelian Street (receiver site), and preparation of a conservation plan for historic elements of the Maloof property.⁸

The donor site was surveyed and determined eligible for listing in the National Register by consensus using rarely drawn-on exceptions for properties associated with living persons and built within the past 50 years (Criterion Consideration B). Under agreement with SANBAG and Caltrans, the Main House, Guest House, and Workshop 1 were relocated to a receiver site approximately 2.5 miles northwest of the donor site. Guidance contained in *Moving Historic Buildings*,⁹ specified in the Memorandum of Agreement, between SANBAG and Caltrans, was employed to ensure relocation would not affect the qualities that made the property significant. National Register guidance requires application of Criteria Considerations B and G. Based on review of these criteria considerations, the property maintained eligibility.

Period of Significance

As stated in the National Register nomination in 2010, the period of significance for the Compound dates from 1956, when Sam Maloof began constructing the Main House at the original (donor) site, until 2000, when he moved from his long-time family home into the New House at the receiver site.¹⁰

⁵ Bonnie W. Parks and Aaron A. Gallup, Caltrans "California Department of Transportation Architectural Inventory/Evaluation Form: 9553 Highland Avenue, Alta Loma, California" 17 February 1989, revised 6 July 1990.

⁶ Ibid, 3.

⁷ Ibid.

⁸ "Agreement Entered Into By and Among Samuel S. Maloof and Alfreda L. Maloof, Trustees, Under the Maloof Living Trust dated May 22, 1978, Samuel S. and Alfred L. Maloof, as Individuals and the San Bernardino Associated Governments" 24 May 1994.

⁹ John Obed Curtis, *Moving Historic Buildings* (Washington D.C.: American Association for State and Local History, 1979).

¹⁰ Hartig, 12.

VI. PREVIOUS REPORTS AND ASSESSMENTS

This section reviews preliminary reports and assessments, describes the proposed undertaking in greater detail, and evaluates the proposed undertaking for conformance with the *Secretary's Standards*. The summaries below focus on language describing the roofs.

Historical Architectural Survey Report and Historic Resource Evaluation Report for a Proposed Highway on New Alignment, 1989

The Historical Architectural Survey Report and the Historic Resource Evaluation Report were prepared in March 1989 for Harvey Sawyer, Chief of the Environmental Branch of District 8 - San Bernardino in the Department of Transportation by Aaron Gallup, Bonnie W. Parks, Denise O'Connor, and Stephen Mikesell of the Office of Environmental Analysis for the Department of Transportation in Sacramento by using data from a survey conducted between May 1988 and March 1989.

The survey report formally evaluated properties within the study area that were constructed before 1946 and found twelve properties which are listed, determined eligible, or appear eligible for inclusion in the National Register. The Sam and Alfreda Maloof Residence and Studio in Rancho Cucamonga (Alta Loma) was initially found ineligible for the National Register based on this survey. The survey assessed the Maloof 1952 residence building, workshop, and guest house. The survey documented that while the property is clearly associated with an artistic figure of international prominence, the property was excluded from National Register consideration for its association with a living person.¹¹

The report was later revised in 1990, and the Maloof residence and studio was determined eligible for listing the National Register. The State Office of Historic Preservation concurred with this determination that same year.¹² In 1999-2000, Main House, Guesthouse and Workshop 1 were relocated approximately 2.5 miles to the northwest from the original (donor) site at 9553 Highland Avenue to the existing (receiver) site at 5131 Carnelian Street in the Alta Loma area of Rancho Cucamonga. The subject property was subsequently listed in the National Register in 2010.

National Register of Historic Places Nomination, 2010

The subject property was added to the National Register of Historic Places (National Register) on November 9, 2010; the nomination was prepared by Chattel, Inc.

Materials

- Roof Materials: Asphalt: shingles, Metal: corrugated sheet, Other: composition

Main House

- The main house's roof has a combination of low-pitched shed, flat, gable, and square, pyramidal hipped roof towers.

Guest House

¹¹ Harvey Sawyer, Aaron Gallup et al. "Historic Architectural Survey Report and Historic Resource Evaluation Report for a Proposed Highway on New Alignment," prepared for the Department of Transportation, Sacramento. May 1988.

¹² Thirtieth Street Architects, Dike Partnership, Inc., and Kariotis and Associates, "Final Sam and Alfreda Maloof Residence and Studio Relocation Report," prepared for San Bernardino County Transportation Authority, June 15, 1993, 4.

- The flat-roofed structure is accentuated with a pyramid hip roof tower placed just off center.
- The roofing material of the flat-roofed portion is built-up tar/asphalt. Asphalt composition shingles cover the tower's roof. A carved finial rises from the peak of the tower roof.

Workshop 1

- The core of... [Workshop 1] is the original 1954 space to which Maloof built four additions, creating the interplay of a variety of roof heights and building movement that characterizes the site's-built environment.
- Originally a rectangular, shed roof building with metal frame, multi-paned horizontal windows, the workshop had two main shed roof additions and then a tall, narrow, gable roof addition was constructed on the east elevation.

Workshop 2

- Single story with board-on-board siding, it is configured in the same plan as the original workshop: a rectangle with a small, narrow, shed-roofed extension to the north. It features an asphalt shingle roof with overhanging exposed eaves and rounded rafter tails.

There are nine resources on the subject property, including three contributing buildings, five non-contributing buildings and one non-contributing site. The three contributing buildings are the Main House, the Guest House, and Workshop 1. The non-contributing buildings and site were identified as the New House, Workshop 2, Wood storage A and B, and the Sam and Alfreda Ward Maloof grave.¹³

Maloof Main House, Woodshops, and Guest House Building Envelope Waterproofing Survey and Investigation, 2018

As directed by the Foundation, Wiss, Janney, Elstner Associates, Inc. (WJE) was engaged to evaluate the building envelope conditions of the Main House, Woodshop and Guest House. *The Main House, Woodshops, and Guest House Building Envelope Waterproofing Survey and Investigation* draft report was prepared in August 2018 for SAMFAC. The draft report details an assessment of roof areas on the Main House, Guest House (Visitor Center), and woodworking and finishing shops at the subject property.¹⁴

WJE visited the subject property and made general observations of roof conditions. In addition, reported leak location observations were recorded for each of the assessed buildings. Based on the observations, three prioritized repair recommendations were developed:

- Priority 1 – Repair of Leak Locations
 - Options for short-term repair can include replacement of sealants and mastic and coating of metal panel roofs. Long-term repairs would include a full replacement of the built-up asphalt roofs and possible replacement of metal panel roofs.
 - Estimate of Probable Costs: \$8,500
- Priority 2 – Repair of Workshop 1 and Workshop 2

¹³ National Register of Historic Places, Sam and Alfreda Maloof Compound, Rancho Cucamonga, San Bernardino County, California, National Register # 03000471.

¹⁴ Wiss, Janney, Elstner Associates, Inc. "The Maloof Main House, Woodshops, and Guest House: Building Envelope Waterproofing Survey and Investigation." Prepared for Sam and Alfreda Maloof Foundation for Arts and Crafts. August 2018.

- The metal roof panels present a number of conditions at skylights, panel joints, and at exposed fasteners which pose a significant source of water leakage and should be regularly maintained to extend the service life of the roof. The addition of a fluid-applied coating over the metal roof panels at Workshop 1 and Workshop 2 should be considered for a longer-term repair and carried out in the next 2 years.
- Estimate of Probable Costs: \$80,000
- Priority 3 – Repair of Main House and Visitor Center
 - A full roof replacement is recommended within the next 3 to 4 years, provided that deficient flashings and sealants are replaced and maintained in the short-term.
 - Estimate of Probable Costs: \$97,000

Sam and Alfreda Maloof Compound Historic Structure Report, 2019

Sam and Alfreda Maloof Compound Historic Structure Report (HSR) was prepared by Chattel, Inc. in September 2019. The HSR found the Compound is generally in good condition but is experiencing water infiltration in several rooms. The roof at the Main House, Workshop, and Guest House are a combination of flat roofs with built-up asphalt roofs and metal panel roofs. Many of the deficiencies in the built-up asphalt roofs were noted at the roof-to-wall transitions and penetrations, whereas at the metal roofs the deficiencies were related to the penetration detailing, transitions to walls, and at transverse seams and most sealants at vent pipe penetrations are deteriorated.¹⁵ Chattel's recommendations regarding roof repairs and maintenance included:

Main House and Visitor Center Roof

Engage roof contractor with historic preservation experience to repair Main House roof by replacing sealants and mastic and coating of metal panel roofs. Full replacement of the built-up asphalt roofs and possibly replacement of metal panel roofs should occur within the next three to four years.

Workshop 1 and Workshop 2 Roof

Engage roof contractor with historic preservation experience to repair metal roof panels. Currently, panels present a number of conditions at skylights, panel joints, and at exposed fasteners which pose a significant source of water leakage and should be regularly maintained to extend the service life of the roof. The addition of a fluid-applied coating over the metal roof panels at Workshop 1 and Workshop 2 should be considered for a longer-term repair and carried out in the next two years.¹⁶

Sam & Alfreda Maloof Foundation Roof Replacement, 2022

As part of the roof repair and replacement design project, WJE conducted roof surveys to document the various existing roofing assemblies, roof slopes, and interface conditions. WJE, with the assistance of a contractor, also conducted roof core extractions at the flat roofs. The August 12, 2022 memorandum summarized WJE's opinion regarding the pros and cons of various recommended roof systems options and the risks associated with each, as well as general roof design considerations. The goal of the memorandum was to assist the Foundation with selection of the roof replacement systems and to receive input from the NPS on selection criteria and preferences as they may relate to long-term maintenance and aesthetic features of

¹⁵ Chattel, Inc. "Same and Alfreda Compound Historic Structure Report." Prepared for Sam and Alfreda Maloof Foundation for Arts and Crafts. September 2019.

¹⁶ Ibid.

the complex.¹⁷ Chattel participated as a design collaborator with WJE and Foundation in developing recommendations contained in the WJE August 12, 2022 report.

WJE provided condition assessments and recommendations on the flat and shed metal roofs.

Flat Roofs: The existing flat roofs are composed of built-up roofing (BUR) made up of roofing pea gravel ballast over three plies of roofing felt separated by layers of hot-applied asphalt waterproofing. The roofing is applied directly to the wood substrate in most area.

Conditions

- Limited slope, with zero or negative slope in some areas
- Limited height clearances for perimeter flashing at the siding.
 - Generally, clearance at the siding ranged from 15/16 inch to 6-3/4 inch
- Limited height clearances at clerestory windows
- No kickout flashing at roof intersection with adjacent sidewalls in some locations
- No insulation present above the roof sheathing
- One area with no roof sheathing
 - The north end of the conference room (at the patio area) includes fiberboard sheathing/insulation as the substrate for the built-up roofing assembly.

Recommendations & Repairs

- Removal of the existing pea gravel
- Demolition and removal of existing roof membrane
- Repairs or replacement of any damaged wood roof sheathing substrate
- Partial removal and storage of building horizontal and wood shingle sidings to expose vertical leg and attachment of flashings.
- Partial removal of lower fasteners for the vertical siding to expose vertical leg and attachment of flashings
- Removal of base of wall flashings.
- Assessment of wood rafters
- Replacement of interior ceiling wood boards as necessary and where applicable
- Possible option for installation of high-density insulation cover board
- Installation of roofing assembly
- Installation of new counterflashing and kickout flashing
- Reinstallation of existing base of wall wood siding

Roofing Assembly System Options

- Option 1: In-Kind Replacement
 - Traditional BUR roof assemblies are more tolerant to zero slope configurations than modern roofing systems that industry standards recommend 1/4. inch per foot minimum slope. Due to slope limitations based on available vertical flashing heights at rising walls, the first option consists of in-kind replacement with a BUR system.
- Option 2: Modified Bitumen Roofing Assembly

¹⁷ Wiss, Janney, Elstner Associates, Inc. "Sam and Alfreda Maloof Foundation Roof Replacement." Prepared for Sam and Alfreda Maloof Foundation for Arts and Crafts. August 2022.

- Replacement of flat roofs consisting of a two-ply modified bitumen roof system with pea gravel surfacing.

Fiberboard/Insulation Replacement

- Conference Room Patio Area will require modification to include wood sheathing and assessment of the conditions of the existing fiberboard.
- Replacement of the existing fiberboard should be anticipated.

Kitchen and Conference Room

- Option 1: Replace fiberboard as needed where damaged.
 - Note extent of damage may not be visible until roof removal, the boards may be salvageable.
- Option 2: Repaint interior side of fiberboard as needed where damaged (Not an option if the fiberboard is also considered the roof deck and board must be planned for replacement in that scenario).

Wood Siding Transition

- Recommended Option 1: Cut a portion of the bottom of vertical boards and modify horizontal siding and shingles as necessary to allow for increased vertical upturn of the roofing assembly.
- Option 2: Maintain the current elevation for roofing termination with minimal to no modifications to the wood siding.

Metal Shed Roofs Conditions

- Limited slope is present at the metal panel roofs (Workshop 1, Workshop 2, and Master Bathroom).
- The National Roofing Contractors Association (NRCA) recommends that architectural metal panel systems in general have a minimum 3:12 slope. For metal panel roofing with exposed fasteners, 4:12 slope (33.3%) is recommended.
 - The Workshop 1 slope is 8.75%
 - The Workshop 2 slope ranges between 5.94% to 7.1%
 - The Main House Master Bathroom slope is 13.5%
- The majority of the deficiencies noted at the metal panel roofs are related to penetration detailing (including skylights), transitions to walls, and at transverse seams.
- Crickets are not present at the high side of skylights as are recommended by NRCA in metal roofing.

Recommendations & Repairs

For the existing shed slope metal roofs there are three possible options available for replacement.

- Option 1: In-Kind Replacement
 - This option would maintain the trapezoidal/corrugated rib pattern matching the existing profile and exposed fastener configuration.
- Option 2: Alternate Metal Roof, Standing Seam
 - This option would include replacement of the metal panel roofs with a standing seam metal roof.
- Option 3: Alternate Material, Single-Ply Roofing
 - The basis-of-design for this option would include an adhered single-ply PVC roofing membrane
- Summary: Metal Panel Roof Repair

- Neither of the two metal options meet NRCA guidelines for slope requirements, therefore from a functional perspective an alternate material such as PVC or other single ply roofing membranes is recommended that can perform with the available roofing slopes to achieve more reliable long-term performance.

Insulation Considerations for Metal and Flat Roofs

- Option 1: Maintain Existing Insulation Conditions
 - Recommend pursuing a variance from current requirements of the CBC, which could be possible through the California Historic Building Code.
- Option 2: Localized Insulation Modifications
 - Additional insulation will be added to meet current code requirements. This generally includes the metal roofs being replaced.
 - Avoid insulation at areas around clerestory windows and other conditions that would significantly alter the building's cladding and envelope conditions.
 - Modify skylight curbs to accommodate added insulation.
 - The addition of localized insulation will still require a variance from meeting all the roof replacement code requirements.

Repair Considerations

WJE recommends that the Foundation budget for a routine and periodic maintenance program at all roof areas. This includes periodic visual inspection of all roof areas by a qualified roofing contractor along with isolated repairs as necessary to maintain the condition of the roofing to achieve long-term performance. In addition, and specifically, we have discussed the condition of existing trapezoidal metal roofs with exposed fasteners.

The WJE August 12, 2022 memorandum was shared with NPS staff for review and comment. Based on response received, NPS did not object to any of the options considered. As a result, Foundation, WJE and Chattel moved forward to prepare design and construction documents with some flexibility in final selection of treatments.

VII. FINDING OF EFFECT

The following section describes the proposed undertaking in greater detail and evaluates it for conformance with the *Secretary's Standards*. This analysis is based on review of design and construction documents prepared by WJE dated June 26, 2023.

General Existing Conditions

As the proposed undertaking only involves repairs and replacements made to the roofs and a balcony of the Compound, this section focuses only on description of the roof areas and excludes other aspects of building fabric. The Compound has three roof types: built-up asphalt, sloped metal panel roofs, and trapezoidal sheet metal roofs. A balcony (south balcony) is located at the south elevation of the Main House and has trellis with extended rafter tails. Please refer to Image 1 for an aerial view of the Compound with roof code system.



Image 1: Aerial image of Maloof Compound proposed repair and replacement of roofs. Refer to Attachment C Maloof Table for roof code, location, proposed roof types, recommendations, and comments. Orange indicates flat roofs to be replaced, purple indicates metal roofs to be replaced, red indicates south balcony to be replaced, yellow indicates metal roofs that are additive alternate (high priority), green indicates metal roofs that are additive

alternate (low priority), and blue indicates typical trapezoidal sheet metal roofs (see Attachment C Maloof Roof Table).

The built-up asphalt roofs (flat roofs) are flat and comprised of pea gravel ballast over three plies of felt separated by layers of hot-applied asphalt waterproofing. All flat roofs have wood fascia boards and rafter tails, with visible water damage and deterioration at various locations. Roofs of this type include A.1, A.2, A.3, B.2, and D. Roofs that are visible from the second floor of surrounding rooms include A.1, A.3 and B.2. The flat roof at D is visible from the north driveway that leads to the Compound. A masonry chimney is located centrally at A.1, and most likely consists of a brick concrete material. Fixed skylights are located at A.1. The flat roofs, especially A.1 and A.3, have a variety of penetrations with pop-up, shed and trapezoidal metal roofs, with both wood siding and clerestory windows, featuring a range of design types. Where other roof types connect to flat roofs, they consist of both wood siding and clerestory windows. The wall bases and clerestory windows either have low or zero clearance, with some instances of the materials at level with pea gravel ballast. The only roof with mechanical units is B.2.

The sloped metal panel roofs (metal roofs) are comprised of corrugated grey rib metal and slope in a single direction of north, east, south, or west. All metal roofs have wood fascia boards, with visible water damage and deterioration at various locations. Roofs of this type include A.4, A.5, A.6, A.7, A.9, B.1, and C. Fixed skylights are located on A.4 and B.1.

The trapezoidal sheet metal roofs (trapezoidal roofs) have a variety of slope types including trapezoidal, gabled, or shed and consist of blue corrugated sheet metal. The trapezoidal roofs extend the height of all flat roofs, with some resting on wooden towers.

The south balcony at the Main House is accessed from the second floor and has a trellis with extended rafter tails. Rafters that run north-south extend beyond the south balcony deck below and support square trellis members that run east-west above. The current condition of the rafter tails is poor, with water damage causing deterioration. The waterproof deck is minimally sloped to the south and has an area drain.

Proposed Undertaking Description

The proposed undertaking includes repair and replacement of existing roofs at the Main House, Workshop 1, Workshop 2, and Guest House. The proposed undertaking also includes repair of the south balcony and its trellis at the Main House. Additive Alternates include additional metal roof replacement locations, replacement material at zero clearance windowsills, repair of trapezoidal roofs with new screws and neoprene washers, and use of bonderized sheet metal flashing in lieu of aluminum. Mold is reportedly present in Workshop 1 and removal should be considered within the proposed undertaking. Assessments of fiberboard ceilings "Celotex" panels, at the kitchen and conference room will be conducted and in-kind replacement of these materials is anticipated.

Flat roofs and metal roofs would receive minimal in-kind replacement of assembly systems, insulation, and remove existing woodpecker damage, and water-damage. Decayed wood-siding would be replaced with compatible new wood material. Single-ply metal roofs will receive added polyisocyanurate (polyiso) rigid insulation that is 2-inches in thickness. The wood eaves and fascia material, vertical trim, horizontal trim, window trim, and attic vent wood components would be removed and replaced in-kind with material to match existing type, size, and finish. Vertical redwood siding would be removed and replaced in-kind to match existing type, pattern, and finish. Water table clapboard siding (described as ship-lap in drawings) and metal trim would be

removed and replaced in-kind with material to match existing type, size, pattern, and finish. South balcony repairs include isolated replacement of wood framing fabric such as trellis rafters, beams, and columns, with new plywood deck installed.

Replacement

Built-up Roof

The existing built-up asphalt roof (flat roof) with gravel surfacing is proposed with in-kind replacement at roofs A.1, A.2, A.3, and D and the canopies at C. Proposed work at these locations includes removal of existing built-up roof system down to the existing wood plank deck or structural roof panel deck. Installation of new roof assembly system will consist of red rosin paper, mechanically fastened base sheet, hot-applied four-ply built-up roofing system, and flood coat of asphalt with pea gravel surfacing. Existing conduits at all flat roofs will be temporarily disconnected during installation of new roof assembly system. New aluminum edge flashing will be added at isolated areas at all flat roofs, with installation occurring over the new built-up roof system. Areas with protruding rafters will have aluminum edge flashing “caps” placed onto the top and sides of wood rafters. A new gutter and downspout are proposed at A.2. The plumbing vents at all flat roofs will receive new flashing caps over existing plumbing vent stacks.

Metal Panel Roof

The existing metal panel roofs (metal roof) are proposed with replacement materials at roofs A.4, B.1, and C. Proposed work includes removal of existing metal panel roof system down to the existing wood deck and installation of new roof assembly consisting of vapor retarder/temporary roof membrane, polyiso insulation, cover board, and adhered single polyvinyl chloride (PVC) roof membrane that is grey in color. Isolated areas with damaged and deteriorating wood fascia boards will be replaced as needed at A.4 and B.1. While none of the metal roofs have rafter tails, all metal roofs will receive new edge flashing. Typical plumbing vent flashing is proposed at all metal roofs. New gutter and downspout will be installed at C.

Skylight Replacement

The existing skylights at A.1, A.4, B.1, and C will be replaced in-kind. Many of the skylights have low or zero clearance, and where necessary, curbs will be raised to accommodate minimum roof base flashing height. Roofing crickets will provide tapered insulation at high sides of skylights in accordance with the National Roofing Contractors Association guidelines.

Repair

Chimney Coating

Repairs to the chimney at A.1, include applying coating sealant to protect the concrete blocks. Proposed product includes KlereSeal 910-W/920-W by Pecora Corporation. The roof base flashing would extend up vertically at chimney, and new prefinished aluminum counterflashing would be fastened to concrete blocks.

Miscellaneous Carpentry Work

At areas where varying roof types intersect, the existing wood-clad wall bases and clerestory windows will receive new flashing at base and replacement siding. Siding repairs at the base of flat and metal roofs will remove the bottom horizontal wood siding or detach bottom edge of vertical wood siding to allow for new flashing and roof membrane to be installed. At areas with low or zero clearance clerestory windows, wood trim and siding will be temporarily removed to install new flashing, and fluid applied membrane will be installed at clerestory windowsills to maintain existing opening sizes. Damaged rafter tails will be repaired where occurs.

South Balcony

Proposed work at A.8 involves repair and isolated replacement of wood framing fabric at south balcony. The south balcony will be temporarily shored to perform stabilization repairs as needed during construction. Isolated replacement will be conducted to the trellis rafters, horizontal beams, and vertical columns. All materials will be replaced in-kind, with existing structural hardware and fasteners to be retained, salvaged, and later reinstalled. The existing waterproof deck will be replaced with new plywood deck and pedestrian traffic coating will also be added as the finish walk surface for the balcony. Existing wood threshold at door will be replaced with new wood threshold, set in sealant and covered with a sloped aluminum threshold. A sheet metal sill pan with continuous back and end dams will also be installed and integrated with new traffic coating. The area drain will have a grate and installed flush with finish surface, and a downspout that attaches to an adjacent deck post.

Additive Alternate

Additive Alternates include additional metal roof replacement locations, replacement material at zero clearance windows, repair of trapezoidal roofs with new screws and neoprene washers, use of bonderized sheet metal flashing in place of aluminum, removal of mold at Workshop 1 and replacement of damaged fiberboard panels at interior.

Alternate No. 1 – Additional Metal Panel Roof Replacement

Perform same scope of work for metal roofs at five additional roof areas at A.5, A.6, A.7, A.9, and A.10.

Alternate No. 2 – Alternate Flat Roof Replacement Material

Perform same scope of work for flat roofs, except new roof assembly is to consist of: two-ply granular surfaced modified bitumen roof membrane in lieu of four-ply built-up roofing system.

Alternate No. 3 – Zero Clearance Window Replacement Material

Replace zero clearance clerestory windows similar in type design, except 6 inches shorter than existing; install new wood curb and extend roof flashing up the curb below the window. Alternate No. 3 is not to be considered for the window located on roof A.8.

Alternate No. 4 – Exposed Fastener Replacement

Replace screw fasteners and neoprene washers at metal panel roofs to remain at roof areas A.1-A.7, A.9-A.10, and D.

Alternate No. 5 – Sheet Metal Flashing Alternate Materials

Where flashing occurs, bonderized sheet metal flashing will be used as an alternative to aluminum throughout.

Alternate No. 6 – Mold Removal

Mold that is present in Workshop 1 would be removed.

Alternate No. 7 – Celotex Panels

Damaged fiberboard ceiling “Celotex” panels at the interior would be replaced in-kind.

Secretary's Standards Conformance

As is further explained below, the proposed project is found to conform with the Rehabilitation Standards of the *Secretary's Standards*. If the proposed undertaking conforms with the *Secretary's Standards*, it has no adverse effect (36 CFR 800.5(b)).

- The proposed undertaking would retain the current use of the Compound. Therefore, the proposed undertaking is in conformance with Standard 1.
- The proposed undertaking would retain and preserve the historic character of the Compound. Removal of historic materials at the roof would be replaced in-kind or with substitute materials that are generally not visible from grade or upper floor windows to extend useful life of the buildings. The replaced materials would maintain the features and spaces that characterize the property. Increasing the depth of the flat roof assembly to include four-ply built-up roofing system and replacement of materials at metal roofs to include new single-ply PVC roof membrane that is grey in color, would not impair the historic character of the property. Therefore, the proposed undertaking is in conformance with Standard 2.
- The proposed undertaking would not create a false sense of historical development. The proposed undertaking does not include construction of any conjectural features which were never constructed. Historic materials that will be repaired or replaced, will be done so using in-kind or substitute materials that would not be generally visible from grade. Therefore, the proposed undertaking is in conformance with Standard 3.
- The proposed undertaking would retain and preserve alterations that have acquired significance over time. Therefore, the proposed undertaking is in conformance with Standard 4.
- The proposed undertaking would preserve distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize the subject property. Character-defining features that demonstrate workmanship, such as the clerestory windows, wood siding, and rafter tails would be retained and repaired as necessary. Portions of the horizontal and vertical wood sidings will be temporarily removed in identified locations for the purposes of installing new flashing and roof membrane. Fluid applied flashing membrane will be installed at clerestory windowsills so as to maintain existing opening sizes. Therefore, the proposed undertaking is in conformance with Standard 5.
- The proposed undertaking would rehabilitate existing historic features. Where historic features have been severely deteriorated, they would be replaced in-kind with materials to match existing or with replacement materials that are not visible from grade or upper floor windows. Existing clerestory windows would be retained with reinforced fluid-applied flashing membrane installed to prolong the operable lifespan. At the south balcony, deteriorated rafters would be replaced in-kind where necessary, with hardware and fasteners retained and later installed. All roofs will receive new edge flashing, and all protruding wood rafter tails will have aluminum "caps" installed. Therefore, the proposed undertaking is in conformance with Standard 6.

- The proposed undertaking would not use chemical or physical treatments that cause damage to historic materials. Therefore, the proposed undertaking is in conformance with Standard 7.
- The proposed undertaking does not include any ground disturbance and therefore is in conformance with Standard 8.
- The proposed undertaking would not substantially destroy historic materials that characterize the subject property. Historic materials that are damaged would be repaired or replaced in-kind. Replacement of the built-up asphalt roof is appropriate in material, style and workmanship, and will extend the usability of the subject property. Replacement of metal roof with 2-inches of polyiso insulation including a minimally thicker edge and grey single-ply PVC roofing membrane are at roof areas with low-visibility. While skylights will be replaced at the Main House, Workshop 1 and Workshop 2, these are generally located in roof areas not visible from grade or upper floors. Clerestory windows will be retained and have a fluid applied membrane installed to preserve the historic window openings. Temporary removal of wood-clad sidings at window wall bases will provide opportunity for new flashing to be installed. Isolated repairs at the south balcony would prioritize replacement of deteriorated rafters, beams, and columns with in-kind materials and retain existing structural hardware and fasteners. A new plywood deck with traffic coating will replace existing contemporary walk surface finish at south balcony. Therefore, the proposed undertaking is in conformance with Standard 9.
- The proposed undertaking would not have any new additions or adjacent related new construction which would impair the essential form and integrity of the Compound. Therefore, the proposed undertaking is in conformance with Standard 10.

VII. CONCLUSION

This report evaluated whether the proposed undertaking will have any adverse effect on the Sam and Alfreda Maloof Compound, a historic property, under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations. The proposed undertaking involves repair and replacement of four roofs on the Main House, Workshop 1, Workshop 2, and Guest House. The APE is the approximately 5.5-acre National Register-listed property. Replacement of metal roofs with new roofing system, including installation of 2-inches of polyiso insulation with a slightly thicker edge and application of a single-ply PVC roofing membrane will occur in roof areas with low-visibility. Additive alternates include additional repairs and replacements at these four roofs. Analysis of the proposed undertaking as described in this report finds that it is in conformance with the *Secretary's Standards* and constitutes a finding of no adverse effect under Section 106.

IX. BIBLIOGRAPHY

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ATTACHMENT A:
HISTORIC IMAGES

**SAM AND ALFREDA MALOOF COMPOUND
5131 CARNELIAN STREET, ALTA LOMA**

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SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 1: Workshop 1 (left) and Workshop 2 (right), view west of east elevations (HABS, 2003)



Image 2: Workshop 1 north elevation (left) and west elevation (right), view west (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 3: Main House, west elevation, view east (HABS, 2003)



Image 4: Main House, west elevation (right) and north elevation (left), view southeast (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 5: Main House, east elevation, view west (HABS, 2003)



Image 6: Main House, east elevation (left) and south elevation (right), view northwest (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 7: Main House, south elevation, view northeast (HABS, 2003)



Image 8: Main House, east elevation (left) and south elevation (right), view northwest (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 9: Main House, south elevation (left) and north elevation (right), view north (HABS, 2003)



Image 10: Workshop 1 (left) and Main House (right), view east (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 11: Main House, primary entrance to inner court, view south (HABS, 2003)



Image 12: Main House, inner courtyard, view north (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 13: Main House, north elevation, view south (HABS, 2003)



Image 14: Main House, east elevation, view west (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 15: Main House, roof, view southeast (HABS, 2003)



Image 16: Main House, roof, view south (HABS, 2003)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN STREET, ALTA LOMA
ATTACHMENT A: HISTORIC IMAGES



Image 17: Guest House, view northwest (HABS, 2003)

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ATTACHMENT B:
CONTEMPORARY PHOTOGRAPHS

**SAM AND ALFREDA MALOOF COMPOUND
5131 CARNELIAN STREET
ALTA LOMA, CALIFORNIA**

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SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN ST, ALTA LOMA, CALIFORNIA
ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 1: Main House, view east (Chattel, 2022)



Image 2: Main House, view northeast (Chattel, 2022)

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Image 3: Workshop 2, east elevation, view west (Chattel, 2022)



Image 4: Workshop 1 (left) and Workshop 2 (right), view west (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 5: Workshop 1 (right) and Workshop 2 (left), view east (Chattel, 2022)



Image 6: Workshop 1 (left) and Main House (right), view east (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 7: Main House, south elevation, view northeast (Chattel, 2022)



Image 8: Main House, south elevation, view northwest (Chattel, 2022)

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Image 9: Main House, south elevation, view northwest (Chattel, 2022)



Image 10: Detail of metal cap on rafter tail, view northwest (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 11: View of second-floor south balcony, view northwest (Chattel, 2022)



Image 12: Main House, south elevation (left) east elevation (right), view northwest (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 13: Main House, east elevation, view west (Chattel, 2022)



Image 14: Main House, east elevation, view northwest (Chattel, 2022)

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Image 15: Main House, north elevation, view southeast (Chattel, 2022)



Image 16: Detail of rafters at Main House north elevation entrance, view south (Chattel, 2022)

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Image 17: Detail of rafters at south balcony, view north (Chattel, 2022)



Image 18: Detail of deteriorating rafter at south balcony, view northwest (Chattel, 2022)

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Image 19: Main House, built-up asphalt roof with gravel surfacing, view east (Chattel, 2022)



Image 20: Main House, built-up asphalt roof with gravel surfacing, view east. Note wood shake siding. (Chattel, 2022)

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Image 21: Main House, built-up asphalt roof with gravel surfacing, view north (Chattel, 2022)



Image 22: Detail of horizontal wood siding (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 23: Main House, interior at breakfast nook (Chattel, 2022)



Image 24: Detail of water damage on wood clad walls (Chattel, 2022)

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Image 25: Main House, interior at conference room, view northeast (Chattel, 2022)



Image 26: Detail of water damage at ceiling (Chattel, 2022)

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ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 27: Guest House, north elevation (right) and east elevation (left), view southwest (Chattel, 2022)



Image 28: Guest House, east elevation, view west (Chattel, 2022)

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Image 29: Detail of built-up asphalt roof with gravel surfacing at Guest House, view southwest (Chattel, 2022)



Image 30: Detail of rafters at Guest House roof (Chattel, 2022)

SAM AND ALFREDA MALOOF COMPOUND, 5131 CARNELIAN ST, ALTA LOMA, CALIFORNIA
ATTACHMENT C: CONTEMPORARY PHOTOGRAPHS



Image 32: Sample of PVC roofing membrane materials (Chattel, 2022)

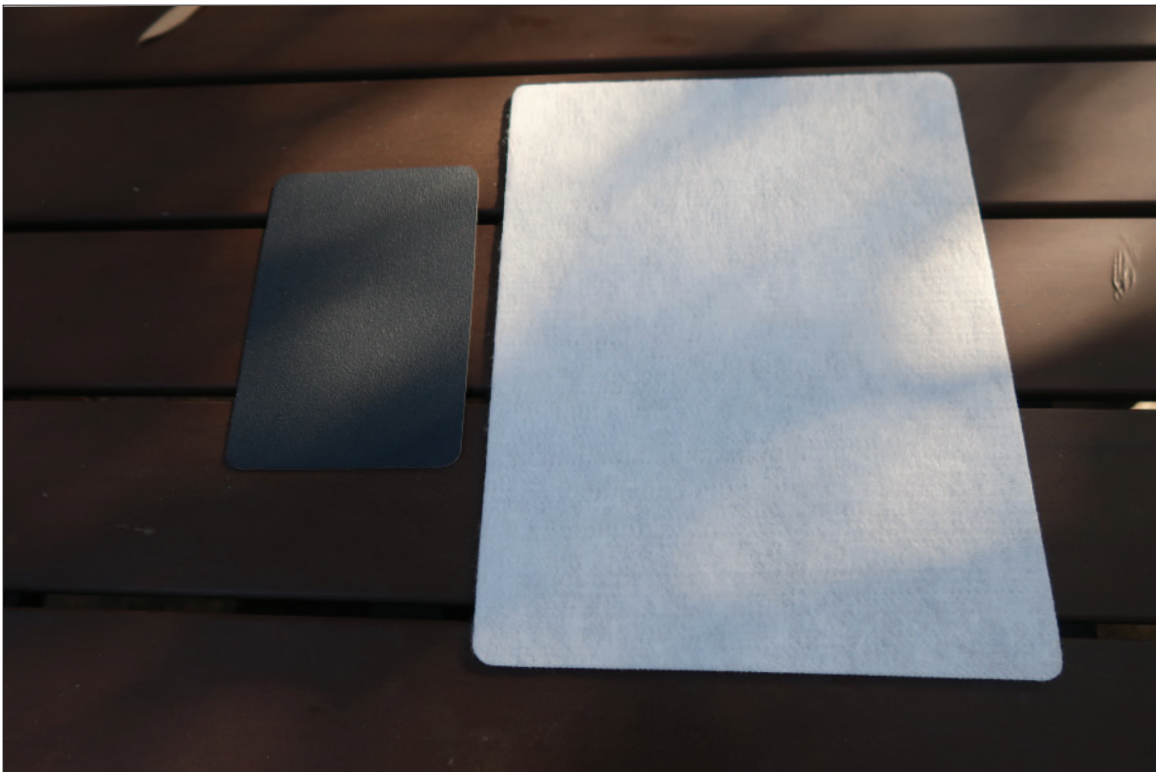


Image 33: Detail of front (right) and back (left) of PVC roofing membrane materials (Chattel, 2022)

ATTACHMENT C:
MALOOF ROOF TABLE

**SAM AND ALFREDA MALOOF COMPOUND
5131 CARNELIAN STREET, ALTA LOMA**

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Maloof Roof Repair & Replacement



Aerial image of Maloof Compound proposed repair and replacement of roofs. Orange indicates flat roofs to be replaced, purple indicates metal roofs to be replaced, red indicates balcony trellis to be replaced, yellow indicates metal roofs that are additive alternate (high priority), green indicates metal roofs additive alternate (low priority), and blue indicates typical trapazoidal sheet metal roofs.

Maloof Roof Repair & Replacement

Roof Code	Roof Section	Roof Type	Repair/Replace	Slope	Sloping Direction	Added Insulation	Interior Water Damage	WJE 2022 Memo
A.1	Main House (West) Conference Room	Flat Roof: Built-up asphalt roof w/ gravel surfacing	Replace	Limited: Zero to Negative	Flat	No	Damaged fiberboards	Test needed to assess condition of existing fiberboards for anticipated replacement (Fiberboard/Insulation Replacement). Plan for Option 1, In-kind replacement as needed (Kitchen and Conference Room). Option 1, Maintain existing insulation conditions, code variance (Flat Roofs)
A.2	Pyramid Room	Flat Roof: Built-up asphalt roof w/ gravel surfacing	Replace	Limited: Zero to Negative	Flat	No	N/A	Test Both Option 1 & Option 2 (Roofing Assembly System). Option 1, Maintain Existing Insulation Conditions, code variance (Flat Roofs).
A.3	Main House (East)	Flat Roof: Built-up asphalt roof w/ gravel surfacing	Replace	N/A	Flat	No	N/A	Test Both Option 1 & Option 2 (Roofing Assembly System). Option 1, Maintain Existing Insulation Conditions, code variance (Flat Roofs).
A.4	Primary Bathroom	Metal Roof	Replace	13.50%	East	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
A.5	Main House (Breakfast Nook)	Metal Roof: Alternate Additional Roof	Additive Alternate (high priority)	N/A	West	Yes	Damaged wood ceiling and sideboards	Plan for Option 1, In-kind replacement as needed (Kitchen and Conference Room).
A.6	Main House (Upstairs Gallery)	Metal Roof: Alternate Additional Roof	Additive Alternate (high priority)	N/A	South	Yes	Damaged fiberboards	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
A.7	Main House (Central)	Metal Roof Alternate Additional Roof	Additive Alternate (high priority)	N/A	South	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
A.8	South Balcony	Trellis with Rafters Tails	Consideration of Replacement	N/A	Flat	No	Rafter tails damaged	Replace damaged rafter tail ends, cover with metal caps
A.9	Patio Entrance	Metal Roof	Additive Alternate (low priority)	N/A	North	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
A.10	Main House (North)	Metal Roof	Additive Alternate (low priority)	N/A	North	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
B.1	Workshop 1 (East)	Metal Roof	Replace	8.75%	South	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
B.2	Workshop 1 (West)	Flat Roof: Built-up asphalt roof w/ gravel surfacing	Replace	Limited: Zero to Negative	Flat	No	N/A	Test Both Option 1 & Option 2 (Roofing Assembly System). Option 1, Maintain Existing Insulation Conditions, code variance (Flat Roofs).
C	Workshop 2	Metal Roof	Replace	5.95% to 7.1%	South	Yes	N/A	Option 3 - Alteranate Material - Single-Ply Roofing (Metal Roof Repair & Replacement)
D	Guest House	Flat Roof: Built-up ashphalt w/gravel surfacing	Replace	Limited: Zero to Negative	Flat	No	N/A	Test Both Option 1 & Option 2 (Roofing Assembly System). Option 1, Maintain Existing Insulation Conditions, code variance (Flat Roofs). No metal caps on rafter tail ends.
E	Typical Trapazoidal Sheet Metal Roof Roof	Sheet Metal Roof	Repair	N/A	North,East,South,Wes t	No	N/A	Trapezoidal sheet metal roofs to be repaired with neoprene washers.

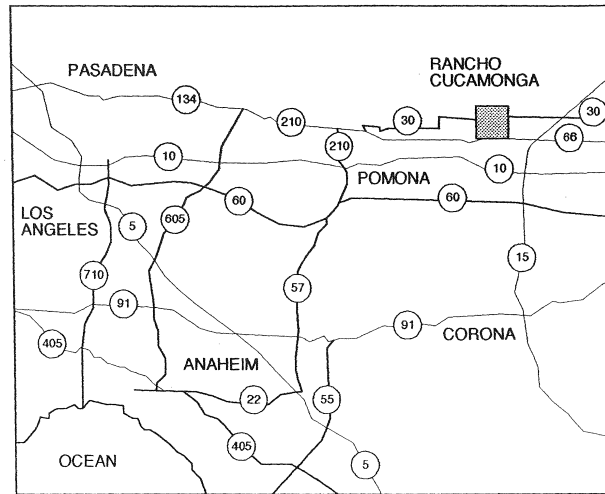
ATTACHMENT D:
MAPS

**SAM AND ALFREDA MALOOF COMPOUND
5131 CARNELIAN STREET, ALTA LOMA**

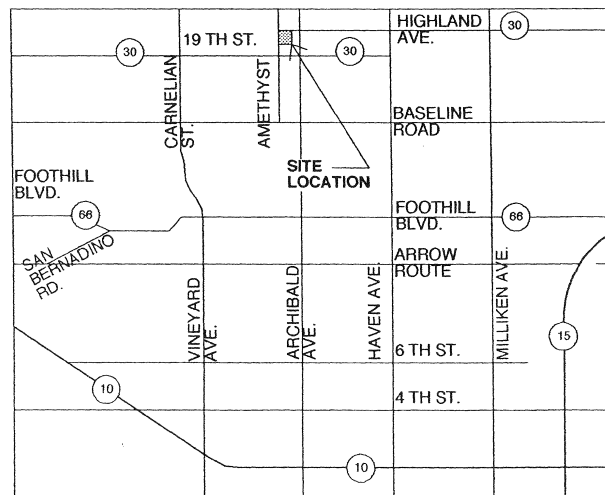
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SAM AND ALFREDA MALOOF COMPOUND,
ATTACHMENT D - MAPS

SAM AND ALFREDA MALOOF COMPOUND
HABS No. CA-2708 (PAGE 34)



City Location Map

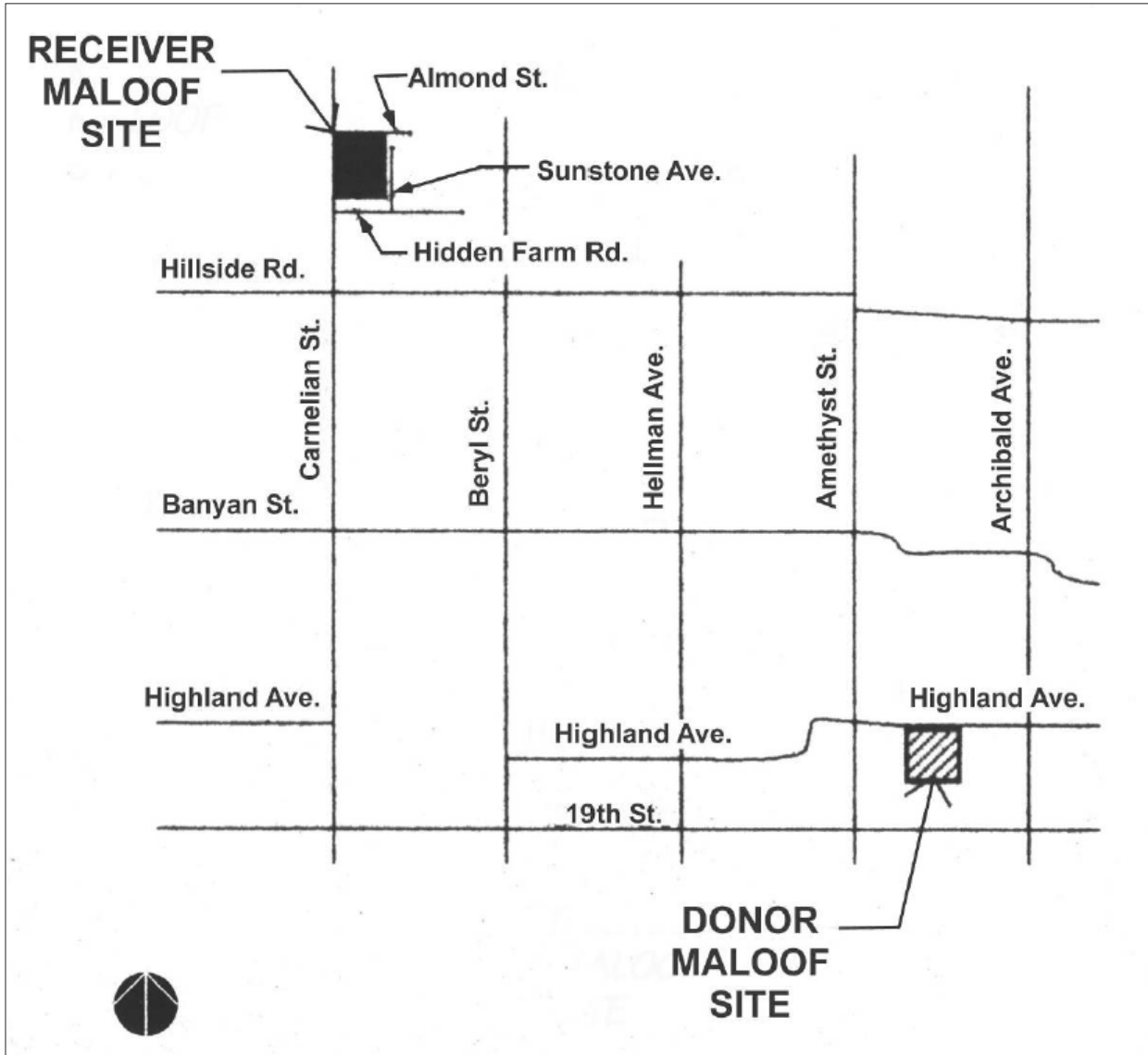


Vicinity Map

FIGURE 6
City Location Map and Vicinity Map

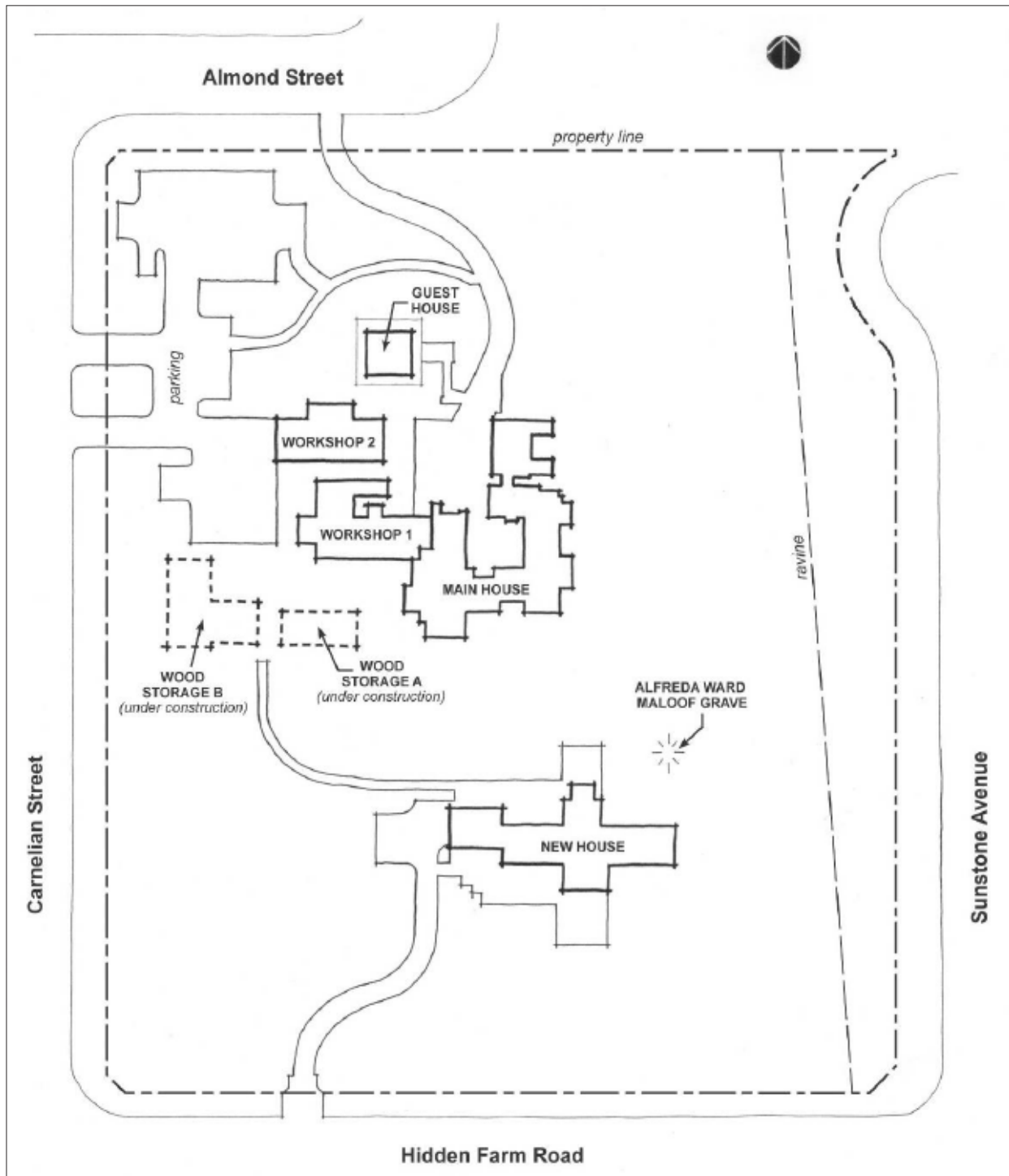
Map 1: Sam and Alfreda Malood Compound city location map and vicinity map, prior to move, circa 1999. (Historic American Building Survey No. CA-2708)

SAM AND ALFREDA MALOOF COMPOUND
ATTACHMENT D - MAPS



Map 2: Vicinity map showing donor Maloof site and receiver Maloof site.
(National Register Nomination, 2010)

SAM AND ALFREDA MALOOF COMPOUND,
ATTACHMENT D - MAPS



Map 3: Receiver Maloof site, circa 2002. (National Register Nomination, 2010)

ATTACHMENT E:
WJE ROOF REPLACEMENT MEMORANDUM

**SAM AND ALFREDA MALOOF COMPOUND
5131 CARNELIAN STREET, ALTA LOMA**

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MEMORANDUM | August 12, 2022

Sam & Alfreda Maloof Foundation Roof Replacement Roof Design Considerations & Options

WJE PROJECT NO. 2020.3805

TO	Jim Rawitsch Executive Director The Sam and Alfreda Maloof Foundation for Arts and Crafts 5131 Carnelian Street Rancho Cucamonga, California 91701
CC	Melanie Swezey-Cleaves, The Sam and Alfreda Maloof Foundation for Arts and Crafts Robert Chattel, Chattel, Inc.
FROM	Michelle Sandoval Marcinek, WJE Joe Zale, WJE

As part of the roof repair and replacement design project, Wiss, Janney, Elstner Associates Inc. (WJE) conducted roof surveys to document the various existing roofing assemblies, roof slopes, and interface conditions. WJE also completed roof core extractions at the flat roofs. This memorandum summarizes WJE's opinion regarding the pros and cons of various recommended roof systems options and the risks associated with each, as well as general roof design considerations. The goal of the memorandum is to assist the Sam & Alfreda Maloof Foundation (Foundation) with selection of the roof replacement systems and to receive input from the National Park Service (NPS) on selection criteria and preferences as they may relate to long-term maintenance and aesthetic features of the complex.

EXISTING CONDITIONS AND LIMITATIONS

Overall, the roof assemblies and substrate conditions at the flat roofs are not all consistent; however, the roof conditions appear to be in a similar state, with some areas exhibiting more deterioration than others. The shed metal roofs are more consistent in their assembly and observed conditions.

Flat Roofs

The following outlines noteworthy conditions observed at the flat roofs that affect roof replacement options:

- Limited slope, with zero or negative slope in some areas
- Limited height clearances for perimeter flashing at the siding.
 - Generally, clearance at the siding ranged from 15/16" to 6-3/4"
- Limited height clearances at clerestory windows
- No kickout flashing at roof intersection with adjacent sidewalls in some locations
- No insulation present above the roof sheathing
- One area with no roof sheathing
 - The north end of the conference room (at the patio area) includes fiberboard sheathing/insulation as the substrate for the built-up roofing assembly.

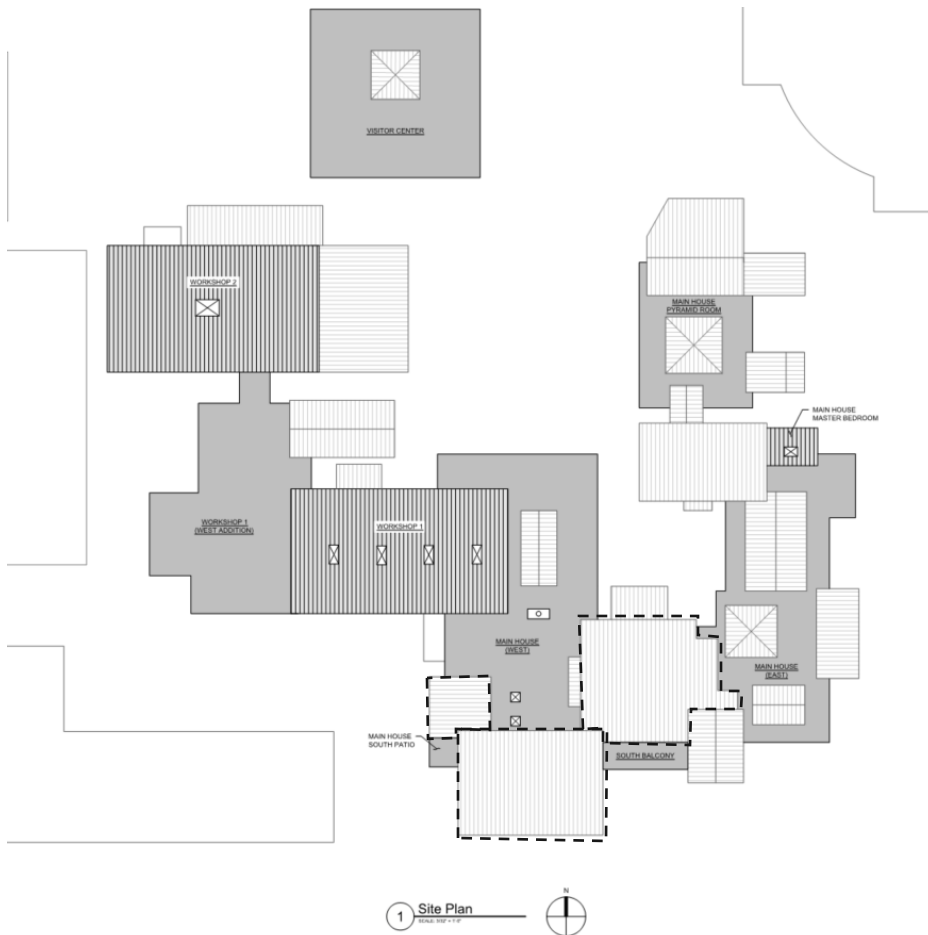


Figure 1. Site plan with flat roofs and metal roofs to be replaced labeled by location. Flat roofs to be replaced are shaded gray and metal roofs to be replaced include black lines representing metal seams. Three potential alternate additional roofs are shown with a dashed boundary line related to poor insulative performance.

Metal Roofs

The following noteworthy conditions were observed at the metal roofs pertinent to replacement options:

- Limited slope is present at the metal panel roofs (Workshop 1, Workshop 2, and Master Bathroom). The National Roofing Contractors Association (NRCA) recommends that architectural metal panel systems in general have a minimum 3:12 slope. For metal panel roofing with exposed fasteners, 4:12 slope (33.3%) is recommended.
 - The Workshop 1 slope is 8.75%
 - The Workshop 2 slope ranges between 5.94% to 7.1%
 - The Main House Master Bathroom slope is 13.5%
- The majority of the deficiencies noted at the metal panel roofs are related to penetration detailing (including skylights), transitions to walls, and at transverse seams.
- Crickets are not present at the high side of skylights as are recommended by NRCA in metal roofing.

FLAT ROOF REPAIR & REPLACEMENT OPTIONS

The existing flat roofs are composed of built-up roofing (BUR) made up of roofing pea gravel ballast over three plies of roofing felt separated by layers of hot-applied asphalt waterproofing. The roofing is applied directly to the wood substrate in most areas. Areas with new OSB sheathing, assumed to be installed during the house relocation include rosin paper between the roofing and wood sheathing. One location was observed to be applied directly over the fiberboard sheathing/insulation.



Figure 2. Three plies of the roofing felt were identified to be saturated and partially separated with hot-applied asphalt waterproofing



Figure 3. In most areas the roofing assembly was installed directly onto the wood roofing substrate, photograph from the Visitor Center.

For all the BUR assemblies we recommend a full replacement of the roofing system and flashings which would include the following:

- Removal of the existing pea gravel
 - Note it may be possible to salvage and reuse portions of the existing pea gravel
- Demolition and removal of existing roof membrane
- Repairs or replacement of any damaged wood roof sheathing substrate
- Partial removal and storage of building horizontal and wood shingle sidings to expose vertical leg and attachment of flashings.
- Partial removal of lower fasteners for the vertical siding to expose vertical leg and attachment of flashings
 - Note that we also recommend an option to cut the bottom of the siding to increase the available room for vertical flashings to achieve industry standard vertical dimensions for flashing termination at the wall base. This recommendation is further outlined below (see **Wood Siding Transitions** section below)
- Removal of base of wall flashings.
 - Assessment and repairs to damaged building felt paper across the base of wall should be completed following removal of the flashings.
- Assessment of wood rafters
- Replacement of interior ceiling wood boards as necessary and where applicable

- Possible option for installation of high-density insulation cover board
- Installation of roofing assembly (See **Roofing Assembly System Options** in the section below)
- Installation of new counterflashing and kickout flashing
- Reinstallation of existing base of wall wood siding

Roofing Assembly System Options

The following options may be considered for replacement of the existing built-up roofing (BUR) assemblies. Note, no decision on the assembly option is needed at this time. The intent will be to include alternate assemblies in the documents and price both options as part of the bidding process. After receiving bids and information on lead times the Foundation may determine the best option based on this additional information.

Option 1 - In-Kind Replacement

Traditional BUR roof assemblies are more tolerant to zero slope configurations than modern roofing systems that industry standards recommend ¼ inch per foot minimum slope. Due to slope limitations based on available vertical flashing heights at rising walls, the first option consists of in kind replacement with a BUR system as follows:

- Rosin paper over the existing or new wood sheathing and wood boards
- Four-ply BUR assembly using hot asphalt
- Flood/mop coat of hot asphalt with pea gravel surfacing

Pros	Cons
<ul style="list-style-type: none"> ▪ In-kind replacement uses same system type as the historic residence has utilized over the years and appearance will be maintained ▪ Asphalt flood coat is applied monolithically, creating a seamless seals ▪ BUR systems provide historic long term performance with 25-30 year minimum lifespan with normal periodic maintenance ▪ Impact resistant due to pea gravel ballast protection layer ▪ UV resistant due to pea gravel ballast protection layer ▪ Low maintenance roof system and easily repaired if damaged 	<ul style="list-style-type: none"> ▪ Noxious fumes expelled during installation ▪ Hot asphalt applications will require fire-watch crews

Option 2 - Modified Bitumen Roofing Assembly

Our secondary recommendation for the replacement of flat roofs consists of a two-ply modified bitumen roof system with pea gravel surfacing. The assembly would be anticipated to include the following:

- Base layer mechanically attached to the sheathing

- The second layer can be adhered with hot roofing asphalt, cold-applied adhesive, by heat welding with torches, or by some combination of these methods
- Flood/mop coat of hot asphalt with pea gravel surfacing

<i>Pros</i>	<i>Cons</i>
<ul style="list-style-type: none"> ▪ Similar system to the existing system in that it features a multi-ply system with good redundancy and pea gravel ballast can be incorporated so that the appearance is similar to the existing ▪ Long-term performing system with 20-25 year minimum lifespan with normal periodic maintenance ▪ Redundant system with two membrane plies (base and cap sheet) ▪ Commonly available materials from numerous manufacturers ▪ Trained applicators widely available in Southern California 	<ul style="list-style-type: none"> ▪ Roof operations can provide offensive odors and care needs to be taken during re-roofing to protect intake vents, etc. ▪ System historically requires use of torches or hot mops for installation; however, other methods of installation, including cold fluid-applied adhesives, are available.

FIBERBOARD/INSULATION REPLACEMENT

Conference Room Patio

One of the roof cores completed at the patio end (north) of the conference room included the BUR assembly directly applied to the existing fiberboard sheathing/insulation.



Figure 4. Roof core created at the conference room, north. The roofing assembly was installed directly onto the insulation/fiberboard substrate. The roofing assembly was measured at approximately 1/2 inch.



Figure 5. The depth of the roof core location, including the roof assembly and substrate measured approximately 2-3/4 inches.

The extent of this condition, with the BUR directly applied to the fiberboard is unknown, however we anticipate is isolated to the exterior patio and possibly portions of the conference room.

This area will require modifications to include wood sheathing and assessment of the condition of the existing fiberboard.

Replacement of the existing fiberboards should be anticipated in this area.

Kitchen and Conference Room

Due to the existing water damage visible at the interior side of the fiberboard, it may be necessary to replace some of the existing damaged boards the following options may be considered:

- **Option 1:** Replace fiberboards as needed where damaged
 - Note extent of damage may not be visible until roof removal, the boards may be salvageable
- **Option 2:** Repaint interior side of fiberboards as needed where damaged (not an option if the fiberboard is also considered the roof deck and board must be planned for replacement in that scenario)
- Note procedures for handling asbestos containing materials are outside of WJE's scope. An environmental consultant would be required to be part of the team, as a sub-contractor to the general/roofing contractor or directly through the Foundation. The environmental consultant would assist with further defining procedures for removal and disposal of the existing fiberboard panels which are currently assumed to contain asbestos. WJE recommends the Foundation retain an environmental consultant to collect samples of the ceiling panels and other components at the roof level (i.e. roof mastics) to verify if they are asbestos containing materials. The information from the test results will help in selecting options for repair/removal and would allow for better accuracy in the repair documents with less unforeseen cost items.



Figure 6. Water damaged fiberboards near the kitchen skylights



Figure 7. Water damaged fiberboards in the conference room

WOOD SIDING TRANSITIONS

Performance and aesthetic considerations should be reviewed for transitions at the wood siding. As outlined above, the roof-to-siding transitions include interfaces at horizontal siding, wood shingles, and vertical siding.

- Generally, the transition details at the horizontal siding and shingles can be accomplished by removing the bottom sections of the siding in order to install the roofing counterflashing.
 - In some areas it may be necessary to increase the height of the roofing flashing vertical upturn, which would require eliminating some of the existing siding to provide more clearance.
- For the vertical siding, the design intent will be to have the boards remain in place with only localized removal of the bottom fasteners to allow for replacement of the base flashing.
 - Note, that some areas may require cutting a portion of the bottom of the existing vertical boards to allow the roof sufficient vertical upturn.
 - Pending modifications including the addition of insulation the extent of the portions to be cut would vary. We anticipate the modification to the boards would range from 2-6 inches of removal at the bottom of the board.
- **Recommended Option 1:** Cut a portion (2-6 inches) of the bottom of vertical boards and modify horizontal siding and shingles as necessary to allow for increased vertical upturn of the roofing assembly. These modifications may have some minor aesthetic changes to the exterior, however, would mostly not be visible from grade or most vantage points. The added height for the vertical transition of the roofing will enhance the roofing performance and assists with protection of the perimeter walls. WJE recommends this approach from a functional perspective as industry standards recommend an 8 inch minimum vertical flashing height be provided. Providing industry standard recommendations brings more reliability in performance and reduced risk of infiltration problems.
- **Option 2:** Maintain the current elevations for roofing terminations with minimal to no modifications to the wood siding. WJE recommends against this option due to lower reliability in performance and increased risk of infiltration problems.



Figure 8. Vertical siding with minimal clearance at the Workshop 1 West Addition

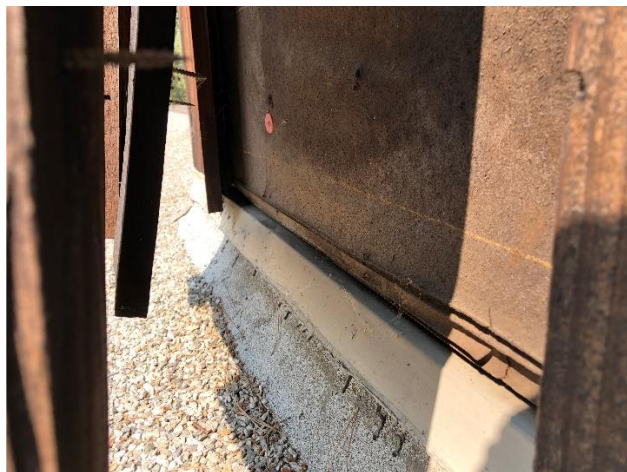


Figure 9. Location where vertical board bottom fasteners are withdrawn showing that enough room is available with bottom fasteners removed to replace base flashings.



Figure 10. Horizontal siding with very little clearance at the Visitor Center/Gift Shop



Figure 11. Shingle siding with minimal clearance at the Main House (east)

METAL ROOFS REPAIR & REPLACEMENT OPTIONS

For the existing shed slope metal roofs there are three possible options available for replacement.

Option 1 - In-Kind Replacement

This option would maintain the trapezoidal/corrugated rib pattern matching the existing profile and exposed fastener configuration. Modifications from the existing design would include:

- Modification of skylight detailing, including the addition of crickets at the high-side of the roof in accordance with NRCA guidelines
- Addition of insulation
- Modifications at transitions to wood siding

Items to consider for this option:

- NRCA recommends a minimum 3:12 slope for all architectural metal panel roof systems. The existing slope for the shed roofs is below industry standard for a metal roof system. Metal roofs that are sloped below NRCA guidelines are more vulnerable to water infiltration.
- It is recommended that exposed roofing fasteners are diligently replaced when neoprene gaskets deteriorate due to ultraviolet light (typically around 10 years). Because of the low slope of these roofs, fastener condition becomes of greater importance.
- This replacement is an in-kind replacement and therefore would appear similar to the existing



Figure 12. Existing metal panel roof profile



Figure 13. Current view of Workshop 2 metal roof perimeter from walkway level

Option 2 - Alternate Metal Roofing – Standing Seam

This option would include replacement of the metal panel roofs with a standing seam metal roof.

Modifications from the existing include:

- Modification of skylight detailing, including the addition of crickets at the high-side of the roof in accordance with NRCA guidelines
- Addition of insulation
- Modifications at transitions to wood siding

Items to consider for this option:

- The new roof would modify the aesthetic appearance of the roof profile. However, other newer roofs at the complex include a standing seam profile.
 - Note, from our most recent survey the sight lines for the metal roofs to be replaced are limited from public walkways at the perimeter of the complex. Particularly, there are limited to no vantage points where the metal roofs for Workshop 1 and 2 are visible. The master bathroom roof has some limited visibility from the Education Center.
- Although standing seam roofs offer better reliability in moisture control than trapezoidal roofs because fasteners are concealed, the low pitch of the roofs is still below NRCA guidelines for metal panel roofing. Therefore, standing seam roof options, like trapezoidal roof options, are more vulnerable to infiltration due to the low slope.
- The standing seam metal roof would have a higher cost than the simulated metal roof option below, and a marginally higher cost than the in-kind replacement with the corrugated metal panels.



Figure 14. Existing standing seam metal roofs at the Maloof complex



Figure 15. Standing seam metal roof, sample profiles

Option 3 - Alternate Material – Single-Ply Roofing

The basis-of-design for this option would include an adhered single-ply PVC roofing membrane. Due to both metal roofing systems being below NRCA design guideline standards, a single-ply roofing system can be designed to meet NRCA design guideline standards meaning this system type would provide better reliability from a performance standpoint. Because of the very limited visibility of these roof areas from elsewhere on the complex, this appears to be a good option for consideration in these cases. Single ply roofing would provide cost savings that could be dedicated toward other facets of the repair project. If desired single-ply roofing systems offer faux standing seams, such as Sika Décor. Décor faux seams can be hot-air welded to the continuous underlying PVC roof membrane to achieve a simulated standing seam appearance. However, as noted above, these roof areas are largely sheltered from visibility throughout the site and complex and seams would require additional cost that may not be necessary (though minimal).

System modifications from the existing include:

- Addition of insulation with this option is easier to implement due to reduced system thickness of the single ply roofing
- Cricket design can be easily accomplished with tapered insulation at the up-slope side of skylights
- Modifications at transitions to wood siding
- More flexibility with detailing at penetrations and other transitions

Items to consider for this option:

- T Different appearance from the metal roof systems, though PVC membrane comes in multiple colors including a standard gray color that is relatively similar to the existing gray metal roof color. However, visibility of the roofs to be replaced is limited.
- Seams are minimal with single ply roofing and seams that are required are hot air-welded and are reliable
- Single ply roofing can perform effectively with regard to the available roof pitch slopes



Figure 16. PVC roof membrane with Décor strips added to simulate standing seam metal roof



Figure 17. Custom colored PVC membrane with Décor strips.

Metal Panel Roof Options Summary

Neither of the two metal options meet NRCA guidelines for slope requirements, therefore from a functional perspective an alternate material such as PVC or other single ply roofing membranes is recommended that can perform with the available roofing slopes to achieve more reliable long-term performance. After review of project site lines, we determined that the specific low-slope shed roof areas to be replaced have very limited visibility. Therefore, the use of alternate materials on these specific roof areas appears to have very limited effect on appearance. Use of single ply roofing as an alternate material would bring improved function performance that would minimize maintenance efforts and bring lower cost.

INSULATION CONSIDERATIONS

The following outlines information on the required roof assembly inclusions from the current building code standards in the 2019 CBC code requirements: Installation of polyisocyanurate insulation

- Per the currently adopted 2019 California Building Standards Code, Part 6 California Energy Code Chapter 8, a continuous roof insulation of R-8 is required above roof decks for the climate zone 10. However, the code allows variances on existing buildings, specifically historic buildings, in which installation of new and additional insulation to meet code requirements is not immediately achievable due to surrounding as-built conditions related to flashing height, etc. (if additional repair costs would be burdensome).

Metal Roofs

- For metal roofs, it may be possible to add sufficient insulation above the roof deck to meet the code requirement.
 - Note, there is also batt insulation on the interior side of the roof at Workshop 1.
- Modification of the skylight curbs would be necessary to accommodate the new insulation (raising the curb height and skylights).

-
- Note, modification of the skylights would be necessary for drainage detailing, regardless if insulation is added.
 - With the alternate material roof option with single-ply PVC roofing, adding insulation and cover board to meet code requirements is relatively easier due to the reduced system thickness.

Flat Roofs

- For flat roofs the addition of a 1-inch-thick layer of polyisocyanurate insulation and a 1/2-inch thick high density polyisocyanurate cover board would increase the conditioned space's resistance to conductive heat loss above the code minimum value of R-8.
 - One inch of polyisocyanurate insulation can provide approximately an R-value of 5.6 based on NRCA design guidelines for a cooling climate
 - The 1/2-inch thick high density polyisocyanurate cover board provides an R-value of 2.8
- As with any changes to the former roof assembly, alterations will be required at interfacing roof projections to accommodate the thickened assembly. Modifications to base of wall flashings, edge flashings, window flashings, skylight flashings, and roof penetrations would be necessary. These changes may mildly impact appearance.
- Addition of insulation may have a bigger impact at areas with clerestory windows. We do not recommend reducing flashing heights adjacent to windows, especially where available flashing heights are already well-below NRCA recommendations of 8-inches. If insulation is added near these windows, it may trigger requirement of repositioning windows, which would have a noticeable visible impact and would increase construction scope and cost.

Option 1: Maintain Existing Insulation Conditions

Note that since the building is a historic existing building, and that as-built conditions do not readily allow installation of additional insulation without requiring unnecessarily burdensome additional repairs to accommodate the insulation, a code variance is applicable that avoids the requirement to upgrade to an R-value of 8. Due to limiting existing conditions, if you would like to maintain the current condition with no insulation, we would recommend pursuing a variance from current requirements of the CBC. This variance is possible by provisions in the California Existing Buildings Code.

We have tentatively assumed that this is the preferred approach because of the number of modifications that would be needed to accommodate the additional insulation, and the additional cost that would also apply.

Option 2: Localized Insulation Modifications

- At roof areas without obstructions, or restricted vertical flashing clearance heights, additional insulation will be added to meet current code requirements. This generally includes the metal roofs being replaced.
- Avoid addition of insulation at areas around clerestory windows and other conditions that would significantly alter the building's cladding and envelope conditions.
- Modify skylight curbs (two skylights at kitchen) to accommodate added insulation

- The addition of localized insulation will still require a variance from meeting all of the roof replacement code requirements. This variance is possible by provisions in the California Existing Buildings Code.

REPAIR CONSIDERATIONS

Per our discussion with the Foundation, WJE recommends that the foundation budget for routine and periodic maintenance program at all roof areas. This includes periodic visual inspection of all roof areas by a qualified roofing contractor along with isolated repairs as necessary to maintain the condition of the roofing to achieve long term performance. In addition, and specifically, we have discussed the condition of existing trapezoidal metal roofs with exposed fasteners. Since the exposed neoprene washers breakdown due to exposure to ultraviolet life, it is recommended that fasteners are replaced as gaskets deteriorate over time (+/- 10 years anticipated).

CLOSING

WJE is available to discuss the roof system options and limitations outlined in this memorandum to help the Board evaluate the options and move forward with a design approach.

APPENDIX – ADDITIONAL PHOTOGRAPHS



Figure 18. Aerial image of complex with flat roofs shown to be replaced with dashed red boundary lines and metal roofs to be replaced with magenta dashed boundary lines. Roofs with yellow dashed boundary lines are currently designated as alternate roofs for consideration of replacement based on poor insulative performance.



Figure 19. Example at rising wall with vertical siding and limited vertical flashing height below industry standard recommendations. This area is largely unseen from elsewhere on site.

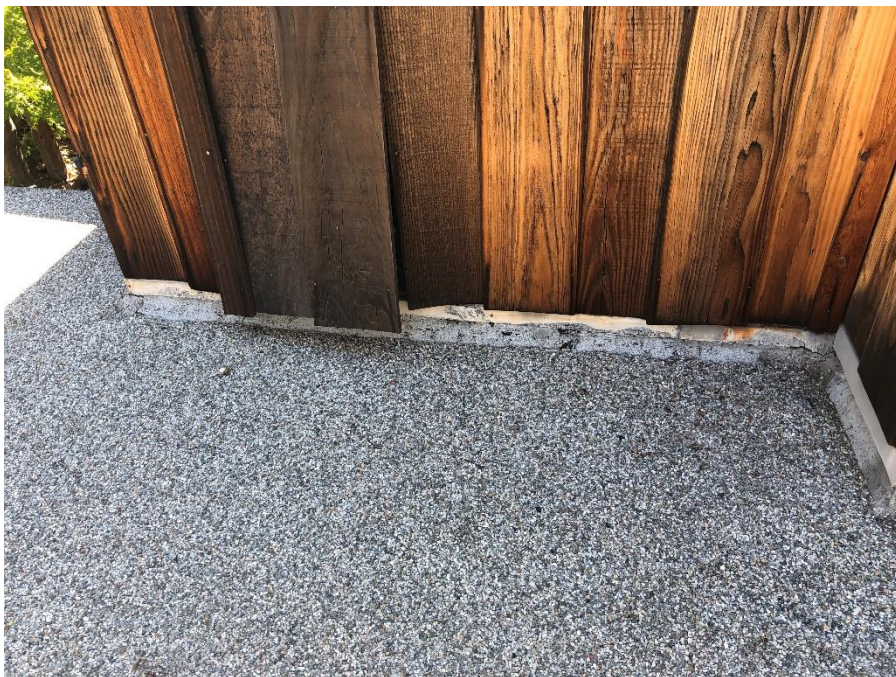


Figure 20. Example at rising wall with vertical siding and limited vertical flashing height below industry standard recommendations. This area is largely unseen from elsewhere on site.



Figure 21. Example at rising wall with window and shingle cladding along with limited vertical flashing height below industry standard recommendations.



Figure 22. Example at rising wall with window and shingle cladding along with limited vertical flashing height below industry standard recommendations.



Figure 23. Example of very little available flashing height below existing window.



Figure 24. Example of very little available flashing height below clerstory window.



Figure 25. Example of very little available flashing height below existing window and shingle cladding.



Figure 26. Example of very little available flashing height at skylight.



Figure 27. Example of low slope at Workshop 1.



Figure 28. Example of typical low visibility of metal roofing from grade.