Ventura County Cultural Heritage Board Agenda
Monday, February 11, 2013

County of Ventura · Resource Management Agency · Planning Division
800 S. Victoria Avenue, Ventura, CA 93009-1740 · (805) 654-2478 · ventura.org/rma/planning

Notice is hereby given that on Monday, February 11, 2013; the Ventura County Cultural Heritage Board will convene at 1:15pm to hold a public hearing at the Ventura County Government Center, Administration Building, Third Floor, Santa Cruz Conference Room (a.k.a. Room 311) located at 800 S. Victoria Avenue, Ventura, CA. Members of the public are welcome to attend.

1. ROLL CALL

Patricia Havens, Ricki Mikkelsen, John Kulwiec, Don Shorts, Gary Blum, Stephen Schafer, and Miguel Fernandez

2. ORAL COMMUNICATIONS

Discussion is limited to items not on this agenda which are within the purview of the Board. Each speaker is allowed 5 minutes. Board may question the speaker but there will be no debate or decision. Staff may refer the matter for investigation and report.

3. APPROVAL OF MINUTES

October 08, 2012 Minutes

4. CONVENE THE MEETING OF THE OXNARD CULTURAL HERITAGE BOARD

a) Landmark No. 161 - Legalize Garage Conversion and Installation of a Garage Door at 121 S G Street, Oxnard.
Action: Consider Request for a Certificate of Appropriateness to install a new garage door, reconvert 50% of the after the fact garage conversion back to a garage and retain the remaining garage conversion to habitable space.

5. CONVENE THE MEETING OF THE VENTURA COUNTY CULTURAL HERITAGE BOARD

a) Santa Clara Valley Phase IV Survey Area - Proposed Demolition and New Construction at 993 Riverside Avenue, Bardsdale – Site of Merit
Action: Consider Request for a Certificate of Review to remove a 235 square foot single story master bedroom and construct a two-story addition

b) Landmark No. 172 – Proposed Phase 3 Renovation of the Agricultural Commissioner's Office Building at 815 and 845 East Santa Barbara Street, Santa Paula.
Action: Consider Request for a Certificate of Appropriateness for window replacement, HVAC system installation, roof structure upgrade and proposed signage

6. DISCUSSION

a) Board Discussion

In Compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact Nicole Doner at 805-654-5042. Reasonable advance notification of the need for accommodation prior to the meeting (48 hours advance notice is preferable) will enable us to make reasonable arrangements to ensure accessibility to this meeting.

b) Staff Comments

7. MEETING ADJOURNMENT

In Compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact Nicole Doner at 805-654-5042. Reasonable advance notification of the need for accommodation prior to the meeting (48 hours advance notice is preferable) will enable us to make reasonable arrangements to ensure accessibility to this meeting.

Ventura County Cultural Heritage Board Minutes
October 08, 2012 at 1:15p.m.

County of Ventura • Resource Management Agency • Planning Division
800 S. Victoria Avenue, Ventura, CA 93009-1740 • (805) 654-2478 • ventura.org/rma/planning

1. Meeting was called to order at 1:15pm by Vice Chair Shorts due to the absence of Chair Blum
Commissioners Present: Patricia Havens, Ricki Mikkelsen, Don Shorts-Vice Chair, Gary Blum - Chair, Stephen Schafer John Kulwiec and Miguel Fernandez
Chair Blum came in at 1:45pm
Staff Present for meeting: Nicole Doner, Tricia Maier

2. Oral Communications
None. No members of the public attended.

Items taken out of order

4. Convene the Meeting of the Ventura County Cultural Heritage Board (VCCHB)

4a. Santa Clara Valley Phase IV Survey 1987, Site of Merit, 697 Church Street, Piru, CA, CH12-0018, Consider a Certificate of Review for interior and exterior remodel of existing residence.

Nicole Doner, staff, presented the staff report and the following recommended actions:

1. CONDUCT public hearing, hear testimony, and CONSIDER the staff report; and
2. FIND that the improvements meet the requirements of the County Cultural Heritage Ordinance and the Secretary of Interior's Standards; and
3. Based on the preceding evidence and analysis, APPROVE a Certificate of Review for the proposed improvements.

Presentation of public speakers: Jane Carroll, representative of the property owners, was asked to provide additional information regarding the fireplace and roof opening when the fireplace is removed. Ms. Carroll stated that they planned roof repair once the fireplace is removed and planned to leave the asbestos siding intact.

VCCHB's Disclosures: None

VCCHB Deliberation and Vote: Mr. Schafer motioned to approve the Certificate of Review based on the list of alterations in the staff report except for the two front porch doorways which will remain in place as doors. Fernandez seconded the motion. Motion passed 7-0.

Vice Chair Shorts vacated the chair to Chair Blum on his return.

4b. Santa Clara Valley Phase V Survey 1996, Site of Merit, 12738 Telegraph Road, Santa Paula, CA, CH12-0017
Consider a Certificate of Review to remodel two residences on an existing 19 acre agricultural site which is designated a Site of Merit.

Nicole Doner, staff, presented the staff report and the following recommended actions:

1. CONDUCT public hearing, hear testimony, and CONSIDER the staff report; and

2. FIND that the exterior improvements except for the proposed replacement siding and water heater replacement do not meet the requirements of the County Cultural Heritage Ordinance; and

3. FIND that the interior improvements except for the proposed electrical re-wiring and re-arrangement of plumbing fixtures and reconfiguration of a bathroom wall within Building A do not meet the County Cultural Heritage Ordinance; and

4. Based on the preceding evidence and analysis, APPROVE a Certificate of Review for the proposed replacement siding, water heater replacement, re-arrangement of plumbing fixtures, reconfiguration of a bathroom wall and electrical re-wiring only.

Presentation of public speakers: Terrell Cryer, designer and Jerry Martinez, representatives of the property owners were requested to provide clarification on the COR request.

VCCHB's Disclosures: None

VCCHB Deliberation and Vote: Mr. Schaefer stated that Building A built in 1935 was the historically significant building on the property based on its integrity.

Mr. Fernandez motioned to approve the COR for the project as proposed with the condition that the applicant maintain existing wood windows on the three walls that comprise the most historically significant portion of Building A (visible in Item 4b Exhibit), if possible to reuse existing salvaged vertical siding as replacement boards to use on Building A's significant three walls, removal of the non-working door and small closet window on third wall and replace with siding, otherwise the Board endorses the plan to use plywood board and battens matching as stringently as possible the existing finish of the existing board siding and the board endorses the removal of the fireplace in Building B.

Ms. Havens seconded.
Motion carried 7-0.

3 Minutes:
February 13, 2012 Minutes- *Approved by consensus with stand-asides by Mr. Kulwiec, Ms. Havens and Ms Mikkelsen*
April 23, 2012 Minutes - *Approved by consensus with stand-asides by Ms. Havens and Ms. Mikkelsen*
June 11, 2012 Minutes - *Approved by consensus with stand-asides by Mr. Kulwiec, Ms. Havens and Mr. Schafer.*
June 25, 2012 Minutes - *Approved by consensus with stand-asides by Mr. Kulwiec, Ms. Havens and Mr. Schafer.*

5. Discussion
a) Jose Moreno, RMA GIS Department staff to present the County Historical Landmarks Interactive Map to the Cultural Heritage Board

b) Proposed National Preservation Banner
Recommendation:
Review and provide comments on proposed design. Comments made by board members:
- Use a photo of the Faulkner House, as the first landmark in the County. Create a separate banner strip with "May is National Historic Preservation Month" to add to the main banner during the month of May.
- Four banner pictures created to change out every week.
- Add website on the banner.

c) Board comments

6. Adjournment of the Meeting of the Cultural Heritage Board by Chair Blum.

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Oxnard Cultural Heritage Board
Staff Report and Recommendations
Agenda of February 11, 2013, Item 4a

County of Ventura · Resource Management Agency · Planning Division
800 S. Victoria Avenue, Ventura, CA 93009-1740 · (805) 654-2478 · ventura.org/rma/planning

SUBJECT:

Landmark No. 161, 121 South G Street, Oxnard, Request for a Certificate of Appropriateness to install a new garage door, reconvert 50% of the after-the-fact garage conversion to a one-car garage, and retain the remaining 50% of the garage conversion for habitable space.

APPLICANT

Larry Graves, Architect
2105 Hyland Avenue
Ventura, CA 93001

OWNER:

Elsi Escalante Trust
c/o Becker Group
814 Canada Street
Ojai, CA 93023

REQUEST:

The applicant is requesting a Certificate of Appropriateness (COA) to install a new garage door facing the alleyway, reconvert 50% of the after-the-fact garage conversion to a single car garage, and retain the remaining 50% of the garage conversion for habitable space.

LOCATION AND PARCEL NUMBER:

121 South G Street, Oxnard, CA/APN: 202-0-030-410

BACKGROUND:

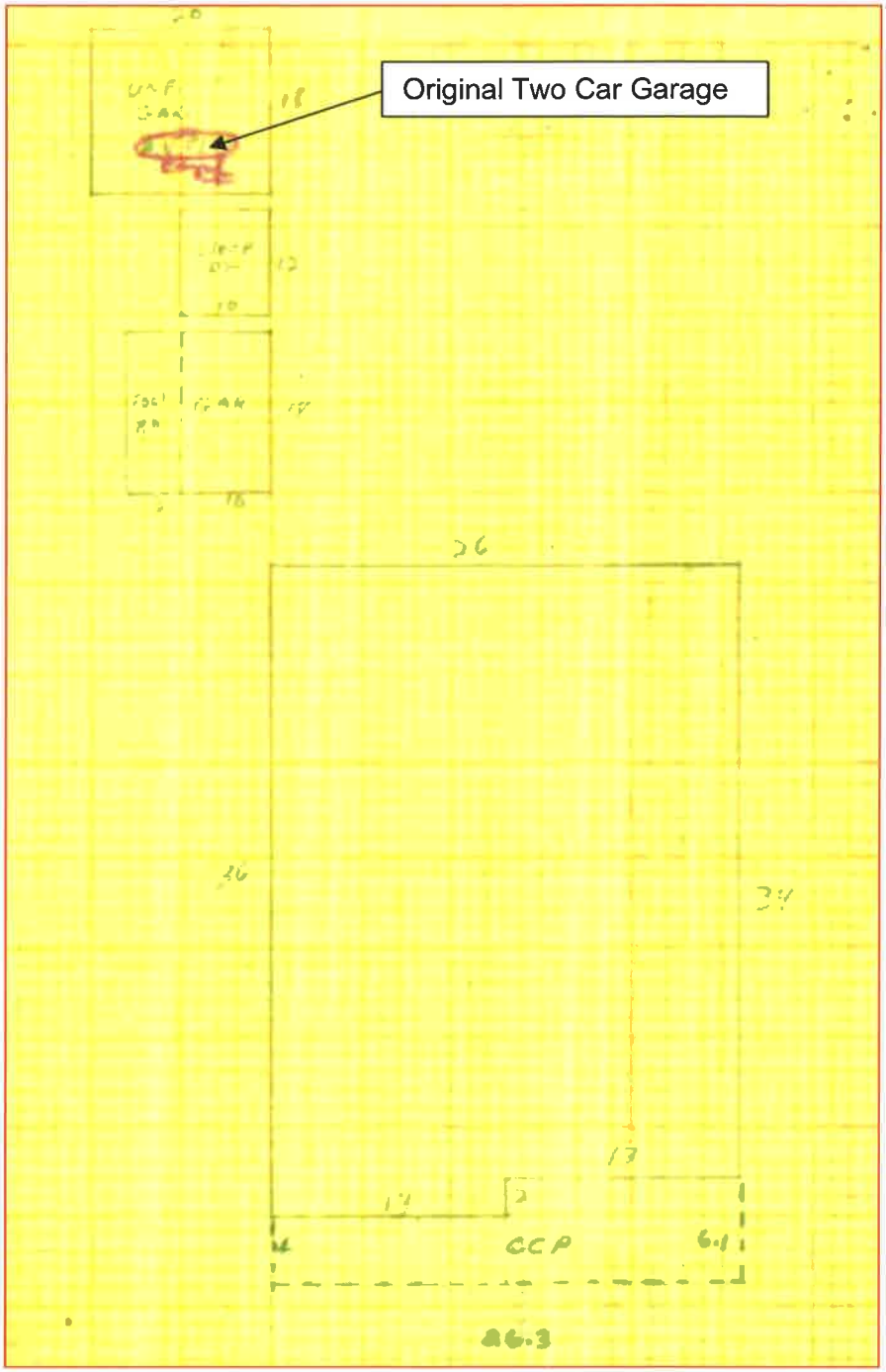
In 1980, the County of Ventura commissioned a cultural heritage survey which included this area and this house. The Oxnard City Council established the Oxnard Historic Landmark Area subsequently on F and G Streets. The area is listed as a Historic District on the National Register of Historic Places. (Oxnard Survey, F St., DPR, 1981).

The 1925 Mediterranean style single story residence was built for Harry W. Johnson who was the Chief of Police for the City of Oxnard from 1926 to 1929 and later became the City Tax Collector. The residence has two bedrooms and one bathroom of approximately 910 square feet. The front porch has been added sometime in the 1960s-70s with three arches on the front (see 1951 and 2013 photos – next page). None of the original windows exist – vinyl side windows and wood picture windows on

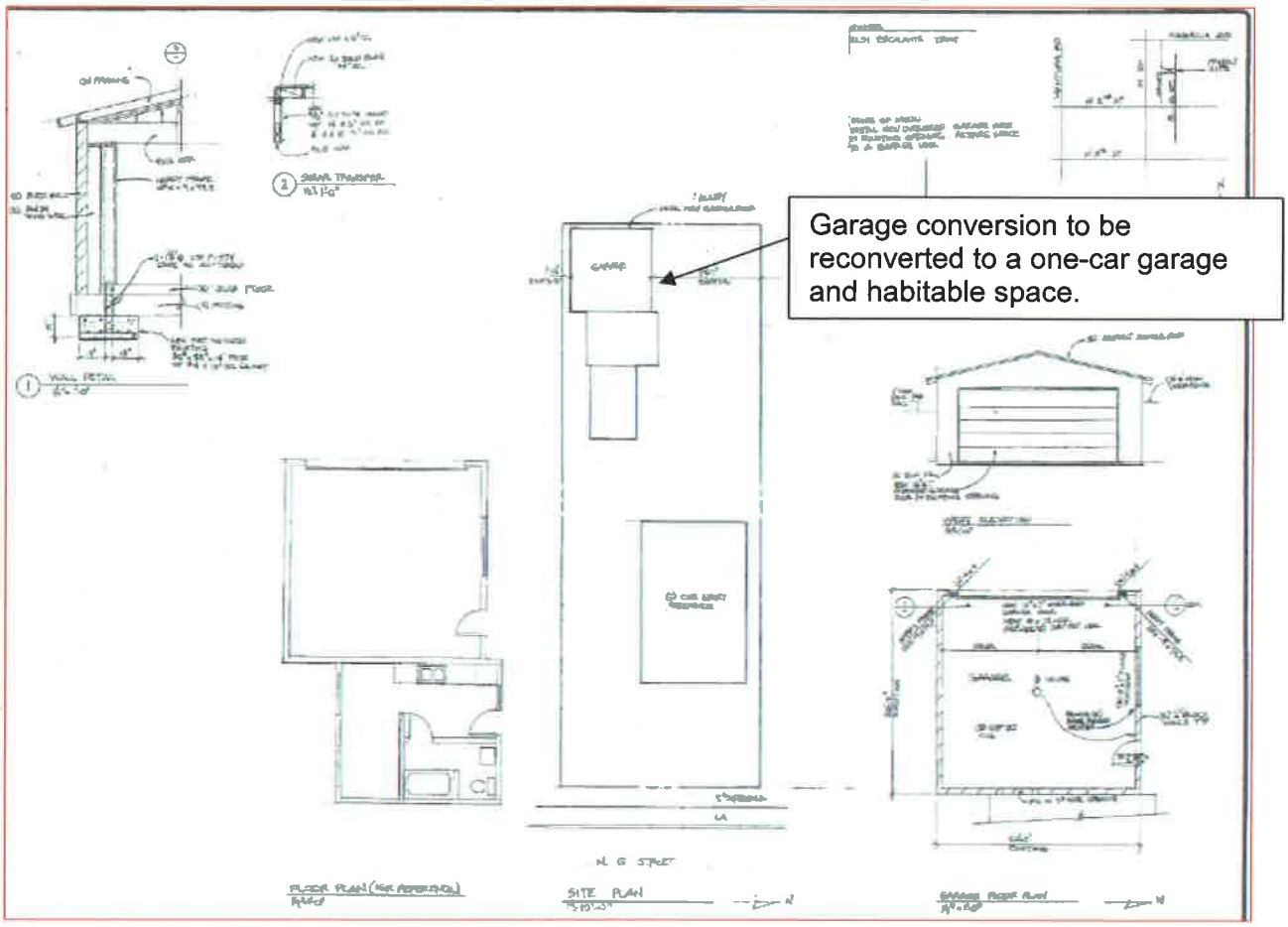
the front. A concrete front driveway leads to the circa 1925 single-car garage of 180 square feet that has a flat roof. Another structure built in 1946 faces the alleyway and consists of a simple, flat-roofed rectangular box (made of concrete block) of 400 square feet. The lot is 50 feet wide by 140 feet long.

121 S G St. Photo Taken in 1952

121 S G St. Photo Taken in 2013.



1951 Site Plan from the Assessor Records



Proposed Site Plan

2011 Photo taken from the Alleyway of subject property

PROJECT ANALYSIS

- Remove a portion of the 1946 garage's exterior wall fronting the alleyway in order to install a steel sectional rollup garage door in the building (see Exhibit 1- Elevations).
- Remove 50% of the illegal conversion of the structure back to a garage to hold one vehicle.
- Remove the storage shed on the south side of the original 1925 garage.
- Any improvements made as part of the illegal conversion to the remaining 50% of the 1946 structure shall be legalized.

The Significance of the New Construction and the Secretary of the Interior's Standards and Guidelines for the Treatment of Historic Properties (the Standards) Review

As required by the Cultural Heritage Ordinance, the Standards have been used to review this project and the Cultural Heritage Board's (the Board) review must be based on consistency of the project with them. The Standards are used to determine if the work respects its historic features.

Specifically, Standards 9 and 10 apply to new construction:

9. *New additions, exterior alterations, or related new construction shall 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.*

Staff Comment: The original structure was constructed in 1946 as a two-car garage (20' x 20' width per Building permit #5222-B). Most of the garages/ garage doors in the adjacent area have been altered and replaced with more contemporary doors and garages (Exhibit 2). Although the existing structure was not constructed in the period of significance, the new garage door should be compatible with the historic district and alleyway/streetscape. Therefore, only one recommendation is given for the project to be more compatible with the historic district:

- A metal/steel sectional rollup door is not generally appropriate in the historic district, but if used, the door should be painted/coated using in a neutral tone that is compatible with the house.

Cultural Heritage Ordinance

In taking the steps noted above your Board must also make the specific Ordinance finding which logically follows to approve or deny the project.

For **approval** the following finding must be made:

Section 1366-3(a) states: "*The proposed work will neither adversely affect the significant architectural features nor adversely affect the character of historical, architectural or aesthetic interest or value of the Cultural Heritage site.*"

OR For **denial** one or both of the following findings must be made:

Section 1366-7(a) states: "*The proposed project is to remove or demolish a Cultural Heritage site that is determined by the Cultural Heritage Board to be significant and important to the history of the County.*"

PUBLIC COMMENTS

No public comment regarding this application has been received

RECOMMENDATION ACTIONS:

1. Conduct public hearing and hear testimony;

2. Find the project proposal of the reconversion of the after-the-fact garage conversion by installing a garage door and retaining 50% of the remaining garage conversion as habitable space is consistent with the Standards and the Cultural Heritage Ordinance as long as the metal door is painted/coated using a neutral color.

3. Based on the preceding evidence and analysis, Staff recommends that your Board make Ordinance findings by motion based on the evidence presented, to approve the COA for the project with the recommendation that the doors would be painted or coated in a neutral color.

The owner must be given the opportunity to plead economic hardship as provided by Ordinance Section 1366-3.(d). The Cultural Heritage Board's action will be final unless appealed to the Oxnard City Council within 15 days of notification of the decision (Section 1366-7.c).

Prepared by:

Nicole Doner

Nicole Doner, Senior Planner
805-654-5042

Attachments:

Exhibit 1: Site Plan/Elevation
Exhibit 2: Photos of Adjacent G Street Garages

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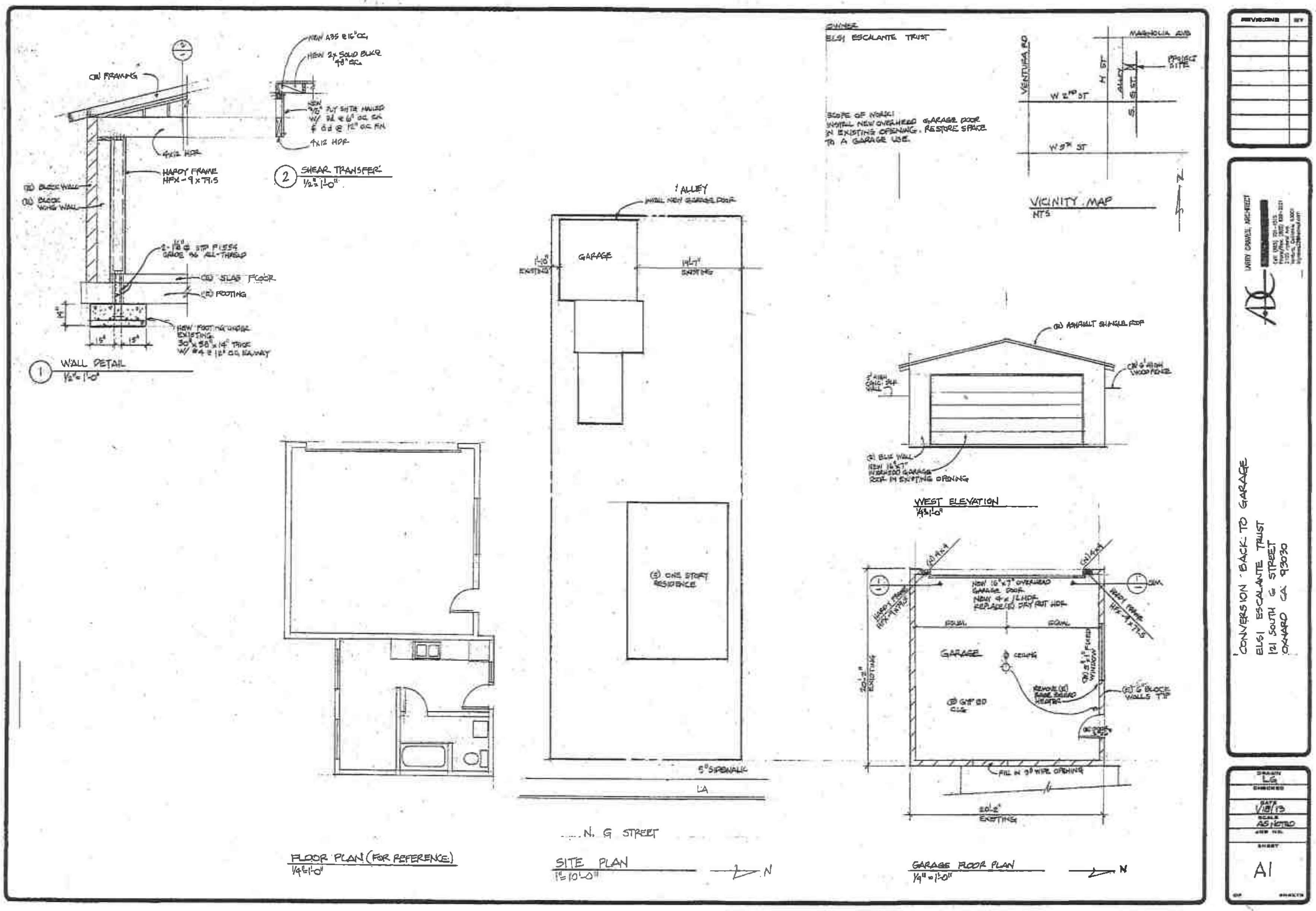
EXHIBIT 1



WALL DETAIL
1/2" = 1'-0"
HARDY FRAME
SHEAR TRANSFER
1/2" = 1'-0"
OWNER
ELSI ESCALANTE TRUST
SCOPE OF WORK:
INSTALL NEW OVERHEAD GARAGE DOOR IN EXISTING OPENING. RESTORE SPACE TO A GARAGE USE.
VICINITY MAP
NTS
VENTURA RD
MAGNOLIA AVE
PROJECT SITE
W 2ND ST
W 3RD ST
ALLEY
GARAGE
EXISTING
(E) ONE STORY RESIDENCE
5' SIDEWALK
N. G STREET
WEST ELEVATION
1/4" = 1'-0"
GARAGE
EXISTING
FLOOR PLAN (FOR REFERENCE)
1/4" = 1'-0"
SITE PLAN
1" = 10'-0"
GARAGE FLOOR PLAN
1/4" = 1'-0"
N
CONVERSION BACK TO GARAGE
ELSI ESCALANTE TRUST
121 SOUTH G STREET
OXNARD CA 93030
LARRY GRAVES, ARCHITECT
A1

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EXHIBIT 2


ROB'S PLUMBING
WHOLE HOUSE SPECIAL
EVERY DRAIN IN HOUSE
CLEANED WITH A 1 YEAR
GUARANTEE FOR $100
CALL 223-5588

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Staff Report and Recommendations
Agenda of February 11, 2013, Item 5a

County of Ventura · Resource Management Agency · Planning Division
800 S. Victoria Avenue, Ventura, CA 93009-1740 • (805) 654-2478 • ventura.org/rma/planning

SUBJECT:

Santa Clara Valley Phase IV Survey area, 993 Riverside Avenue, Bardsdale Community, Request for a Certificate of Review to remove 235 square feet of structure and construct a two-story addition to existing one-story residence, Project No. CH13-0001

APPLICANT:

Tim Wallace
PO Box 6152
Ventura, CA 93006

OWNER:

Steven A and Dina Reisman Trust
993 Riverside Avenue
Fillmore, CA 93015

REQUEST:

The applicant is requesting approval of a Certificate of Review to remove an existing 235 square foot one-story flat roofed master bedroom and construct a two-story addition to a Victorian-era farmhouse which is designated a Site of Merit in the Bardsdale Community.

LOCATION:

993 Riverside Avenue, Bardsdale Community, CA/ APN 046-0-110-085

BACKGROUND:

Historical Background

The 1987 Santa Clara Valley Survey Phase IV surveyed the Bardsdale Community and recognized the subject property as a historic resource with a National Register of Historic Places Status Code rating of 3D ("eligible for National Register listing"). The community of Bardsdale was laid out in 1887 by real estate developer Roys G. Suydam and named for his friend, Thomas Bard. Although never accomplished, the Survey's evaluation committee recommended that the entire Bardsdale community be declared a historic district.

The Victorian-era (turn-of the century) single-story farmhouse has a modified L-shape surrounded by a raised wood deck on two-thirds of the perimeter of the house. The residence contains three bedrooms and 1.5 baths of approximately 1,488 square feet. According to the property owner's designer, the existing residence has had a series of room additions and covered porch enclosures over the years. The County has no

record of building permits having been issued for improvements to the house other than an electrical permit.

The existing farmhouse has retained most of its exterior integrity based on the existence of narrow windows, roof lines, and wide shiplap type siding. However, the master bedroom, raised redwood decks, and the laundry/mud room that contain aluminum sliding windows, vinyl single hung windows and contemporary French doors appears to have been added in the last 50 years. An existing garage was built sometime between 1900 and 1954. Since 1954, the existing garage has been added onto and now connects to the rear of the house.

PROJECT ANALYSIS

Below are the proposed improvements at 993 Riverside Avenue:

- Demolish 235 square feet of the one-story flat-roofed master bedroom on the north elevation. The existing master bedroom appears to be an addition constructed sometime after 1954 based on the County Assessor's records.

- Construct a two-story addition of 990 square feet in the same general location as the master bedroom with the following proposed details:

    - 643 square foot first floor addition to be used as a family room with a pre-manufactured fireplace and closet underneath stairs.

    - The original rear bathroom windows (fixed center panel and the two side casement panels) located on first floor will be removed, framed in and a ceiling fan will be installed.

    - Original bedroom #2's double hung wood window will be removed and framed in.

    - Dual-glazed aluminum-clad wood-framed French doors are proposed on the North Elevation of the first floor and second floor additions and dual-glazed aluminum-clad wood framed single hung windows are proposed on first floor's East elevation and dual-glazed aluminum clad wood framed casement windows on the second floor's East elevation.

    - Wood-framed interior stairs with a 2-inch diameter wood handrail on each side of the stairs to the second floor.

    - Exterior first floor raised deck to be located on the North Elevation

- 347 square foot second floor addition to be used as a master bedroom with a second floor balcony (using Dex-O-Tex Weatherwear decking system) that would align with the existing residence's downstairs bath.

- Composition roof tile by Certainteed – Presidential Shake in Autumn Blend

- Exterior Air Conditioning Unit/Condenser proposed at an unknown location.

Secretary of the Interior Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings (The Standards) and Ventura County Cultural Heritage Ordinance Provisions and Findings:

As required by the Cultural Heritage Ordinance, the Standards have been used to review this project and the Cultural Heritage Board's (the Board) review must be based on consistency of the project with them. The Standards are used to determine if the work respects its historic features.

Specifically, Standards 9 and 10 apply to new construction:

9. *New additions, exterior alterations, or related new construction shall 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.*

Building Exterior:

- *Identifying, retaining and preserving wood features that are important in defining the overall historic character of the building such as siding, cornices, brackets, etc…..(p. 71)*

Building Interior:

- *Identifying, retaining and preserving a floor plan or interior spaces. (p. 94)*

- *New additions, exterior alterations, or related new construction shall 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. (p. vii – Standards #10)*

Windows:

- *Identifying, retaining and preserving windows and their functional and decorative features.*

New Additions to Historic Buildings:

- *Locating the attached exterior addition at the rear or on an inconspicuous side of the historic building and limiting its size and scale in relationship to the historic building.*
- *Designing new additions in a manner that makes clear what is historic and what is new.*

Staff Comment:
According to the project description (attached as Exhibit 1):

> *The house will have consistent detailing and finishes matching the existing residence. The massing and roofline will be consistent with the existing residence and the roof pitch will match the existing, and will be no higher than the existing roofline. The addition will setback from the front of the existing residence and will align with the existing wing to the east.*

Building Exterior:
The applicant informed staff that the new addition's siding will match the existing shiplap siding. Staff suggests that, if possible, the applicant reuse existing salvaged shiplap siding as replacement boards to use on the proposed addition. As described in the project description, the second story addition will be located to the rear of the property and the new addition will be the same height and scale of the existing historic building, therefore, the new second story addition would be consistent with the Secretary of Interior's Standards.

Building Interior:
The original floor plan will not be altered and no character-defining features are proposed to be removed or altered other than removal of one double hung window in Bedroom #2 for the new construction.

Windows/Doors:
Staff has suggested that the applicant consider re-using Bedroom #2's double hung wood window (proposed to be removed) in the proposed addition if possible. Staff has concerns that the aluminum-clad single hung windows in the new first floor family room and aluminum-clad wood framed casement windows on the new second floor master bedroom may not be compatible with the original double-hung windows in size, scale, and architectural features. The applicant will provide photographs of the proposed aluminum-clad window and aluminum-clad French door for Board review and approval. If the Board determines that the aluminum-clad (casement and single hung) windows/doors are not compatible with the existing wood windows/doors then staff

recommends that the applicant use solid wood-framed single hung windows and solid wood-framed doors.

Individual and Cumulative Effects- The Board must decide if the project components adversely affect the overall historic fabric of the site, and whether it, either individually or cumulatively, would diminish its historic character. The Standards indicate:

> *It should be remembered...that such loss of character is just as often caused by the cumulative effect of a series of actions that would seem to be minor interventions.(p. ix)*

Cultural Heritage Ordinance

In taking the steps noted above your Board must also make the specific Ordinance finding which logically follows to approve or deny the project.

For **approval recommendations,** the following finding must be made:

> Section 1366-3(a) states: "*The proposed work will neither adversely affect the significant architectural features nor adversely affect the character of historical, architectural or aesthetic interest or value of the Cultural Heritage site.*"

OR

For **denial recommendations,** one or both of the following findings must be made:

> Section 1366-7(a) states: "*The proposed project is to remove or demolish a designated Cultural Heritage site that is determined by the Cultural Heritage Board to be significant and important to the history of the County.*"
>
> Section 1366-7(b) states: "*The proposed project would adversely affect the historical significance of the site or would not be compatible with the use and/or exterior of the designated Cultural Heritage site.*"

PUBLIC COMMENTS

No public comment regarding this request has been received to date.

RECOMMENDATION ACTIONS:

1. CONDUCT public hearing, hear testimony, and CONSIDER the staff report; and

2. FIND that the improvements meet the requirements of the County Cultural Heritage Ordinance and the Secretary of Interior's Standards; and

3. Based on the preceding evidence and analysis, APPROVE a Certificate of Review for the proposed improvements with any Board recommendations determined necessary to conform to the Standards.

The Cultural Heritage Board's action will be final unless appealed to the Board of Supervisor's within 15 days of notification of the decision (Section 1366-7.c).

Prepared by:

Nicole Doner, Senior Planner
805-654-5042

Attachments:

Exhibit 1: Project Description
Exhibit 2: 1987 DPR 523 Form (Primary and Building, Structure and Object Records)
Exhibit 3: Existing Site Plan/floor plan outlining previous additions
Exhibit 4: Existing Site Plan/floor plan with photo index
Exhibit 5: Photos of Existing Site
Exhibit 6: Proposed Site & Floor Plans and Elevations

Reisman Residence Addition

Project Description

The Reisman residence addition is a 990 square foot addition to an existing farmhouse at 993 Riverside Avenue in Fillmore. The existing residence is a part of the Barnsdale Estates area of Fillmore. The existing residence was built at the turn of the century. It consists of 1488 square feet of interior area on a 9.31 acre site. The existing residence is surrounded by a raised wood deck on two thirds of the perimeter of the residence. The existing residence appears to have had a series of additions and/or covered porch enclosures over the years. Our project consists of removing an existing 235 square foot one story flat roofed master bedroom addition that is not consistent with the original architecture of the residence. We intend to replace the addition with a new addition of 643 square feet on the ground floor and 347 square feet on the second floor. The first floor will consist of a family room with an exterior raised deck and the second floor will be a master bedroom with an exterior deck. The decks are at the rear of the residence. The house will have consistent detailing and finishes to match the existing residence. The massing and roofline will be consistent with the existing residence. The roof pitch will match the existing and will be no higher than the existing roofline. The addition will setback from the front of the existing residence and will align with the existing wing to the east.

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State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

HABS ____ HAER ____ NR 3D SHL ____ Loc ____
A ____ C ____
B ____ D ____

IDENTIFICATION

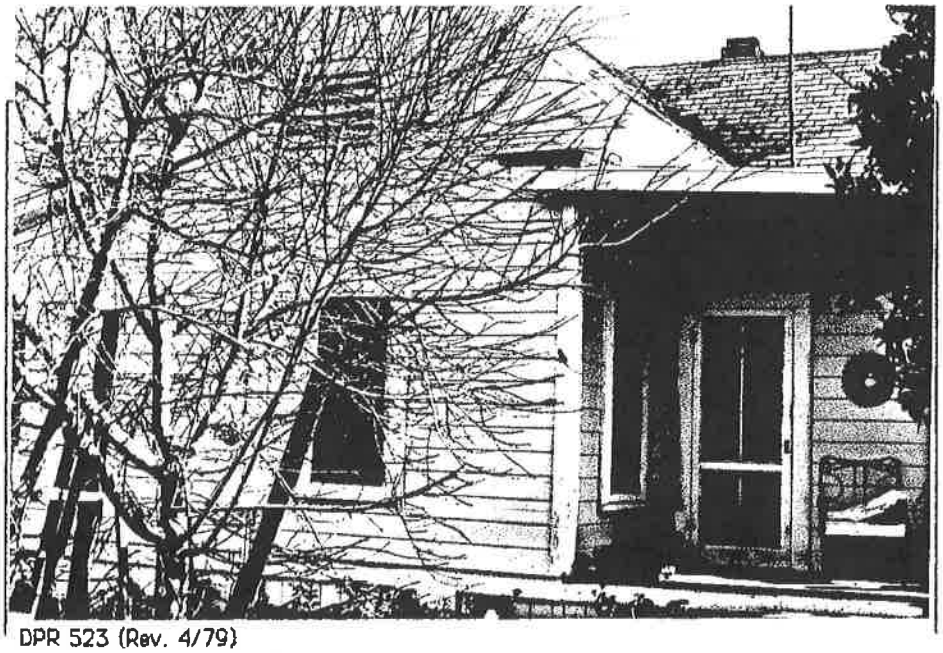
1. Common Name: None
2. Historic Name: Unknown
3. Street or rural address: 993 Riverside Ave.
   City Bardsdale Zip 93015 County Ventura
4. Parcel number: 046-110-085
5. Present Owner: Perry Grainger Address same
   City ____ Zip ____ Ownership is: Public ____ Private X
6. Present Use: single family residence/ranch Original Use: same

DESCRIPTION

7a. Architectural style: turn-of-the-century farmhouse with Victorian influences

7b. Briefly describe the present physical description of the site or structure and describe any major alterations from its original condition:

This single story residence has a modified L-shape with high intersecting gable roofs. The Victorian era detailing is seen in the classical eave treatment with boxed beams and returned eaves. Windows are narrow and rectangular in shape and siding is wide shiplap. A portion of the roof is almost flat over the porch. The porch is supported by slender chamfered wood columns. The house rests on a sespe stone foundation and has a vertical board skirt. A chimney punctuates the roofline.



8. Construction date: 1900
   Estimated X Factual ____
9. Architect unknown
10. Builder unknown
11. Approx. property size (in feet)
    Frontage ____ Depth ____
    or approx. acreage 9.31
12. Date(s) of encl. photograph(s)
    3/87 91

DPR 523 (Rev. 4/79)

EXHIBIT 2

13. Condition: Excellent ___ Good X Fair ___ Deteriorated ___ No longer in existence ___

14. Alterations: back porch - concrete steps and new roof

15. Surroundings: (Check more than one if necessary) Open land ___ Scattered buildings X Densely built-up ___

Residential X Industrial ___ Commercial ___ Other agricultural

16. Threats to site: None known X Private development ___ Zoning ___ Vandalism ___

Public Works project ___ Other: ___

17. Is the structure: On its original site? X Moved? ___ Unknown? ___

18. Related features: shed, carport, mature trees

SIGNIFICANCE

19. Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site.)

This house was built around 1900. The owner of the property in 1912 was Charles Baldeschweiler. It is possible that this house was built for Gottlieb Baldeschweiler, Charles' father. The family came to the Bardsdale area in 1891 from Northern California. Mr. Baldeschweiler was born in Switzerland and his wife was born in Germany. Another possible early owner was Joe Dematies. No information has been found on Mr. Dematies.

The house is significant architecturally as one of the few houses remaining in Bardsdale from the turn-of-the-century.

20. Main theme of the historic resource: (if more than one is checked, number in order of importance.)

Architecture X Arts & Leisure ___

Economic/Industrial ___ Exploration/Settlement ___

Government ___ Military ___

Religion ___ Social/Education ___

21. Sources (List books, documents, surveys, personal interviews and their dates).

Ventura County Assessor's records; 1912 Historical Atlas; Interview with Harold Balden

22. Date form prepared September 22, 1987

By (name) Judy Triem

Organization Ventura Co. Cultural Heritage Board

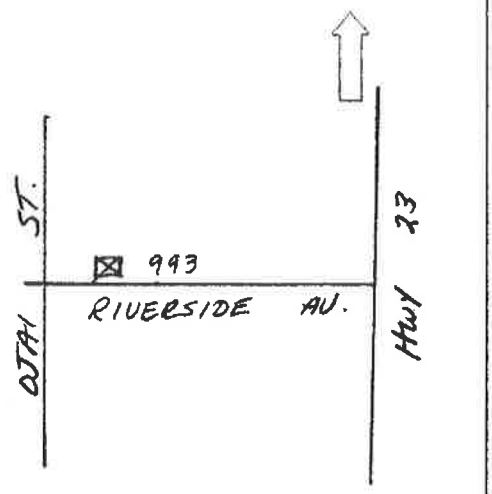
Address: 800 S. Victoria Ave.

City Ventura Zip 93009

Phone: (805) 654-3967

9/a

Locational sketch map (draw and label site and surrounding streets, roads and prominent landmarks):



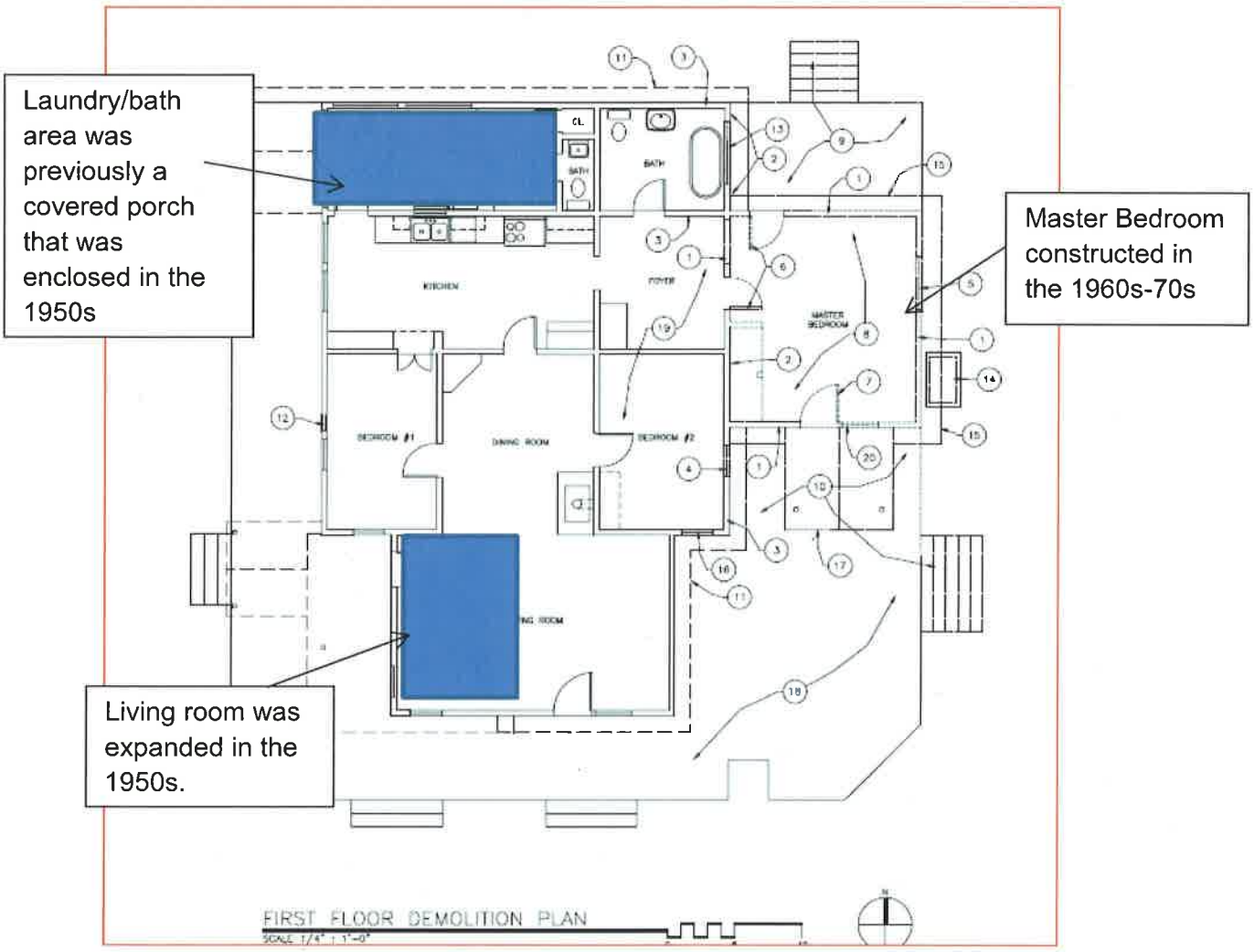

Laundry/bath area was previously a covered porch that was enclosed in the 1950s
Master Bedroom constructed in the 1960s-70s
Living room was expanded in the 1950s.
FIRST FLOOR DEMOLITION PLAN

Exhibit 3

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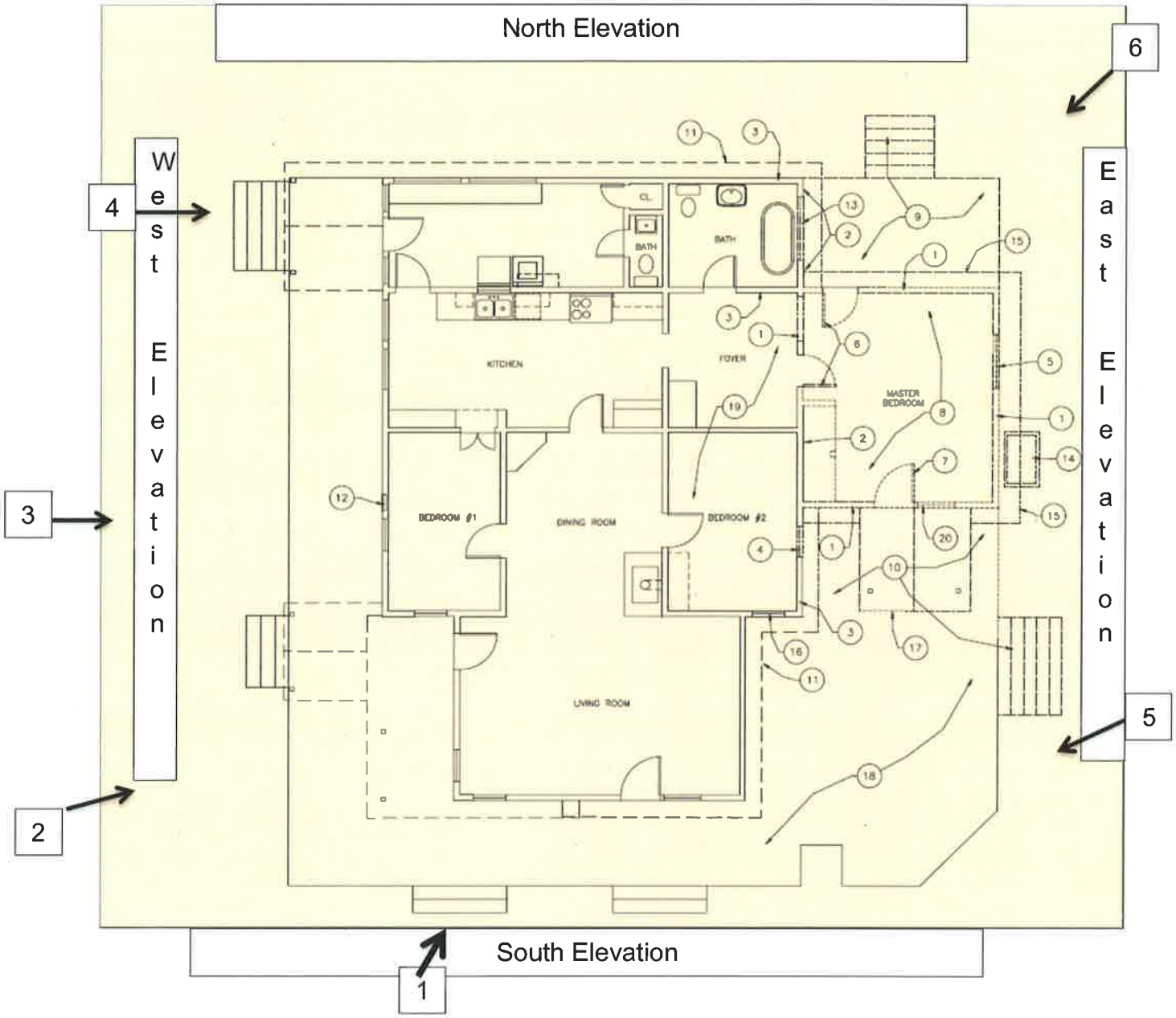

993 Riverside Avenue - Existing Floor Plan and Photo (1-6) Index Map

Exhibit 4

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Photo #1 South Elevation (Living room area)

Photo #2 West Elevation (Living room, bdrm#1, and kitchen)

Exhibit 5

Photo #3 West Elevation (bdrm #1, kitchen)

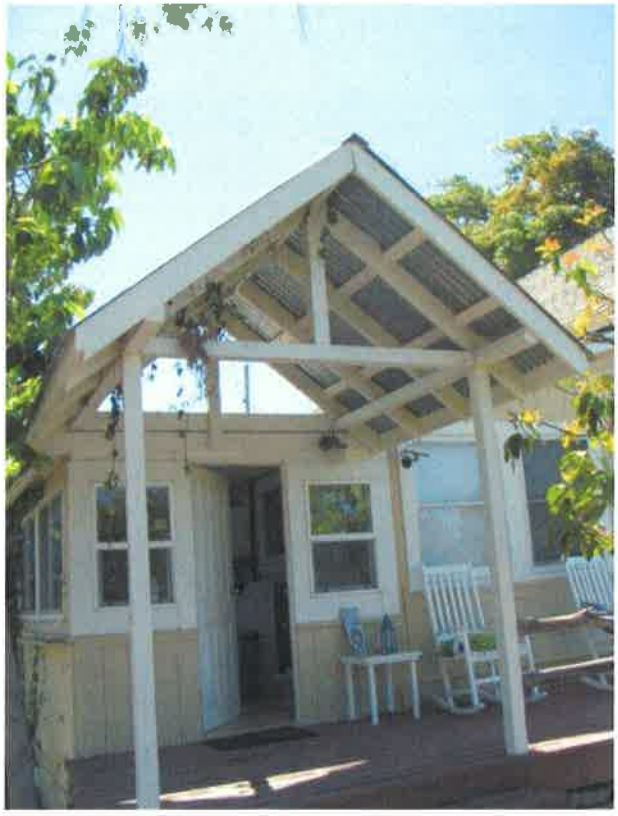

Photo #4 West Elevation (Laundry entrance)

Photo #5 East Elevation (bdrm #2 and master bdrm)

Photo #6 North Elevation (master bdrm entrance door and bath)

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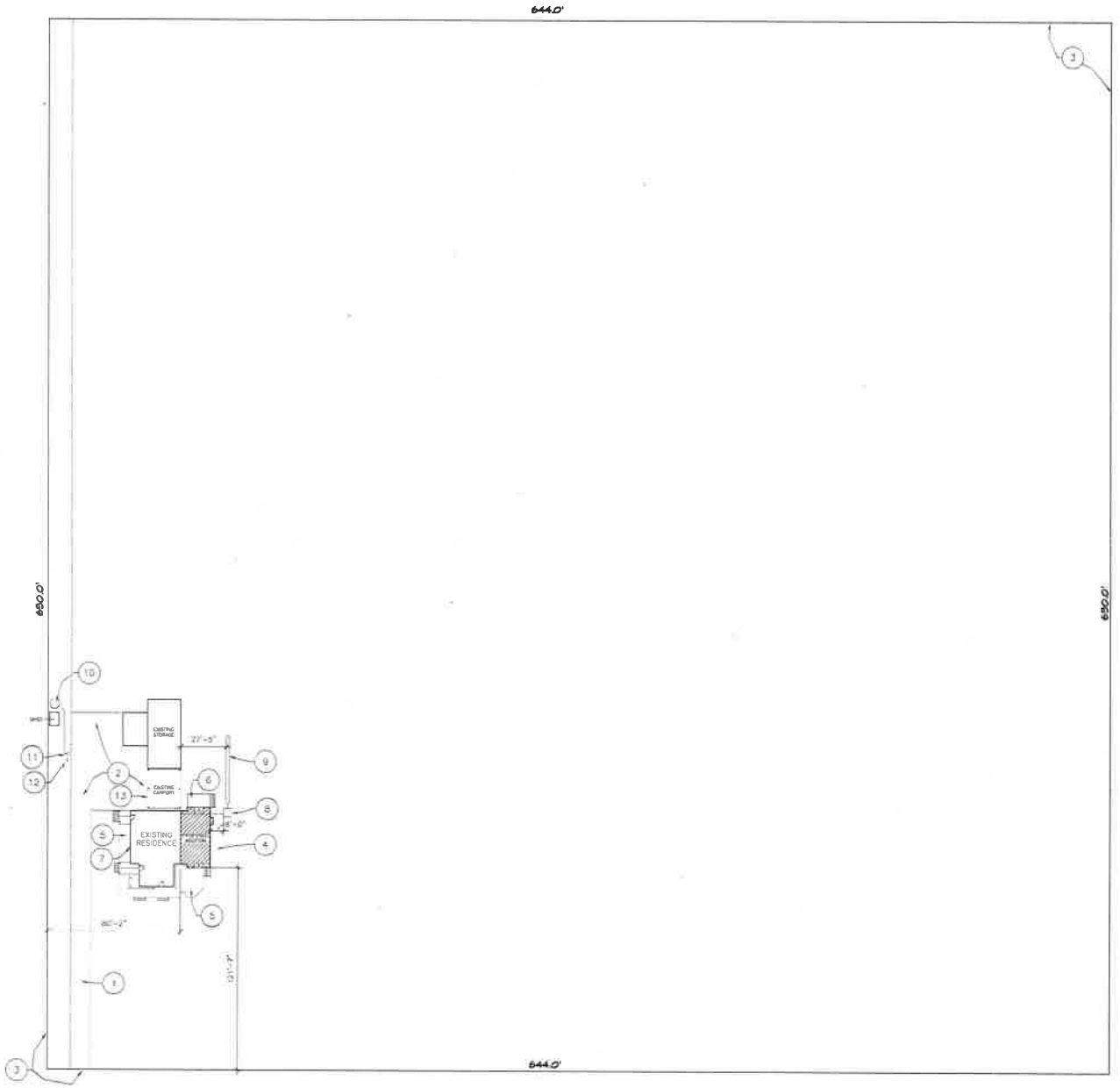
EXHIBIT 6



SITE PLAN
SCALE 1" = 30'-0"

NOTE LEGEND

1. EXISTING 15'-0" WIDE ALL WEATHER ACCESS ROAD TO REMAIN.
2. EXISTING ALL WEATHER TURN-A-ROUND AREA TO REMAIN.
3. PROPERTY LINES.
4. FINISH GRADE AROUND THE ADDITION AND GARAGE SHALL SLOPE AWAY FROM THE FOUNDATION A MINIMUM 2% FOR THE FIRST 4 FEET.
5. EXISTING RAISED WOOD DECK TO REMAIN.
6. WOOD FRAMED RAISED WOOD DECK.
7. EXISTING 200 AMP SERVICE PANEL AND METER TO REMAIN.
8. EXISTING SEEPAGE PIT TO REMAIN.
9. EXISTING 40' LONG INFILTRATOR CHAMBER TO REMAIN.
10. 4000 GALLON WATER TANK ON COMPACTED FILL WITH A 4" GRAVEL BASE PAD SEE DETAIL 1/A1.
11. DRAFTING HYDRANT LOCATION. SEE DETAIL 2/A1.
12. DRAFTING HYDRANT SIAMESE LOCATION. SEE DETAIL 2/A1.
13. LINE OF EAVE ABOVE.

GENERAL NOTES

ALL CONSTRUCTION SHALL BE DONE PER REQUIREMENTS DESCRIBED IN THE 2011 EDITION OF THE CALIFORNIA BUILDING, MECHANICAL, ELECTRICAL, AND PLUMBING CODES AS AMENDED BY THE COUNTY OF VENTURA BUILDING CODE.

THE CALIFORNIA ENERGY CONSERVATION STANDARDS FOR RESIDENTIAL BUILDINGS HAVE BEEN REVIEWED AND THE RESIDENTIAL DESIGN DESCRIBED ON THESE PAGES IS IN SUBSTANTIAL CONFORMANCE. NO DEVIATION OF DESCRIBED DESIGN SHALL BE PERMITTED.

ALL DIMENSIONS SHALL BE FROM FACE OF STUD UNLESS OTHERWISE NOTED.

ALL INTERIOR WALL AND CEILING FINISHES SHALL BE 5/8" TYPE 'X' GYPSUM WALLBOARD WITH A SMOOTH TEXTURE WITH A PAINT FINISH; UNLESS OTHERWISE NOTED.

SEPARATE PERMITS WILL BE REQUIRED FOR PLUMBING, MECHANICAL, AND ELECTRICAL WORK AS APPLICABLE.

PROVIDE EMERGENCY EXIT DOOR OR WINDOW FROM BASEMENT AND/OR SLEEPING ROOM(S). NET CLEAR WINDOW OPENING AREA SHALL BE NOT LESS THAN 5.7 SQ. FT.(821 SQ. IN.), (EXCEPT AT GRADE FLOOR OPENING SHALL BE MIN. 5.0 SQ. FT.) MIN. NET WINDOW OPENING HEIGHT DIMENSION, 24" CLEAR, MIN. NET OPENING WIDTH DIMENSION, 20" CLEAR. TINGHEST SILL HEIGHT 44" ABOVE FLOOR.

GLAZING WITHIN A 24" ARC OF THE DOORWAY/GLAZING WITHIN 18" OF FLOOR/GLAZING IN SHOWER AND BATHTUB DOORS AND ENCLOSURES SHALL BE TEMPERED.

GLAZING IN DOORS SHALL BE TEMPERED.

SHOWERS AND SHOWER-TUB COMBINATIONS SHALL BE PROVIDED WITH INDIVIDUAL CONTROL VALVES OF THE PRESSURE BALANCE OR THERMOSTATIC MIXING VALVE TYPE.

PLUMBING FIXTURES WITH THE FOLLOWING MAXIMUM WATER USAGE SHALL BE INSTALLED:

A. TANK-TYPE TOILETS SHALL HAVE A MAXIMUM FLUSH OF 1.28 GALLONS.

B. WATER-SAVING SHOWER HEADS SHALL HAVE A MAXIMUM FLOW OF 2.5 GALLONS PER MINUTE.

C. WATER-SAVING SINK AND LAVATORY FAUCETS SHALL HAVE A MAXIMUM FLOW OF 2.2 GALLONS PER MINUTE.

COPPER PLUMBING LINES SHALL BE MINIMUM TYPE L.

PROJECT DATA

ASSESSOR PARCEL NO. 048-0-110-085

ZONED: AE-10 AC

TYPE OF CONSTRUCTION: V-B

OCCUPANCE: GROUP R/DIVISION 3 AND GROUP U/DIVISION 1

SPRINKLERS: NO

STORIES: ONE

LOT AREA: 405,453 S.F. 9.31 AC

TOTAL LOT COVERAGE: 3348 S.F.

EXISTING BUILDING AREA:	RESIDENCE	1488 S.F. R-3
	DETACHED GARAGE/CARPORT	1800 S.F. U-1
	SHED	50 S.F. U-1
AREA TO BE REMOVED:	RESIDENCE	335 S.F. R-3

PROPOSED BUILDING AREA:

RESIDENCE ADDITION		
FIRST FLOOR	643 S.F.	R-3
SECOND FLOOR	347 S.F.	R-3
TOTAL ADDITION	990 S.F.	R-3
TOTAL RESIDENCE AREA	2243 S.F.	R-3

LIST OF DRAWINGS

WA
WALLACE ARCHITECTURE
TIM A. WALLACE, LEED AP
VENTURA, P. O. BOX 6158 93006
(805) 647-3070 FAX (805) 647-3071

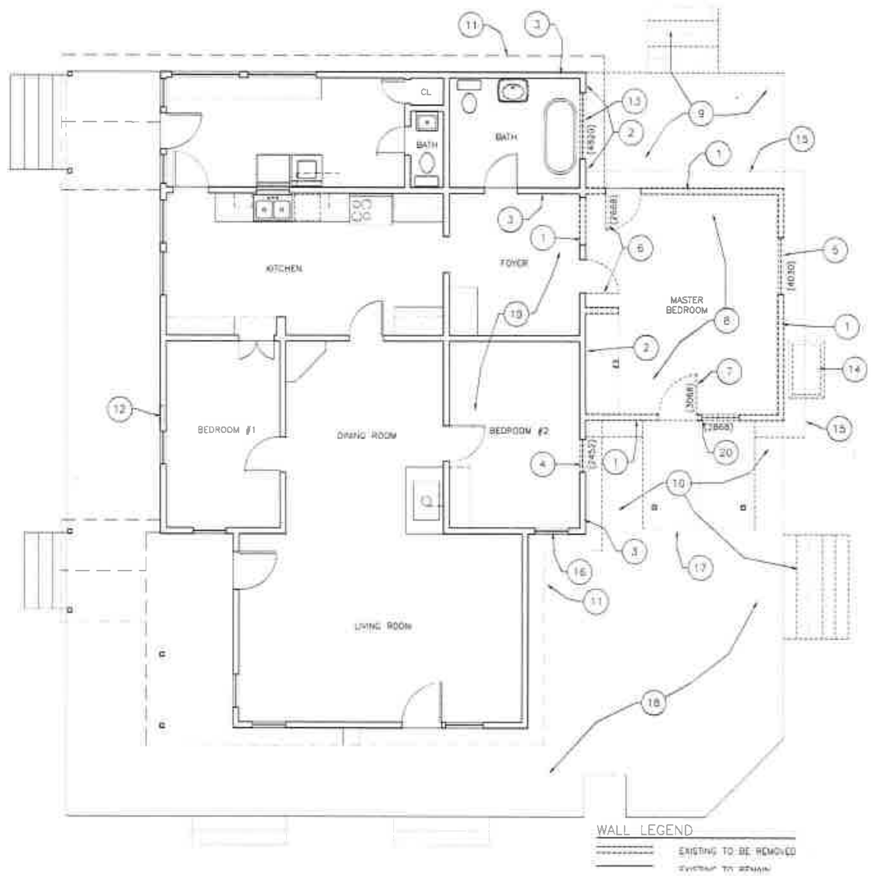
Sheet: SITE PLAN, PROJECT DATA, LIST DRAWINGS, GENERAL NOTES
Title:

Job No.	
Date:	1/09/13
Scale:	1" = 30'
Drawn:	TAW
Checked:	TAW

RESIDENCE ADDITION
REISMAN RESIDENCE
893 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No. A1

These drawings, including the designs incorporated herein, as an instrument of professional service, are and shall remain the property of the architect whether the project for which they are made is executed or not. They are not to be changed or copied in any form or manner whatsoever nor are they to be assigned to any third party without first obtaining the expressed written permission and consent of the architect. Any unauthorized use of these drawings will be at the sole risk of the unauthorized user and with no liability to the architect. Visual contact with these drawings shall constitute prima facie evidence of the acceptance of these restrictions.



FIRST FLOOR DEMOLITION PLAN

SCALE 1/4" = 1'-0"

NOTE LEGEND

1 EXISTING 2 X 4 WOOD STUD WALL TO BE REMOVED
2 REMOVE EXISTING SIDING/FINISHES FROM EXISTING 2 X 4 WOOD STUD WALL
3 EXISITNG 2 X 4 WOOD STUD WALL TO REMAIN
4 EXISTING WOOD FRAMED DOUBLE HUNG WINDOW TO BE REMOVED
5 EXISTING ALUMINUM FRAMED SLIDING WINDOW TO BE REMOVED THIS SHEET
6 EXISTING RAISED PANEL WOOD DOOR TO BE REMOVED
7 EXISTING WOOD FRAMED FRENCH DOOR TO BE REMOVED
8 EXISTING WOOD FRAMED RAISED FLOOR TO BE REMOVED
9 EXISTING WOOD FRAMED RAISED DECK AND STAIR TO BE REMOVED
10 EXISTING WOOD FRAMED RAISED WOOD DECK TO BE REMOVED AND MODIFIED AS REQUIRED FOR ADDITION. REMOVED EXISTING WOOD FRAMED STAIRS
11 DASHED LINE REPRESENTS EDGE OF EAVE ABOVE
12 EXISTING 200 AMP ELECTRICAL SERVICE PANEL AND METER WITH OVERHEAD DROP TO REMAIN
13 EXISTING WOOD FRAMED COMBINATION WINDOW TO BE REMOVED
14 EXISTING AIR CONDITIONING UNIT/CONDENSER AND CONCRETE MOUNTING PAD TO BE REMOVED
15 EXISTING WOOD FRAMED FLAT ROOF TO BE AMENDED
16 EXISTING WOOD FRAMED DOUBLE HUNG WINDOW TO REMAIN
17 EXISTING WOOD FRAMED COVERED PORCH TO BE REMOVED
18 EXISTING WOOD FRAMED RAISED DECK TO REMAIN
19 EXISTING WOOD FRAMED WOOD FLOOR STRUCTURE TO REMAIN
20 EXISTING WOOD FRAMED SIDELIGHT TO BE REMOVED

WA

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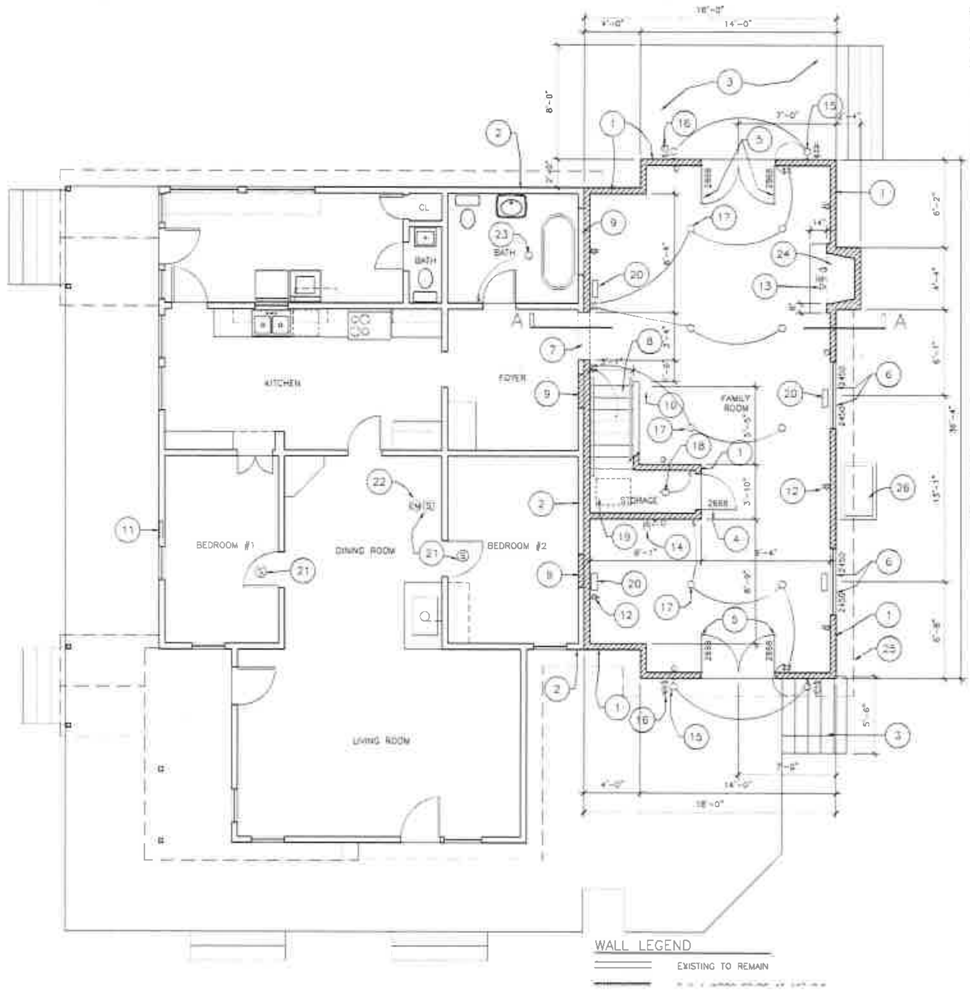
Sheet Title: FIRST FLOOR DEMOLITION PLAN

job no.	
date	1/17/13
drawn	TW
checked	TW
approved	TW

RESIDENCE ADDITION
REISMAN RESIDENCE
993 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No
A2



FIRST FLOOR PLAN

SCALE 1/4" = 1'-0"

NOTE LEGEND

1 2 X 4 WOOD STUDS AT 16" ON CENTER
2 EXISTING 2 X 4 WOOD STUD WALL TO REMAIN
3 RAISED WOOD DECK WITH WOOD STAIRS. TOP OF DECK TO MAXIMUM 29" ABOVE ADJACENT GRADE. STAIRS SHALL HAVE A MAXIMUM 7 3/4" RISE AND A MINIMUM 10" RUN.
4 1 3/8" S.C. STAIN GRADE RAISED PANEL WOOD DOOR WITH A PAINT FINISH, TYPICAL. DOOR AND FRAME SHALL HAVE A STAIN FINISH
5 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED FRENCH DOOR
6 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED SINGLE HUNG WINDOW
7 WOOD CASED OPENING. WOOD CASING SHALL HAVE A PAINT FINISH
8 WOOD FRAMED STAIR. STAIRWAY SHALL HAVE A MAXIMUM 7 3/4" RISE AND A MINIMUM 10" RUN. PROVIDE 2" DIA. WOOD HANDRAIL EACH SIDE AT 34" ABOVE STAIR NOSING
9 INFILL EXISTING DOOR AND WINDOW OPENINGS WITH 2 X 4 WOOD STUDS AT 16" ON CENTER
10 4 X 6 WOOD POST. FINISH IN WOOD TRIM WITH A PAINT FINISH.
11 EXISTING 200 AMP ELECTRICAL SERVICE PANEL, METER, AND OVERHEAD DROP TO REMAIN
12 DUPLEX ELECTRICAL OUTLET, TYPICAL. PROVIDE ARC-FAULT CIRCUIT INTERRUPTER OUTLETS IN BEDROOMS ON SEPARATE CIRCUITS
13 TELEPHONE OUTLET
14 CABLE TELEVISION OUTLET
15 WALL MOUNTED FLUORESCENT LIGHT FIXTURE. U.L. RATED FOR WET LOCATION. FIXTURE SHALL HAVE PHOTOCELL OVERIDE
16 G.F.I.C. WATERPROOF DUPLEX ELECTRICAL OUTLET
17 8" DIA. RECESSED INCANDESCENT LIGHT FIXTURE, TYPICAL. PROVIDE DIMMING CAPABILITY AT SWITCH
18 CEILING MOUNTED DECORATIVE FLUORESCENT LIGHT FIXTURE
19 22 X 30 CRAWL SPACE ACCESS. PROVIDE INCANDESCENT LIGHT AND CONVENIENCE DUPLEX ELECTRICAL OUTLET IN ATTIC. LIGHT SWITCH SHALL BE AT ENTRANCE SUB-FLOOR
20 FLOOR MOUNTED HVAC REGISTER
21 CEILING MOUNTED BATTERY POWERED SMOKE DETECTOR
22 CEILING MOUNTED BATTERY POWERED CARBON MONOXIDE DETECTOR
23 POWERED EXHAUST FAN
24 PRE-MANUFACTED FIREPLACE 42" ISOKERN. ICC-ESS# ESR-2316. PROVIDE GAS SHUT-OFF VALVE AT FIXTURE. PROVIDE NON-COMBUSTIBLE HEARTH AS SHOWN. PROVIDE POWER AND COMMUNICATIONS AS SHOWN ABOVE THE MANTEL
25 DASHED LINE REPRESENTS EDGE OF EAVE ABOVE
26 AIR CONDITIONING UNIT/CONDENSER ON 4" CONCRETE PAD. EXACT LOCATION TO BE DETERMINED BY OWNER

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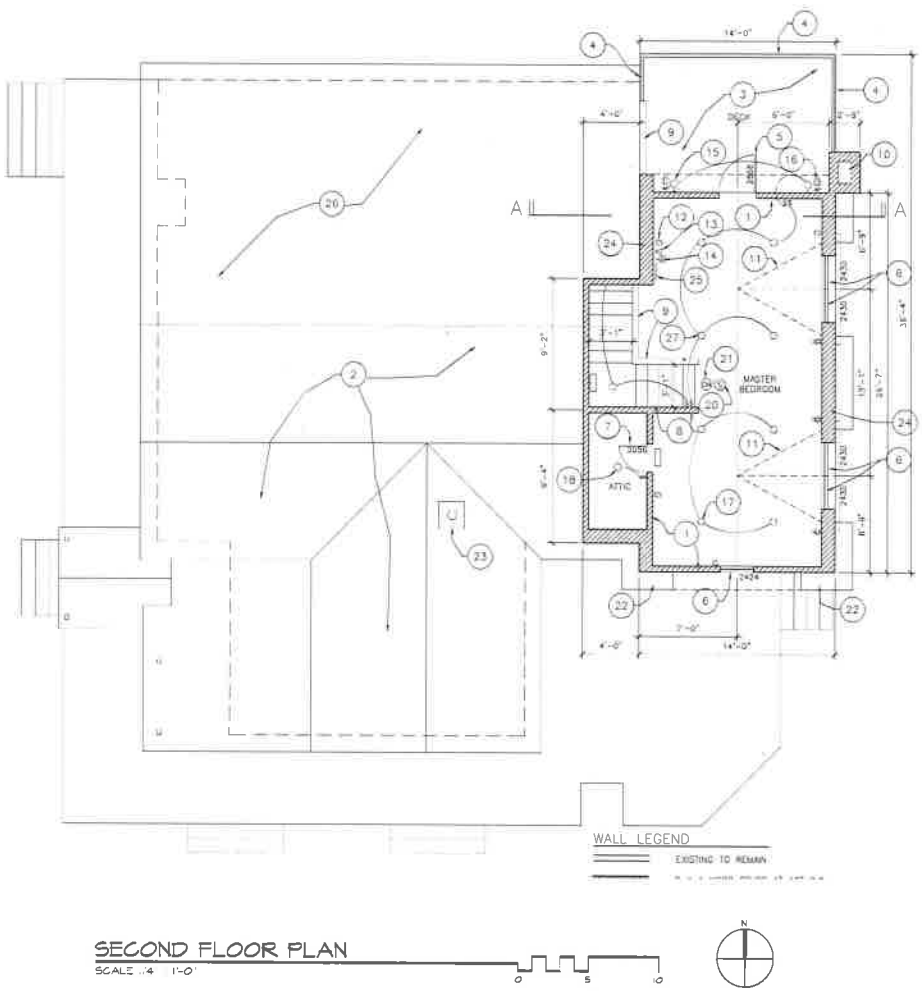
Sheet: FIRST FLOOR PLAN

RESIDENCE ADDITION
REISMAN RESIDENCE
993 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No. A3



SECOND FLOOR PLAN

SCALE: 1/4" = 1'-0"

NOTE LEGEND

1. 2 X 4 WOOD STUDS AT 16" ON CENTER
2. EXISTING COMPOSITION ROOFING WITH A CLASS "A" RATING TO REMAIN
3. WOOD FRAMED DECK WITH A MEMBRANE DECK COATING. DEX-O-TEX WEATHERWEAR DECK COATING AS MANUFACTURED BY CROSSFIELD PRODUCTS. ICC-ES EVALUATION REPORT ESR-1757
4. 42" HIGH VINYL FRAMED GUARDRAIL SYSTEM. "RADIANCE RAIL" GUARDRAIL SYSTEM AS MANUFACTURED BY TIMBERTECH
5. DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED FRENCH DOOR
6. DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED CASEMENT WINDOW
7. 1 3/8" S.C. STAIN GRADE RAISED PANEL WOOD DOOR WITH A PAINT FINISH, TYPICAL. DOOR AND FRAME SHALL HAVE A STAIN FINISH
8. WOOD FRAMED STAIR. STAIRWAY SHALL HAVE A MAXIMUM 7 3/4" RISE AND A MINIMUM 10" RUN. PROVIDE 2" DIA. WOOD HANDRAIL EACH SIDE AT 34" ABOVE STAIR NOSING
9. MINIMUM 42" HIGH GUARDRAIL PONY WALL
10. CHIMNEY FROM FIREPLACE BELOW. PROVIDE MINIMUM 2" CLEARANCE FROM FLUE TO COMBUSTIBLE MATERIAL. PROVIDE CHIMENY WITH SPARK ARRESTOR.
11. DASHED LINE REPRESENTS DOWNERED ROOF LINE ABOVE.
12. DUPLEX ELECTRICAL OUTLET, TYPICAL. PROVIDE ARC-FAULT CIRCUIT INTERRUPTER OUTLETS IN BEDROOMS ON SEPARATE CIRCUITS
13. TELEPHONE OUTLET
14. CABLE TELEVISION OUTLET
15. WALL MOUNTED FLUORESCENT LIGHT FIXTURE. U.L. RATED FOR WET LOCATION. FIXTURE SHALL HAVE PHOTOCELL OVERIDE
16. G.F.I.C. WATERPROOF DUPLEX ELECTRICAL OUTLET
17. 6" DIA. RECESSED INCANDESCENT LIGHT FIXTURE, TYPICAL. PROVIDE DIMMING CAPABILITY AT SWITCH
18. CEILING MOUNTED DECORATIVE FLUORESCENT LIGHT FIXTURE
19. CEILING MOUNTED HVAC REGISTER ABOVE
20. CEILING MOUNTED HARD WIRED WITH BATTERY BACK-UP SMOKE DETECTOR
21. CEILING MOUNTED HARD WIRED WITH BATTERY BACK-UP CARBON MONOXIDE DETECTOR
22. TOP OF CORNICE BELOW. CORNICE TOP SHALL BE A MIN. 24 GA. GALVANIZED FLASHING
23. EXISTING MASONRY CHIMNEY TO REMAIN. PROVIDE SPARK ARRESTOR IF NONE EXISTS
24. 2 X WOOD FRAMED SLOPED ROOF
25. WALL MOUNTED HVAC REGISTER
26. EXISTING BUILT-UP ROOFING WITH A CLASS "A" RATING TO REMAIN

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Sheet: SECOND FLOOR PLAN
Title:

Revisions	Job No.	Date
		1/17/13

RESIDENCE ADDITION
REISMAN RESIDENCE
983 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No: A4

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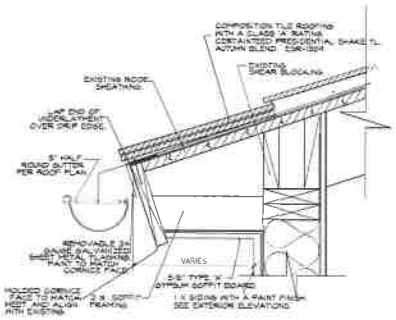
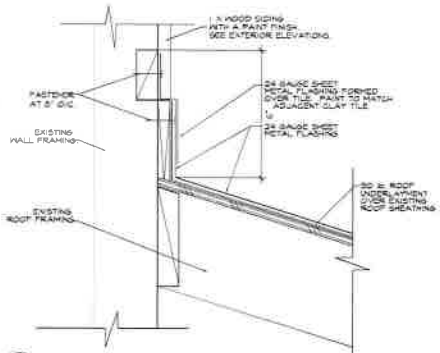
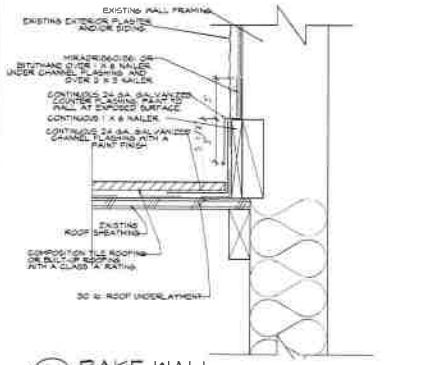


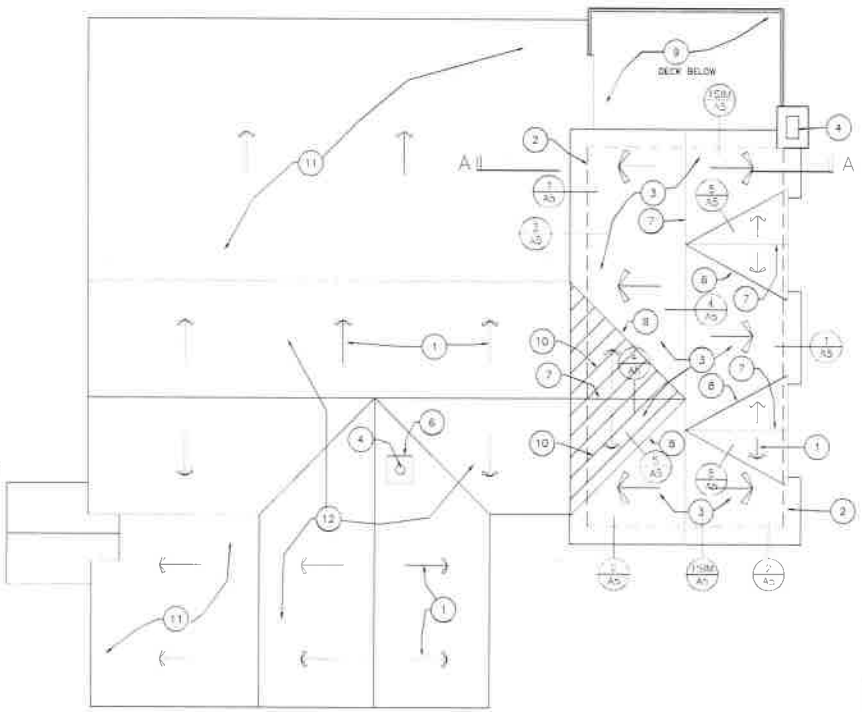
1 ROOF/CORNICE EDGE
SCALE 3" = 1'-0"



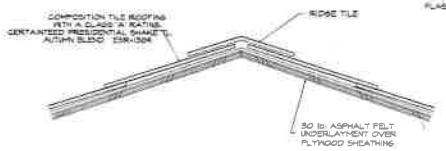
2 CORNICE ROOF TO WALL
SCALE 3" = 1'-0"



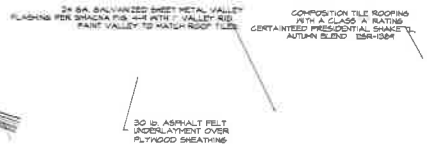
3 RAKE WALL
SCALE 3" = 1'-0"



ROOF PLAN
SCALE 1/4" 1'-0"



4 ROOF/HIP RIDGE
SCALE 3" 1'-0"



5 ROOF VALLEY
SCALE 3" = 1'-0"

NOTE LEGEND

1. DIRECTION OF ROOF SLOPE
2. DASHED LINE REPRESENTS EXTERIOR FACE OF WALL BELOW.
3. COMPOSITION ROOF TILE WITH A CLASS 'A' RATING AS MANUFACTURED BY CERTAINTEED. PRESIDENTIAL SHAKE TL (TRIPLE LAMINATE), AUTUMN BLEND. ICC #ESR-1389
4. U.L. LISTED SPARK ARRESTOR AT TOP OF EXISTING CHIMNEY
5. 5" HALF ROUND PREFINISHED ALUMINUM GUTTER AND DOWNSPOUT
6. EXISTING MASONRY CHIMNEY TO REMAIN
7. RIDGE
8. VALLEY
9. WOOD FRAMED DECK WITH A MEMBRANE DECK COATING. DEX-O-TEX WEATHERWEAR DECK COATING AS MANUFACTURED BY CROSSFIELD PRODUCTS. ICC-ES EVALUATION REPORT ESR-1757.
10. HATCHED AREA DENOTES CALIFORNIA FRAME OVER ROOF FRAMING AND SHEATHING. CALIFORNIA FRAME SHALL BE 2 X 6 ROOF RAFTERS AT 16" ON CENTER
11. EXISTING BUILT-UP ROOFING WITH A CLASS 'A' RATING TO REMAIN.
12. EXISTING COMPOSITION SHINGLE ROOFING WITH A CLASS 'A' RATING TO REMAIN.

GENERAL ROOF NOTES

ROOF VALLEY FLASHING SHALL BE PROVIDED OF 24 GAUGE GALVANIZED SHEET CORROSION-RESISTANT METAL AND SHALL EXTEND AT LEAST 8 INCHES FROM THE CENTER LINE EACH WAY. SECTIONS OF FLASHING SHALL EXTEND AT LEAST 8 INCHES FROM THE CENTERLINE EACH WAY. SECTIONS OF FLASHING SHALL HAVE AN END LAP OF NOT LESS THAN 6 INCHES. ALTERNATIVELY, THE VALLEY SHALL CONSIST OF WOVEN ASPHALT SHINGLES APPLIED IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTION.

ATTIC VENTING: MAINTAIN EAVE ATTIC VENT EQUAL TO ONE SQUARE FOOT PER 150 S.F. OF ATTIC AREA OR ONE SQUARE FOOT PER 300 S.F. OF ATTIC AREA WITH 1/2 OF THE VENT AREA NEAR THE RIDGE, AT LEAST THREE FEET HIGHER, AND THE REMAINDER OF THE AREA AT EAVE OR CORNICE VENTS OR ONE SQUARE FOOT PER 300 S.F. OF ATTIC. AREA PROVIDED A VAPOR BARRIER NOT EXCEEDING 1-PERM IS INSTALLED ON THE WARM SIDE OF THE ATTIC INSULATION.

ATTIC VENTS ARE REQUIRED TO BE PROTECTED BY 1/4 INCH CORROSION RESISTANT METAL MESH.

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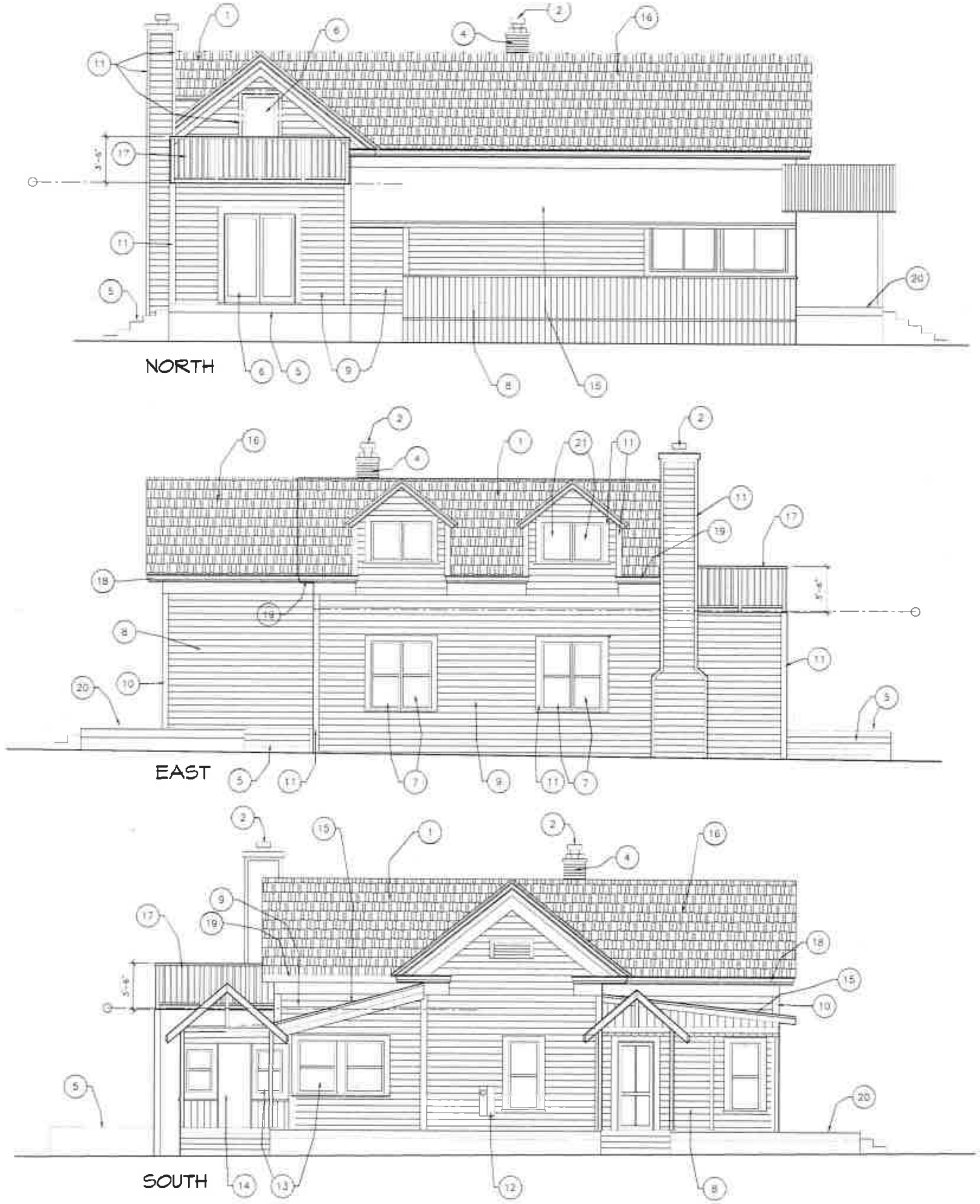
Sheet ROOF PLAN, DETAILS
Title
Job No.
Date 7/17/13
Drawn W.
Checked W.
Revisions

RESIDENCE ADDITION
REISMAN RESIDENCE
993 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No. A5



EXTERIOR ELEVATIONS

SCALE 1/4" = 1'-0"

NOTE LEGEND

1 COMPOSITION ROOF TILE WITH A CLASS 'A' RATING AS MANUFACTURED BY CERTAINTEED 'PRESIDENTIAL SHAKE TL' (TRIPLE LAMINATE) AUTUMN BLEND ICC #ESR-1389. CONTRACTOR TO VERIFY COLOR AND TYPE OF PROPOSED ROOF MATCHES EXISTING

2 U.L. LISTED SPARK ARRESTOR AT TOP OF EXISTING AND NEW CHIMNEY

3 5" HALF ROUND PREFINISHED ALUMINUM GUTTER AND DOWNSPOUT

4 EXISTING MASONRY CHIMNEY TO REMAIN

5 RAISED WOOD DECK WITH WOOD STAIRS. TOP OF DECK TO MAXIMUM 29" ABOVE ADJACENT GRADE. STAIRS SHALL HAVE A MAXIMUM 7 3/4" RISE AND A MINIMUM 10" RUN

6 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED FRENCH DOOR

7 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED SINGLE HUNG WINDOW

8 EXISTING 1 X PAINTED WOOD SIDING TO REMAIN

9 1 X PAINTED WOOD SIDING TO MATCH, MEET, AND ALIGN WITH EXISTING

10 EXISTING 1 X PAINTED WOOD TRIM TO REMAIN

11 1 X PAINTED WOOD TRIM TO MATCH EXISING

12 EXISTING 200 AMP ELECTRICAL SERVICE PANEL, METER, AND OVERHEAD DROP TO REMAIN

13 EXISTING WOOD WINDOW TO REMAIN

14 EXISTING WOOD DOOR WITH GLASS LITE TO REMAIN

15 EXISTING BUILT-UP ROOFING WITH A CLASS 'A' RATING TO REMAIN

16 EXISTING COMPOSITION SHINGLE ROOFING WITH A CLASS 'A' RATING TO REMAIN

17 42" HIGH VINYL FRAMED GUARDRAIL SYSTEM. "RADIANCE RAIL" GUARDRAIL SYSTEM AS MANUFACTURED BY TIMBERTECH

18 EXISTING PAINTED WOOD CORNICE TO REMAIN

19 1 X PAINTED WOOD CORNICE TO MATCH, MEET AND ALIGN WITH EXISTING. PROVIDE 5/8" TYPE 'X' GYPSUM SOFFIT BOARD AT UNDERSIDE OF CORNICE AND EAVES. PROVIDE A PAINT FINISH

20 EXISTING WOOD FRAMED RAISED WOOD DECK TO REMAIN

21 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED CASEMENT WINDOW

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Sheet Title: EXTERIOR ELEVATIONS

date: 1/17/13

RESIDENCE ADDITION
REISMAN RESIDENCE
993 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

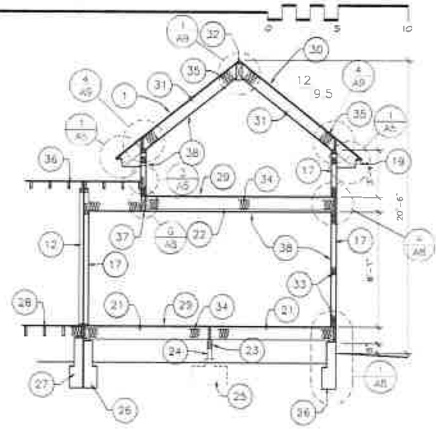
Sheet No. A6

SOUTH

WEST

EXTERIOR ELEVATIONS

SCALE 1/4" = 1'-0"



SECTION A - A

SCALE 1/4" = 1'-0"

NOTE LEGEND

1 COMPOSITION ROOF TILE WITH A CLASS "A" RATING AS MANUFACTURED BY CERTAINTEED PRESIDENTIAL SHAKE TL (TRIPLE LAMINATE), AUTUMN BLEND ICC #ESR-1389 CONTRACTOR TO VERIFY COLOR AND TYPE OF PROPOSED ROOF MATCHES EXISTING

2 U.L. LISTED SPARK ARRESTOR AT TOP OF EXISTING AND NEW CHIMNEY

3 5" HALF ROUND PREFINISHED ALUMINUM GUTTER AND DOWNSPOUT

4 EXISTING MASONRY CHIMNEY TO REMAIN

5 RAISED WOOD DECK WITH WOOD STAIRS TOP OF DECK TO MAXIMUM 22" ABOVE ADJACENT GRADE STAIRS SHALL HAVE A MAXIMUM 7 3/4" RISE AND A MINIMUM 10" RUN

6 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED FRENCH DOOR

7 DUAL GLAZED TEMPERED ALUMINUM CLAD WOOD FRAMED CASEMENT WINDOW

8 EXISTING 1 X PAINTED WOOD SIDING TO REMAIN

9 1 X PAINTED WOOD SIDING TO MATCH, MEET, AND ALIGN WITH EXISTING

10 EXISTING 1 X PAINTED WOOD TRIM TO REMAIN

11 1 X PAINTED WOOD TRIM TO MATCH EXISTING

12 EXISTING 2 X 4 WOOD FRAMED STUD WALL TO REMAIN

13 EXISTING WOOD WINDOW TO REMAIN

14 EXISTING WOOD DOOR WITH GLASS LITE TO REMAIN

15 EXISTING BUILT-UP ROOFING WITH A CLASS 'A' RATING TO REMAIN

16 EXISTING COMPOSITION SHINGLE ROOFING WITH A CLASS 'A' RATING TO REMAIN

17 2 X 4 WOOD STUD WALL

18 EXISTING PAINTED WOOD CORNICE TO REMAIN

19 1 X PAINTED WOOD CORNICE TO MATCH, MEET AND ALIGN WITH EXISTING PROVIDE 5/8" TYPE 'X' GYPSUM SOFFIT BOARD AT UNDERSIDE OF CORNICE AND EAVES PROVIDE A PAINT FINISH

20 EXISTING WOOD FRAMED RAISED WOOD DECK TO REMAIN

21 9 1/2" TJI230 FLOOR JOISTS AT 16" ON CENTER

22 11 7/8" TJI230 FLOOR JOISTS AT 16" ON CENTER

23 4 X 8 WOOD FLOOR GIRDER

24 4 X 4 WOOD POST

25 30" SQUARE BY 15" DEEP CONCRETE PAD FOOTING WITH (3)#5 REBAR 12" ON CENTER EACH WAY 3" FROM BOTTOM OF PAD FOOTING

26 CONTINUOUS CONCRETE STEM WALL FOOTING

27 EXISTING FOOTING TO REMAIN

28 EXISTING 2 X WOOD FLOOR FRAMING TO REMAIN

29 5/8" CDX PLYWOOD FLOOR SHEATHING

30 5/8" CDX PLYWOOD ROOF SHEATHING

31 2 X 10 ROOF RAFTERS AT 16" ON CENTER

32 5.25 X 14 PSL RIDGE BEAM

33 R-13 BATT INSULATION

34 R-30 BATT INSULATION

35 R-30 EQUIVALENTS SPRAYED ON INSULATION

36 EXISTING 2 X WOOD ROOF FRAMING TO REMAIN

37 3.5 X 9.5 LVL ENGINEERED BEAM

38 1/2" GYPSUM WALLBOARD WITH A PAINT FINISH

RIGID INSULATION GENERAL NOTES

UNVENTED ATTIC ASSEMBLIES SHALL MEET THE FOLLOWING:

1 THE UNVENTED ATTIC SPACE IS COMPLETELY CONTAINED WITHIN THE BUILDING THERMAL ENVELOPE

2 NO INTERIOR VAPOR RETARDERS ARE INSTALLED ON THE CEILING SIDE OF THE UNVENTED ATTIC ASSEMBLY

3 IN CLIMATE ZONE 16, ANY AIR-IMPERMEABLE INSULATION SHALL BE A VAPOR RETARDER, OR SHALL HAVE A VAPOR RETARDER COATING OR COVERING IN DIRECT CONTACT WITH THE UNDERSIDE OF THE INSULATION

4 EITHER ITEMS 4.1, 4.2, OR 4.3 SHALL BE MET, DEPENDING ON THE AIR PERMEABILITY OF THE INSULATION DIRECTLY UNDER THE STRUCTURAL ROOF SHEATHING

4.1 AIR-IMPERMEABLE INSUALTION ONLY INSULATION SHALL BE APPLIED IN DIRECT CONTACT WITH THE UNDERSIDE OF THE STRUCTURAL ROOF SHEATHING

4.2 AIR-PERMEABLE INSULATION ONLY. IN ADDITION TO THE AIR-PERMEABLE INSULATION INSTALLED DIRECTLY BELOW THE STRUCTURAL SHEATHING, RIGID BOARD OR SHEET INSULATION WITH AN R-VALUE OF R-4 SHALL BE INSTALLED DIRECTLY ABOVE THE STURUCTAL ROOF SHEATHING FOR CONDENSATION CONTROL.

4.3 AIR-IMPERMEABLE AND AIR-PERMEABLE INSULATION THE AIR-IMPERMEABLE INSULATION SHALL BE APPLIED IN DIRECT CONTACT WITH THE UNDERSIDE OF THE STRUCTURAL ROOF SHEATHING FOR CONDENSATION CONTROL THE AIR-PERMEABLE INSULATION SHALL BE INSTALLED DIRECTLY UNDER THE AIR-IMPERMEABLE INSULATION.

WA
WALLACE ARCHITECTURE
TIM A. WALLACE, LEED AP
P. O. BOX 8152
VENTURA, CALIFORNIA 93006
(805) 647-3570 FAX (805) 647-3571

Sheet Title: EXTERIOR ELEVATION - WEST, SECTION A - A

RESIDENCE ADDITION
REISMAN RESIDENCE
993 RIVERSIDE DRIVE
FILLMORE, CALIFORNIA

Sheet No. A7

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VENTURA COUNTY CULTURAL HERITAGE BOARD
STAFF REPORT AND RECOMMENDATIONS
AGENDA OF FEBRUARY 11, 2013
ITEM NO. 5b

SUBJECT:

Request for a Certificate of Appropriateness for Phase 3 Renovation of Ventura County Historical Landmark No. 172 (Ventura County Agricultural Buildings and site), Case No. CH12-0019

APPLICANT

Rasmussen & Associates
Cathy Wilson, Project Architect
21 S. California Street, 4th Floor
Ventura, California 93001

PROPERTY OWNER

Ventura County Agricultural
Commissioner's Office
815 East Santa Barbara Street
Santa Paula, CA 93060

REQUEST:

The applicant is requesting approval of a Certificate of Appropriateness for the Agricultural Commissioner Office Building Renovation Phase 3 (Window replacement, HVAC system installation, Roof Structure Upgrade and Proposed Signage) located at 815 and 845 East Santa Barbara Street, Santa Paula - Ventura County Historical Landmark No. 172.

LOCATION:

815 and 845 East Santa Barbara Street, Santa Paula, CA / APN 103-0-072-035

BACKGROUND:

Historical Background

On May 14, 2012, the Ventura County Cultural Heritage Board designated the Ventura County Agricultural buildings as Ventura County Historical Landmark No 172. The property met three of the county's criteria for landmark eligibility, Criterion 2 (associated with events that have made a significant contribution to the broad patterns of Ventura County regional history), Criterion 3 (associated with the lives of persons important to Ventura County) and Criterion 5 (embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master).

The Ventura County Agricultural buildings were designed by Roy C. Wilson, Ventura County's first licensed architect and head of one of the county's most successful and

prolific architectural practices. The Agricultural Office was constructed in 1929 as the Ventura County Horticultural Building but renamed during its construction as the Ventura County Agricultural Building. The Office building was designed in the Spanish Revival architectural style.

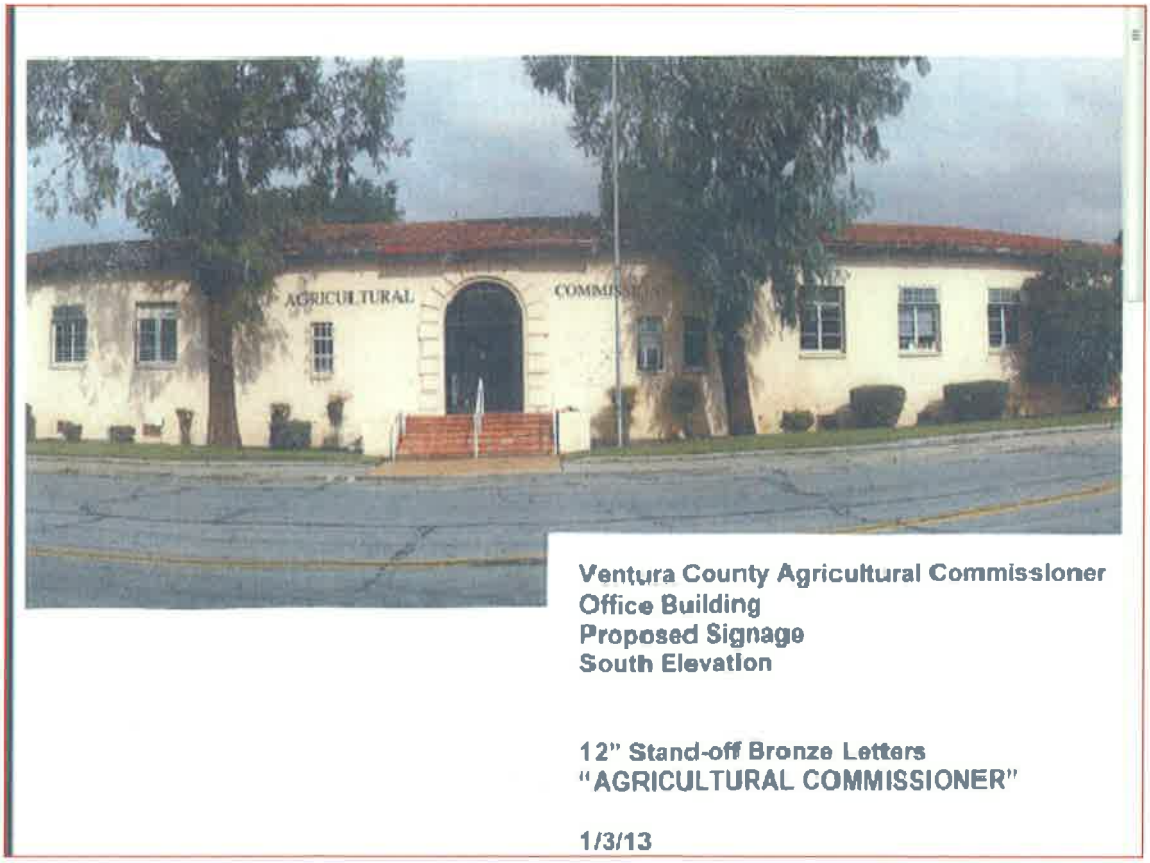
VENTURA COUNTY AGRICULTURAL BUILDING, POSTCARD. This building still serves as the offices and warehouse for the county agricultural commissioner. When built, the city's newspaper editor crowed, "It is yet another indication that we are considered the center of the county's agricultural interests." Roy C. Wilson Sr. was the architect of this structure that stands at 815 East Santa Barbara Street.

PROJECT ANALYSIS

The Ventura County Agricultural Commission has retained the services of architect, Cathy Wilson of Rasmussen and Associates to complete the plans and design the project. The following table comprises the requests outlined in the project narrative (Exhibit 1–Site and Floor plans) for the Agricultural Commissioner Office Building Renovation Phase 3:

Building Element	*Proposed Improvements*
	Window Replacement
Exterior window replacements	Replace existing steel casement windows with aluminum-frame dual-glazed double casement windows that will match the original window design. Windows to be true divided light windows to match original configuration with double out-swinging casement function. Aluminum frame to be painted

	Dunn Edwards Ruddy Oak. Add fixed transom windows above replacement windows. Dunn Edwards Ruddy Oak
	HVAC System Installation
Exterior wall and flooring	Remove existing under floor heater and window mounted air conditioning units and install split system fan coils in attic with ground level condensing units in enclosures within new 5 foot masonry wall on north side of building.
	Roof Structure Upgrade
Roof	Remove the existing clay tile roof to access the roof structure for upgrades, and then reinstall the existing tile back on the roof once the structural roof is completed.
	Proposed Signage
Exterior front wall	New signage "Agricultural Commissioner" in 12-inch stand-off bronze letters



The Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings (The Standards) and Ventura County Cultural Heritage Ordinance Provisions and Findings:

As required by the Cultural Heritage Ordinance, the Standards have been used to review this project and the Cultural Heritage Board's (the Board) review must be based on consistency of the project with them. The Standards are used to determine if the work respects its historic features.

The Standards recommend:

Building Exterior - Windows:

Identifying, retaining and preserving *windows and their functional and decorative features – that are important in defining the overall historic character of the building. Such features can include frames, sash, muntins, glazing, sills, heads, hoodmolds, paneled or decorated jambs and moldings, and interior and exterior shutters.*

Replacing *in kind an entire window that is too deteriorated to repair using the same sash and pane configuration and other design details. If using the same kind of material is not technically or economically feasible when replacing windows deteriorated beyond repair, then a compatible substitute material may be considered.*

Ventura County Cultural Heritage Ordinance Provisions and Findings

The Cultural Heritage Board (CHB) must find that the proposed work satisfies the criteria required by the Cultural Heritage Ordinance No. 4225 to approve the COA:

"The proposed work will not adversely affect the significant architectural features or the character of historical, architectural or aesthetic interest or value of the County landmark and its site."

Staff Comments regarding proposed signage, roof structure upgrade, and HVAC system:

The main character-defining features of the Agricultural Building include the red tile roof, the grand entryway and the steel casement windows. The applicant has assured staff that the proposed signage font, design, and location will match the original signage (as shown on the photo on pages 2 and 3 of this report).

Staff Comments regarding Proposed Replacement Windows:

According to the National Park Service's Preservation Brief 13 – The Repair and Thermal Upgrading of Historic Steel Windows (Exhibit 2 –pg.12):

Repair of historic windows is always preferred within a rehabilitation project. Replacement should be considered only as a last resort.

> *Evaluation of the window should include presence and degree of corrosion, condition of paint, deterioration of the metal sections, including bowing, misalignment of the sash or bent sections, and condition of the glass…..(ibid, pgs. 3 & 4)*

The applicant submitted information on the pros and cons of refurbishment/replacement options and provided photographs of the existing windows showing some corrosion and a lack of putty (Exhibits 3 and 4), however, no evaluation of the condition of the windows was submitted. The preferred option of the owner is the replacement with aluminum windows due to improved energy efficiency of new windows and reduced maintenance costs associated with maintaining steel windows.

The applicant states that without additional energy efficiency, the mechanical design and the enlarged enclosures will result in additional construction costs. According to Preservation Brief 13 – The Repair and Thermal Upgrading of Historic Steel Windows:

> *Metal windows can, however, be made more energy efficient in several ways:*
> - *Caulking around the masonry openings and adding weather-stripping.*
> - *Applying fixed layers of glazing over the historic windows*
> - *Adding storm windows (interior)*
> - *Installing thermal glass in place of existing glass (ibid, pg 9)*

The applicant states that the new aluminum windows will be factory finished in a custom color that will last for decades without the required maintenance of painting steel windows. According to the National Park Service's Preservation Tech Notes– Windows #19- The Repairing Steel Casement Windows (Exhibit 5 –pg.2):

> *New aluminum, wood, or vinyl units would not share the same dimensions, profiles and craftsman-ship of the historic windows.*
>
> *Due to the high structural strength of steel, replacement windows (wood, aluminum, or vinyl) rarely, if ever, can match the narrow members of the original sash. (ibid, pg 7).*

In addition, many online sources state that aluminum is three times weaker than steel, and must be extruded into a boxlike configuration that does not reflect the thin historic profiles of most steel windows.

Staff Comments Regarding with Submittal:

The applicant's submittal lacked:

- Conclusive evidence that the existing windows were beyond repair. The submitted photos of the existing windows showed some rusting and missing putty probably due to poor maintenance.

- Photos of the proposed replacement windows.
- Details of the dimensions, profiles and craftsmanship of the new versus the old windows.

Therefore, staff recommends that the CHB continue the public hearing to allow the applicant to provide staff/CHB with a detailed evaluation of the condition of the existing windows to determine whether some or all of the windows can be saved and to submit photos of the replacement windows to determine if the material is compatible and suitable. Without this evidence, the CHB cannot make the findings to approve the window replacement project.

RECOMMENDATION ACTIONS:

1. CONDUCT public hearing, HEAR testimony, and CONSIDER the staff report;

2. FIND that the improvements, other than the replacement windows meet the requirements of the County Cultural Heritage Ordinance and the Secretary of Interior's Standards; and

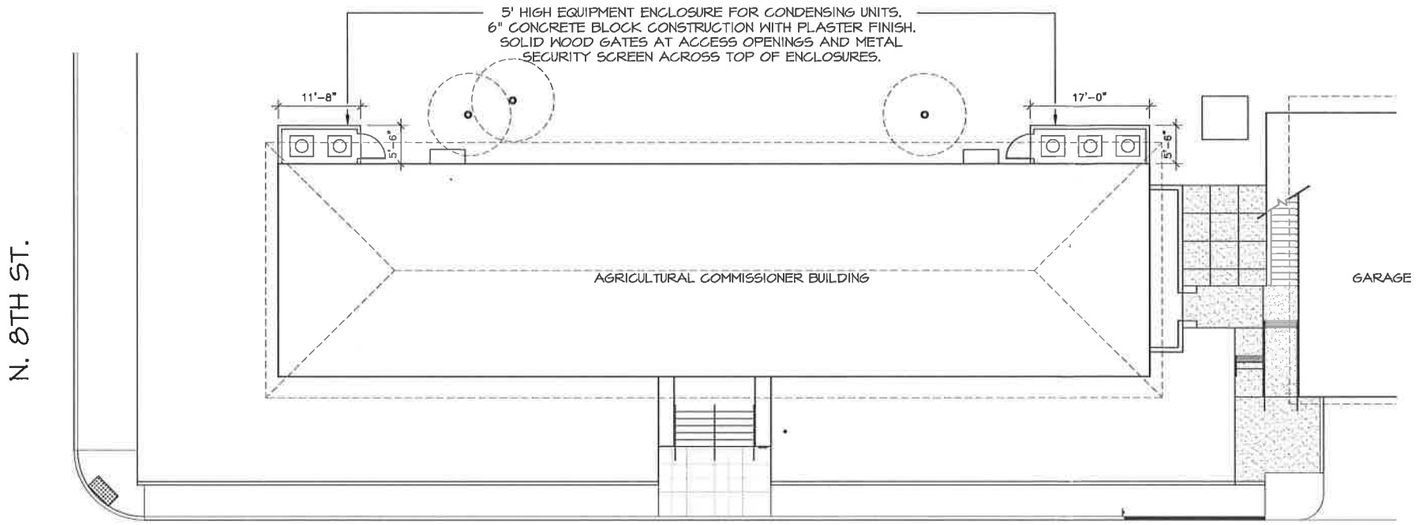
3. Based on the preceding evidence and analysis, APPROVE a Certificate of Appropriateness for the proposed improvements except the replacement windows with any Board recommendations determined necessary to conform to the Standards.

Prepared by:

Nicole Doner, Senior Planner
805-654-5042

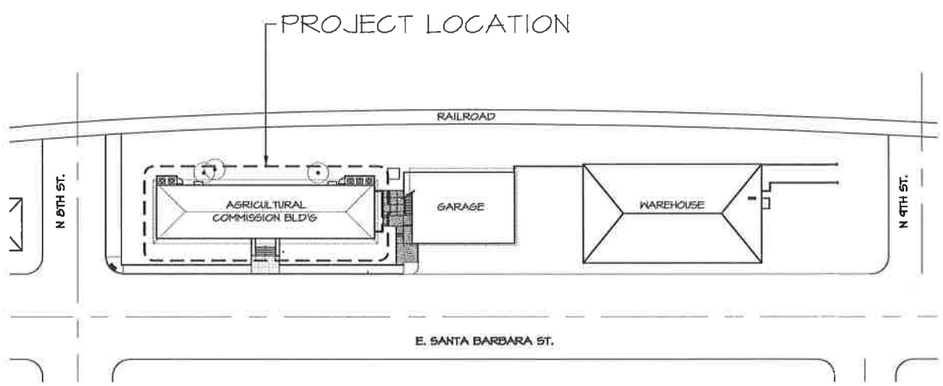
Attachments:

Exhibit 1: Site and Floor Plans
Exhibit 2: Preservation Brief No. 13
Exhibit 3: Pros and Cons of Window Replacement/Refurbishment
Exhibit 4: Photographs of Existing Windows
Exhibit 5: Preservation Tech Notes #19 Repairing Steel Casement Windows



SITE PLAN

SCALE 1" = 10'-0"



MASTER SITE KEY PLAN

SCALE 1" = 40'-0"

SCOPE OF WORK

FINAL PHASE OF IMPROVEMENTS FOR EXISTING OFFICE BUILDING.

1. REMOVE EXISTING UNDER FLOOR HEATER AND WINDOW MOUNTED A.C. UNITS AND INSTALL SPLIT SYSTEM FAN COILS IN ATTIC WITH GROUND-LEVEL CONDENSING UNITS IN ENCLOSURES ON NORTHSIDE OF BUILDING.
2. REPLACE EXISTING STEEL CASEMENT WINDOWS WITH ALUMINUM FRAME CASEMENT WINDOWS.
3. REMOVE AND SALVAGE EXISTING CLAY ROMAN TILE ROOFING. REPLACE SHEATHING AND REINSTALL ORIGINAL CLAY ROMAN TILE ROOFING.

EXHIBIT 1

VENTURA COUNTY AGRICULTURAL COMMISSIONER OFFICE

815 E. SANTA BARBARA STREET, SANTA PAULA CA. 93060

DECEMBER 6, 2012

RASMUSSEN & ASSOCIATES
Architecture
Planning
Interiors

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VENTURA, CA 93001
VOICE: (805) 648-1234
FAX: (805) 648-4444
CONTACT: ...

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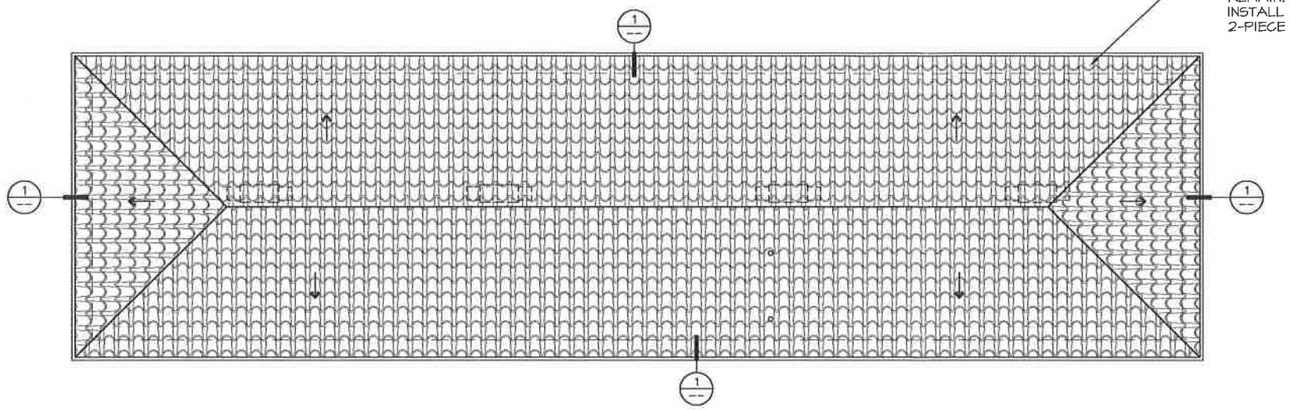
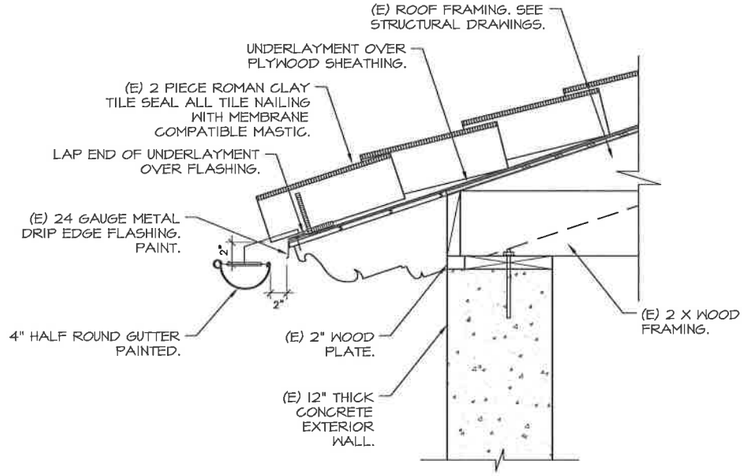


REMOVE EXISTING CLAY ROMAN 2-PIECE TILE ROOFING
REMOVE EXISTING 1X BOARD SHEATHING AND REPLACE WITH 5/8" PLYWOOD. AT OVERHANGING EAVES, EXISTING 1X BOARDS TO REMAIN. EXISTING RAFTERS AND RIDGE BOARDS TO REMAIN. INSTALL UNDERLAYMENT THEN RE-INSTALL EXISTING CLAY ROMAN 2-PIECE TILE ROOFING. SEE EAVE DETAIL BELOW.

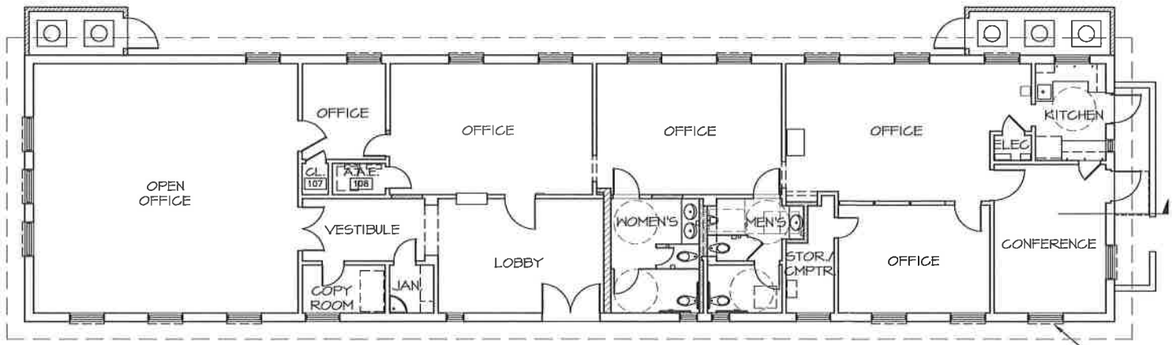
ROOF PLAN

SCALE 1/8" : 1'-0"



1 EAVE DETAIL

SCALE 1-1/2" : 1'-0"



AT ALL EXISTING STEEL CASEMENT WINDOWS, REMOVE ONCE EXISTING AC UNITS HAVE BEEN REMOVED. INSTALL ALUMINUM CASEMENT WINDOWS BY METAL WINDOW CORPORATION, SERIES 1500. WINDOWS TO BE TRUE DIVIDED LIGHT WINDOWS TO MATCH ORIGINAL CONFIGURATION WITH FIXED TRANSOM PANEL AT TOP AND DOUBLE OUTSWINGING CASEMENT FUNCTION BELOW WINDOWS TO BE FACTORY FINISHED, AT THE EXTERIOR AND INTERIOR, TO MATCH DUNN EDWARDS #DE5188 RUDDY OAK.

FLOOR PLAN

SCALE 1/8" : 1'-0"

VENTURA COUNTY AGRICULTURAL COMMISSIONER OFFICE

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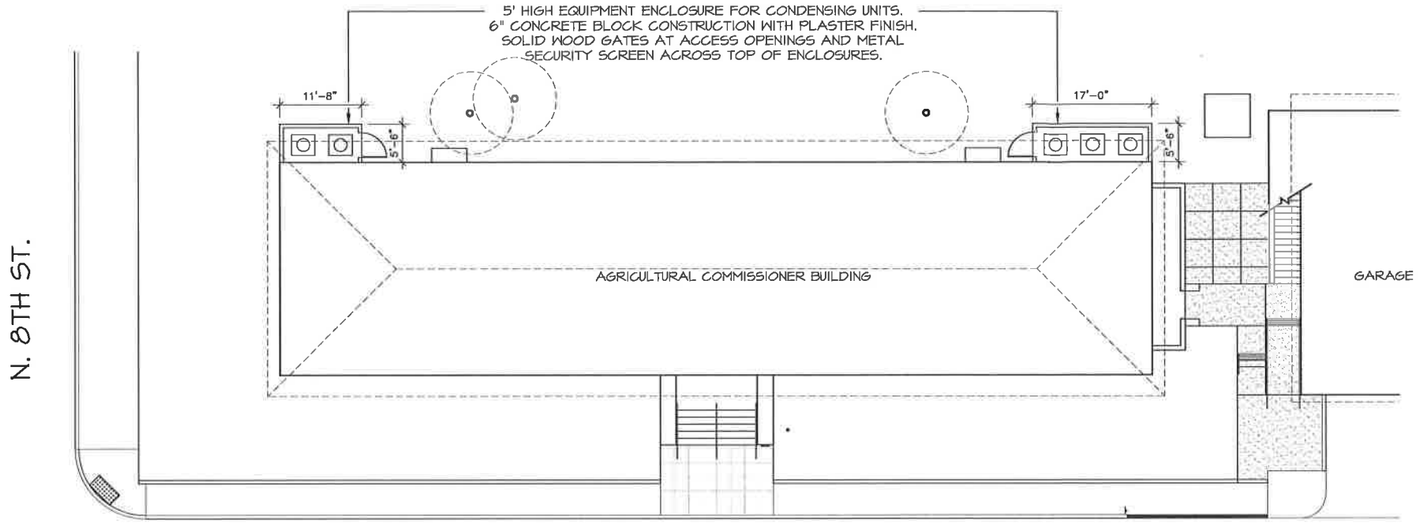

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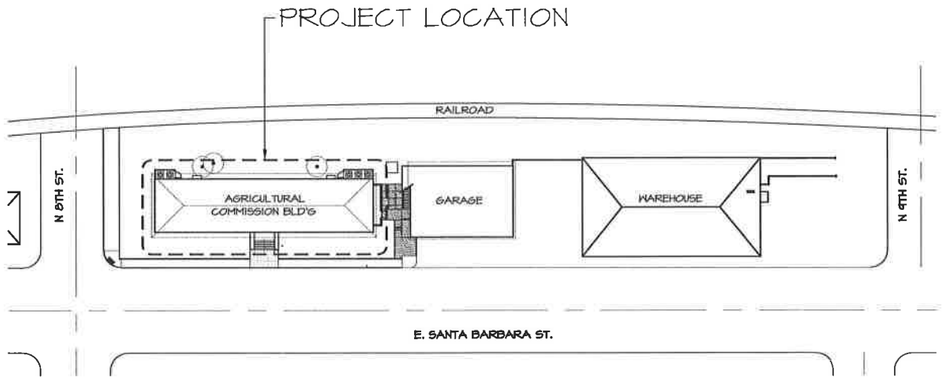

MASTER SITE KEY PLAN

SCALE 1" :40'-0"

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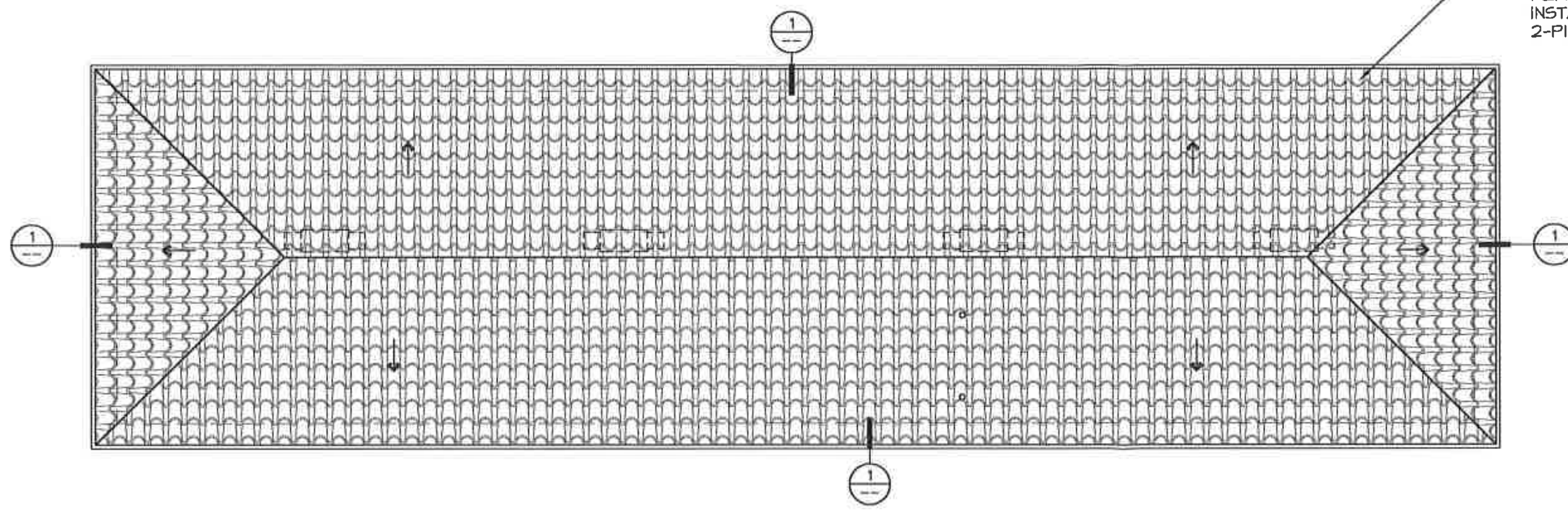
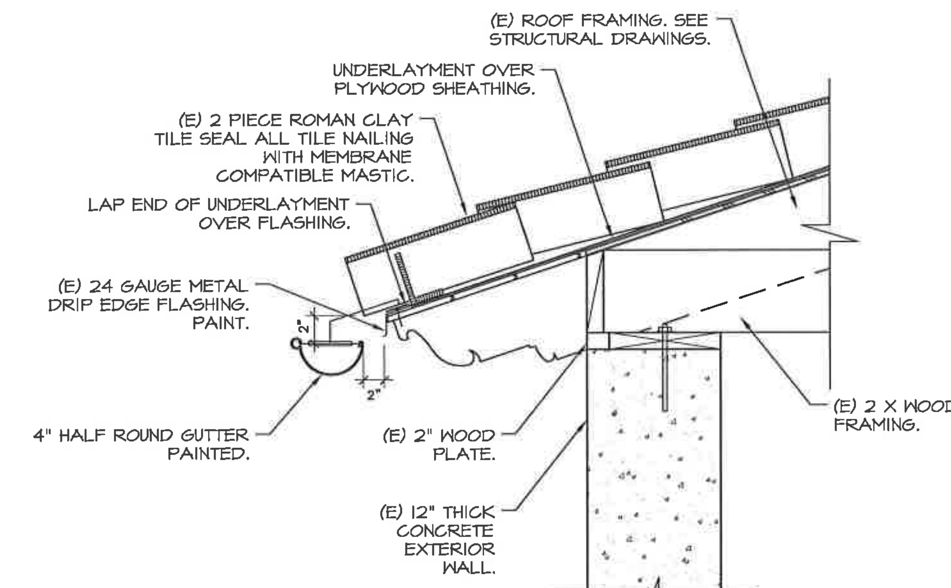


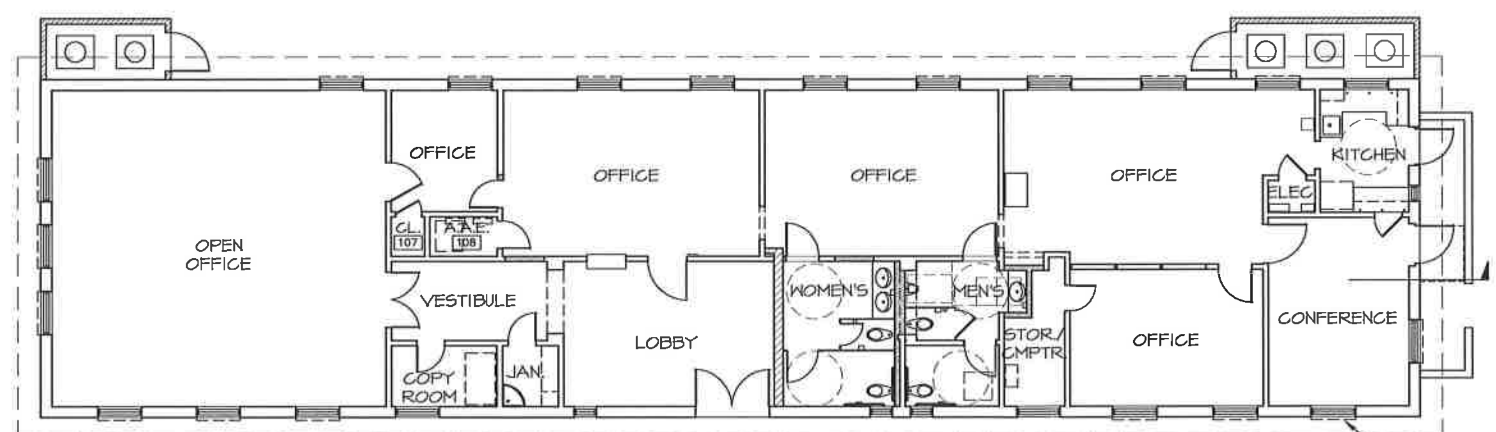
ROOF PLAN

SCALE 1/8" : 1'-0"



1 EAVE DETAIL

SCALE 1-1/2" : 1'-0"



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SCALE 1/8" : 1'-0"

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13 Preservation Briefs

Technical Preservation Services
National Park Service
U.S. Department of the Interior

The Repair and Thermal Upgrading of Historic Steel Windows

Sharon C. Park, AIA

A NOTE TO OUR USERS: The web versions of the **Preservation Briefs** differ somewhat from the printed versions. Many illustrations are new, captions are simplified, illustrations are typically in color rather than black and white, and some complex charts have been omitted.

The Secretary of the Interior's "Standards for Rehabilitation" require that where historic windows are individually significant features, or where they contribute to the character of significant facades, their distinguishing visual qualities must not be destroyed. Further, the rehabilitation guidelines recommend against changing the historic appearance of windows through the use of inappropriate designs, materials, finishes, or colors which radically change the sash, depth of reveal, and muntin configuration; the reflectivity and color of the glazing; or the appearance of the frame.

Windows are among the most vulnerable features of historic buildings undergoing rehabilitation. This is especially the case with rolled steel windows, which are often mistakenly not deemed worthy of preservation in the conversion of old buildings to new uses. The ease with which they can be replaced and the mistaken assumption that they cannot be made energy efficient except at great expense are factors that typically lead to the decision to remove them.

In many cases, however, repair and retrofit of the historic windows are more economical than wholesale replacement, and all too often, replacement units are unlike the originals in design and appearance. If the windows are important in establishing the historic character of the building, insensitively designed replacement windows may diminish--or destroy--the building's

Maintaining historic steel windows for continued use is always recommended. Photo: NPS files.

historic character.

This Brief identifies various types of historic steel windows that dominated the metal window market from 1890-1950. It then gives criteria for evaluating deterioration and for determining appropriate treatment, ranging from routine maintenance and weatherization to extensive repairs, so that replacement may be avoided where possible.(1) This information applies to do-it-yourself jobs and to large rehabilitations where the volume of work warrants the removal of all window units for complete overhaul by professional contractors.

This Brief is not intended to promote the repair of ferrous metal windows in every case, but rather to insure that preservation is always the first consideration in a rehabilitation project. Some windows are not important elements in defining a building's historic character; others are highly significant, but so deteriorated that repair is infeasible. In such cases, the Brief offers guidance in evaluating appropriate replacement windows.

Historical Development

Although metal windows were available as early as 1860 from catalogues published by architectural supply firms, they did not become popular until after 1890. Two factors combined to account for the shift from wooden to metal windows about that time. Technology borrowed from the rolling industry permitted the mass production of rolled steel windows. This technology made metal windows cost competitive with conventional wooden windows. In addition, a series of devastating urban fires in Boston, Baltimore, Philadelphia, and San Francisco led to the enactment of strict fire codes for industrial and multi-story commercial and office buildings.

As in the process of making rails for railroads, rolled steel windows were made by passing hot bars of steel through progressively smaller, shaped rollers until the appropriate angled configuration was achieved. The rolled steel sections, generally 1/8" thick and 1" - 1-1/2" wide, were used for all the components of the windows: sash, frame, and subframe. With the addition of wire glass, a fire-resistant window resulted. These rolled steel windows are almost exclusively found in masonry or concrete buildings.

A by-product of the fire-resistant window was the strong metal frame that permitted the installation of larger windows and windows in series. The ability to have expansive amounts of glass and increased ventilation dramatically changed the designs of late 19th and early 20th century industrial and commercial buildings.

The newly available, reasonably priced steel windows soon became popular for more than just their fire-resistant qualities. They were standardized, extremely durable, and easily transported. These qualities led to the use of steel windows in every type of construction, from simple industrial and institutional buildings to luxury commercial and apartment buildings. Casement, double-hung, pivot, projecting, austral, and continuous windows differed in operating and ventilating capacities. In addition, the thin profiles of

metal windows contributed to the streamlined appearance of the Art Deco, Art Moderne, and International Styles, among others.

The extensive use of rolled steel metal windows continued until after World War II when cheaper, noncorroding aluminum windows became increasingly popular. While aluminum windows dominate the market today, steel windows are still fabricated. Should replacement of original windows become necessary, replacement windows may be available from the manufacturers of some of the earliest steel windows. Before an informed decision can be made whether to repair or replace metal windows, however, the significance of the windows must be determined and their physical condition assessed.

Historic metal windows provide abundant natural light in this rehabilitated industrial space. Photo: NPS files.

Evaluation

Historic and Architectural Considerations

An assessment of the significance of the windows should begin with a consideration of their function in relation to the building's historic use and its historic character. Windows that help define the building's historic character should be preserved even if the building is being converted to a new use. For example, projecting steel windows used to introduce light and an effect of spaciousness to a warehouse or industrial plant can be retained in the conversion of such a building to offices or residences.

Other elements in assessing the relative importance of the historic windows include the design of the windows and their relationship to the scale, proportion, detailing and architectural style of the building. While it may be easy to determine the aesthetic value of highly ornamented windows, or to recognize the importance of streamlined windows as an element of a style, less elaborate windows can also provide strong visual interest by their small panes or projecting planes when open, particularly in simple, unadorned industrial buildings.

One test of the importance of windows to a building is to ask if the overall appearance of the building would be changed noticeably if the windows were to be removed or radically altered. If so, the windows are important in defining the building's historic character, and should be repaired if their physical condition permits.

Physical Evaluation

Steel window repair should begin with a careful evaluation of the physical condition of each unit. Either drawings or photographs, liberally annotated, may be used to record the location of each window, the type of operability, the condition of all three parts--sash, frame and subframe--and the repairs essential to its continued use.

Specifically, the evaluation should include: presence and degree of corrosion; condition of paint; deterioration of the

A severely deteriorated frame, such as this, can be replaced in kind. Photo: Henry Chambers, AIA.

metal sections, including bowing, misalignment of the sash, or bent sections; condition of the glass and glazing compound; presence and condition of all hardware, screws, bolts, and hinges; and condition of the masonry or concrete surrounds, including need for caulking or resetting of improperly sloped sills.

Corrosion, principally rusting in the case of steel windows, is the controlling factor in window repair; therefore, the evaluator should first test for its presence. Corrosion can be light, medium, or heavy, depending on how much the rust has penetrated the metal sections. If the rusting is merely a surface accumulation or flaking, then the corrosion is light. If the rusting has penetrated the metal (indicated by a bubbling texture), but has not caused any structural damage, then the corrosion is medium. If the rust has penetrated deep into the metal, the corrosion is heavy. Heavy corrosion generally results in some form of structural damage, through delamination, to the metal section, which must then be patched or spliced.

A sharp probe or tool, such as an ice pick, can be used to determine the extent of corrosion in the metal. If the probe can penetrate the surface of the metal and brittle strands can be dug out, then a high degree of corrosive deterioration is present.

In addition to corrosion, the condition of the paint, the presence of bowing or misalignment of metal sections, the amount of glass needing replacement, and the condition of the masonry or concrete surrounds must be assessed in the evaluation process. These are key factors in determining whether or not the windows can be repaired in place. The more complete the inventory of existing conditions, the easier it will be to determine whether repair is feasible or whether replacement is warranted.

Rehabilitation Work Plan

Following inspection and analysis, a plan for the rehabilitation can be formulated. The actions necessary to return windows to an efficient and effective working condition will fall into one or more of the following categories: routine maintenance, repair, and weatherization. The routine maintenance and weatherization measures described here are generally within the range of do-it-yourselfers. Other repairs, both moderate and major, require a professional contractor. Major repairs normally require the removal of the window units to a workshop, but even in the case of moderate repairs, the number of windows involved might warrant the removal of all the deteriorated units to a workshop in order to realize a more economical repair price. Replacement of windows should be considered only as a last resort.

Since moisture is the primary cause of corrosion in steel windows, it is essential that excess moisture be eliminated and that the building be made as weathertight as possible before any other work is undertaken. Moisture can accumulate from cracks in the masonry, from spalling mortar, from leaking gutters, from air conditioning condensation runoff, and from poorly ventilated interior spaces.

Finally, before beginning any work, it is important to be aware of health and safety risks involved. Steel windows have historically been coated with lead paint. The removal of such paint by abrasive methods will produce toxic dust. Therefore, safety goggles, a toxic dust respirator, and protective clothing should be worn. Similar protective

measures should be taken when acid compounds are used. Local codes may govern the methods of removing lead paints and proper disposal of toxic residue.

Typical Rolled Steel Windows Available from 1890 to the Present

DOUBLE-HUNG industrial windows duplicated the look of traditional wooden windows. Metal double-hung windows were early examples of a building product adapted to meet stringent new fire code requirements for manufacturing and high-rise buildings in urban areas. Soon supplanted in industrial buildings by less expensive pivot windows, double-hung metal windows regained popularity in the 1940s for use in speculative suburban housing.

PIVOT windows were an early type of industrial window that combined inexpensive first cost and low maintenance. Pivot windows became standard for warehouses and power plants where the lack of screens was not a problem. The window shown here is a horizontal pivot. Windows that turned about a vertical axis were also manufactured (often of iron). Such vertical pivots are rare today.

PROJECTING windows, sometimes called awning or hopper windows, were perfected in the 1920s for industrial and institutional buildings. They were often used in "combination" windows, in which upper panels opened out and lower panels opened in. Since each movable panel projected to one side of the frame only, unlike pivot windows, for example, screens could be introduced.

AUSTRAL windows were also a product of the 1920s. They combined the appearance of the double-hung window with the increased ventilation and ease of operation of the projected window. (When fully opened, they provided 70% ventilation as compared to 50% ventilation for double-hung windows.) Austral windows were often used in schools, libraries and other public buildings.

CASEMENT windows adapted the English tradition of using wrought iron casements with leaded cames for residential use. Rolled steel casements (either single, as shown, or paired) were popular in the 1920s for cottage style residences and Gothic style campus architecture. More streamlined casements were popular in the 1930s for institutional and small industrial buildings.

CONTINUOUS windows were almost exclusively used for industrial buildings requiring high overhead lighting. Long runs of clerestory windows operated by mechanical tension rod gears were typical. Long banks of continuous windows were possible because the frames for such windows were often structural elements of the building.

Routine Maintenance

A preliminary step in the routine maintenance of steel windows is to remove surface dirt and grease in order to ascertain the degree of deterioration, if any. Such minor cleaning can be accomplished using a brush or vacuum followed by wiping with a cloth dampened with mineral spirits or denatured alcohol.

If it is determined that the windows are in basically sound condition, the following steps can be taken: 1) removal of light rust, flaking and excessive paint; 2) priming of exposed metal with a rust-inhibiting primer; 3) replacement of cracked or broken glass and glazing compound; 4) replacement of missing screws or fasteners; 5) cleaning and lubrication of hinges; 6) repainting of all steel sections with two coats of finish paint compatible with the primer; and 7) caulking the masonry surrounds with a high quality elastomeric caulk.

Recommended methods for removing light rust include manual and mechanical abrasion or the application of chemicals. Burning off rust with an oxyacetylene or propane torch, or an inert gas welding gun, should never be attempted because the heat can distort the metal. In addition, such intense heat (often as high as 3800 deg. F) vaporizes the lead in old paint, resulting in highly toxic fumes. Furthermore, such heat will likely result in broken glass. Rust can best be removed using a wire brush, an aluminum oxide sandpaper, or a variety of power tools adapted for abrasive cleaning such as an electric drill with a wire brush or a rotary whip attachment. Adjacent sills and window jambs may need protective shielding.

Rust can also be removed from ferrous metals by using a number of commercially prepared anticorrosive acid compounds. Effective on light and medium corrosion, these compounds can be purchased either as liquids or gels. Several bases are available, including phosphoric acid, ammonium citrate, oxalic acid and hydrochloric acid. Hydrochloric acid is generally not recommended; it can leave chloride deposits, which cause future corrosion. Phosphoric acid-based compounds do not leave such deposits, and are therefore safer for steel windows. However, any chemical residue should be wiped off with damp cloths, then dried immediately. Industrial blow-dryers work well for thorough drying. The use of running water to remove chemical residue is never recommended because the water may spread the chemicals to adjacent surfaces, and drying of these surfaces may be more difficult. Acid cleaning compounds will stain masonry; therefore plastic sheets should be taped to the edge of the metal sections to protect the masonry surrounds. The same measure should be followed to protect the glazing from etching because of acid contact.

The historic steel sash is shown in place, prior to its removal and replacement with inappropriate aluminum sash (see below). Photo: NPS files.

Measures that remove rust will ordinarily remove flaking paint as well. Remaining loose or flaking paint can be removed with a chemical paint remover or with a pneumatic needle scaler or gun, which comes with a series of chisel blades and has proven effective in removing flaking paint from metal windows. Well-bonded paint may serve to protect the metal further from corrosion, and need not be removed unless paint buildup prevents the window from closing tightly. The edges should be feathered by sanding to give a good surface for repainting.

Next, any ***bare*** metal should be wiped with a cleaning solvent such as denatured alcohol, and dried immediately in preparation for the application of an anticorrosive primer. Since corrosion can recur very soon after metal has been exposed to the air, the metal should be primed immediately after cleaning. Spot priming may be required periodically as other repairs are undertaken. Anticorrosive primers generally consist of oil-alkyd based paints rich in zinc or zinc chromate.(2) Red lead is no longer available because of its toxicity. All metal primers, however, are toxic to some degree and should be handled carefully. Two coats of primer are recommended.

Manufacturer's recommendations should be followed concerning application of primers.

Repair

Repair in Place

The maintenance procedures described above will be insufficient when corrosion is extensive, or when metal window sections are misaligned. Medium to heavy corrosion that has not done any structural damage to the metal sections can be removed either by using the chemical cleaning process described under "Routine Maintenance" or by sandblasting. Since sandblasting can damage the masonry surrounds and crack or cloud the glass, metal or plywood shields should be used to protect these materials. The sandblasting pressure should be low, 80-100 pounds per square inch, and the grit size should be in the range of #10-#45. Glass peening beads (glass pellets) have also been successfully used in cleaning steel sections. While sandblasting equipment comes with various nozzle sizes, pencil-point blasters are most useful because they give the operator more effective control over the direction of the spray. The small aperture of the pencil-point blaster is also useful in removing dried putty from the metal sections that hold the glass. As with any cleaning technique, once the bare metal is exposed to air, it should be primed as soon as possible. This includes the inside rabbeted section of sash where glazing putty has been removed. To reduce the dust, some local codes allow only wet blasting. In this case, the metal must be dried immediately, generally with a blowdrier (a step that the owner should consider when calculating the time and expense involved). Either form of sandblasting metal covered with lead paints produces toxic dust. Proper precautionary measures should be taken against toxic dust and silica particles.

Bent or bowed metal sections may be the result of damage to the window through an impact or corrosive expansion. If the distortion is not too great, it is possible to re-align the metal sections without removing the window to a metal fabricator's shop. The glazing is generally removed and pressure is applied to the bent or bowed section. In the case of a muntin, a protective 2 x 4 wooden bracing can be placed behind the bent portion and a wire cable with a winch can apply progressively more pressure over several days until the section is realigned. The 2 x 4 bracing is necessary to distribute the pressure evenly over the damaged section. Sometimes a section, such as the bottom of the frame, will bow out as a result of pressure exerted by corrosion and it is often necessary to cut the metal section to relieve this pressure prior to pressing the section back into shape and making a welded repair.

The historic steel sash (see photo above) was removed and replaced with modern aluminum sash, resulting in a negative visual impact on the building's historic character. Photo: NPS files.

Once the metal sections have been cleaned of all corrosion and straightened, small holes and uneven areas resulting from rusting should be filled with a patching material and sanded smooth to eliminate pockets where water can accumulate. A patching material of steel fibers and an epoxy binder may be the easiest to apply. This steel-based epoxy is

available for industrial steel repair; it can also be found in auto body patching compounds or in plumber's epoxy. As with any product, it is important to follow the manufacturer's instructions for proper use and best results. The traditional patching technique--melting steel welding rods to fill holes in the metal sections--may be difficult to apply in some situations; moreover, the window glass must be removed during the repair process, or it will crack from the expansion of the heated metal sections. After these repairs, glass replacement, hinge lubrication, painting, and other cosmetic repairs can be undertaken as necessary.

To complete the checklist for routine maintenance, cracked glass, deteriorated glazing compound, missing screws, and broken fasteners will have to be replaced; hinges cleaned and lubricated; the metal windows painted, and the masonry surrounds caulked. If the glazing must be replaced, all clips, glazing beads, and other fasteners that hold the glass to the sash should be retained, if possible, although replacements for these parts are still being fabricated. When bedding glass, use only glazing compound formulated for metal windows. To clean the hinges (generally brass or bronze), a cleaning solvent and fine bronze wool should be used. The hinges should then be lubricated with a non-greasy lubricant specially formulated for metals and with an anticorrosive agent. These lubricants are available in a spray form and should be used periodically on frequently opened windows.

Final painting of the windows with a paint compatible with the anticorrosive primer should proceed on a dry day. (Paint and primer from the same manufacturer should be used.) Two coats of finish paint are recommended if the sections have been cleaned to bare metal. The paint should overlap the glass slightly to insure weathertightness at that connection. Once the paint dries thoroughly, a flexible exterior caulk can be applied to eliminate air and moisture infiltration where the window and the surrounding masonry meet.

Caulking is generally undertaken after the windows have received at least one coat of finish paint. The perimeter of the masonry surround should be caulked with a flexible elastomeric compound that will adhere well to both metal and masonry. The caulking used should be a type intended for exterior application, have a high tolerance for material movement, be resistant to ultraviolet light, and have a minimum durability of 10 years. Three effective compounds (taking price and other factors into consideration) are polyurethane, vinyl acrylic, and butyl rubber. In selecting a caulking material for a window retrofit, it is important to remember that the caulking compound may be covering other materials in a substrate. In this case, some compounds, such as silicone, may not adhere well. Almost all modern caulking compounds can be painted after curing completely. Many come in a range of colors, which eliminates the need to paint. If colored caulking is used, the windows should have been given two coats of finish paint prior to caulking.

Repair in Workshop

Damage to windows may be so severe that the window sash and sometimes the frame must be removed for cleaning and extensive rust removal, straightening of bent sections, welding or splicing in of new sections, and reglazing. These major and expensive repairs are reserved for highly significant windows that cannot be replaced; the procedures involved should be carried out only by skilled workmen.

As part of the orderly removal of windows, each window should be numbered and the parts labeled. The operable metal sash should be dismantled by removing the hinges; the fixed sash and, if necessary, the frame can then be unbolted or unscrewed. (The

subframe is usually left in place. Built into the masonry surrounds, it can only be cut out with a torch.) Hardware and hinges should be labeled and stored together.

The two major choices for removing flaking paint and corrosion from severely deteriorated windows are dipping in a chemical bath or sandblasting. Both treatments require removal of the glass. If the windows are to be dipped, a phosphoric acid solution is preferred, as mentioned earlier. While the dip tank method is good for fairly evenly distributed rust, deep set rust may remain after dipping. For that reason, sandblasting is more effective for heavy and uneven corrosion. Both methods leave the metal sections clean of residual paint. As already noted, after cleaning has exposed the metal to the air, it should be primed immediately after drying with an anticorrosive primer to prevent rust from recurring.

Sections that are seriously bent or bowed must be straightened with heat and applied pressure in a workshop. Structurally weakened sections must be cut out, generally with an oxyacetylene torch, and replaced with sections welded in place and the welds ground smooth. Finding replacement metal sections, however, may be difficult. While most rolling mills are producing modern sections suitable for total replacement, it may be difficult to find an exact profile match for a splicing repair. The best source of rolled metal sections is from salvaged windows, preferably from the same building. If no salvaged windows are available, two options remain. Either an ornamental metal fabricator can weld flat plates into a built-up section, or a steel plant can mill bar steel into the desired profile.

While the sash and frame are removed for repair, the subframe and masonry surrounds should be inspected. This is also the time to reset sills or to remove corrosion from the subframe, taking care to protect the masonry surrounds from damage.

Missing or broken hardware and hinges should be replaced on all windows that will be operable. Salvaged windows, again, are the best source of replacement parts. If matching parts cannot be found, it may be possible to adapt ready-made items. Such a substitution may require filling existing holes with steel epoxy or with plug welds and tapping in new screw holes. However, if the hardware is a highly significant element of the historic window, it may be worth having reproductions made.

Weatherization

Historic metal windows are generally not energy efficient; this has often led to their wholesale replacement. Metal windows can, however, be made more energy efficient in several ways, varying in complexity and cost. Caulking around the masonry openings and adding weatherstripping, for example, can be do-it-yourself projects and are important first steps in reducing air infiltration around the windows. They usually have a rapid payback period. Other treatments include applying fixed layers of glazing over the historic windows, adding operable storm windows, or installing thermal glass in place of the existing glass. In combination with caulking and weatherstripping, these treatments can produce energy ratings rivaling those achieved by new units.(3)

Weatherstripping

The first step in any weatherization program, caulking, has been discussed above under "Routine Maintenance." The second step is the installation of weatherstripping where the operable portion of the sash, often called the ventilator, and the fixed frame come

together to reduce perimeter air infiltration. Four types of weatherstripping appropriate for metal windows are spring-metal, vinyl strips, compressible foam tapes, and sealant beads. The spring-metal, with an integral friction fit mounting clip, is recommended for steel windows in good condition. The clip eliminates the need for an applied glue; the thinness of the material insures a tight closure. The weatherstripping is clipped to the inside channel of the rolled metal section of the fixed frame. To insure against galvanic corrosion between the weatherstripping (often bronze or brass), and the steel window, the window must be painted prior to the installation of the weatherstripping. This weatherstripping is usually applied to the entire perimeter of the window opening, but in some cases, such as casement windows, it may be best to avoid weatherstripping the hinge side. The natural wedging action of the weatherstripping on the three sides of the window often creates an adequate seal.

Vinyl weatherstripping can also be applied to metal windows. Folded into a "V" configuration, the material forms a barrier against the wind. Vinyl weatherstripping is usually glued to the frame, although some brands have an adhesive backing. As the vinyl material and the applied glue are relatively thick, this form of weatherstripping may not be appropriate for all situations.

Compressible foam tape weatherstripping is often best for large windows where there is a slight bending or distortion of the sash. In some very tall windows having closure hardware at the sash midpoint, the thin sections of the metal window will bow away from the frame near the top. If the gap is not more than 1/4", foam weatherstripping can normally fill the space. If the gap exceeds this, the window may need to be realigned to close more tightly. The foam weatherstripping comes either with an adhesive or plain back; the latter variety requires application with glue. Compressible foam requires more frequent replacement than either spring-metal or vinyl weatherstripping.

A fourth type of successful weatherstripping involves the use of a caulking or sealant bead and a polyethylene bond breaker tape. After the window frame has been thoroughly cleaned with solvent, permitted to dry, and primed, a neat bead of low modulus (firm setting) caulk, such as silicone, is applied. A bond breaker tape is then applied to the operable sash covering the metal section where contact will occur. The window is then closed until the sealant has set (27 days, depending on temperature and humidity). When the window is opened, the bead will have taken the shape of the air infiltration gap and the bond breaker tape can be removed. This weatherstripping method appears to be successful for all types of metal windows with varying degrees of air infiltration.

Since the several types of weatherstripping are appropriate for different circumstances, it may be necessary to use more than one type on any given building. Successful weatherstripping depends upon using the thinnest material adequate to fill the space through which air enters. Weatherstripping that is too thick can spring the hinges, thereby resulting in more gaps.

Appropriate Types of Weatherstripping for Metal Windows

SPRING-METAL comes in bronze, brass or stainless steel with an integral friction fit clip. The weatherstripping is applied after the repaired windows are painted to avoid galvanic corrosion. This type of thin weatherstripping is intended for windows in good condition.

VINYL STRIPS are scored and fold into a "V" configuration. Applied adhesive is

necessary which will increase the thickness of the weatherstripping, making it inappropriate for some situations. The weatherstripping is generally applied to the window after painting.

Closed cell **FOAM TAPE** comes either with or without an adhesive backing. It is effective for windows with a gap of approximately 1/4" and is easy to install. However, this type of weatherstripping will need frequent replacement on windows in regular use. The metal section should be cleaned of all dirt and grease prior to its application.

SEALANT BEAD. This very effective type of weatherstripping involves the application of a clean bead of firm setting caulk on the primed frame with a polyethelene bond breaker tape on the operable sash. The window is then closed until the bead has set and takes the form of the gap. The sash is then opened and the tape is removed leaving the set caulk as the weatherstripping.

Thermal Glazing

Historic steel sash can be fitted with dual glazing to improve thermal efficiency. Photo: NPS files.

The third weatherization treatment is to install an additional layer of glazing to improve the thermal efficiency of the existing window. The decision to pursue this treatment should proceed from careful analysis. Each of the most common techniques for adding a layer of glazing will effect approximately the same energy savings (approximately double the original insulating value of the windows); therefore, cost and aesthetic considerations usually determine the choice of method. Methods of adding a layer of glazing to improve thermal efficiency include adding a new layer of transparent material to the window; adding a separate storm window; and replacing the single layer of glass in the window with thermal glass.

The least expensive of these options is to install a clear material (usually rigid sheets of acrylic or glass) over the original window. The choice between acrylic and glass is generally based on cost, ability of the window to support the material, and long-term maintenance outlook. If the material is placed over the entire window and secured to the frame, the sash will be inoperable. If the continued use of the window is important (for ventilation or for fire exits), separate panels should be affixed to the sash without obstructing operability. Glass or acrylic panels set in frames can be attached using magnetized gaskets, interlocking material strips, screws or adhesives. Acrylic panels can be screwed directly to the metal windows, but the holes in the acrylic panels should allow for the expansion and contraction of this material. A compressible gasket between the prime sash and the storm panel can be very effective in establishing a thermal cavity between glazing layers. To avoid condensation, 1/8" cuts in a top corner and diagonally opposite bottom corner of the gasket will provide a vapor bleed, through which moisture can evaporate. (Such cuts, however, reduce thermal performance slightly.) If condensation does occur, however, the panels should be easily removable in order to wipe away moisture before it causes corrosion.

The second method of adding a layer of glazing is to have independent storm windows fabricated. (Pivot and austral windows, however, which project on either side of the

window frame when open, cannot easily be fitted with storm windows and remain operational.) The storm window should be compatible with the original sash configuration. For example, in paired casement windows, either specially fabricated storm casement windows or sliding units in which the vertical meeting rail of the slider reflects the configuration of the original window should be installed. The decision to place storm windows on the inside or outside of the window depends on whether the historic window opens in or out, and on the visual impact the addition of storm windows will have on the building. Exterior storm windows, however, can serve another purpose besides saving energy: they add a layer of protection against air pollutants and vandals, although they will partially obscure the prime window. For highly ornamental windows this protection can determine the choice of exterior rather then interior storm windows.

The third method of installing an added layer of glazing is to replace the original single glazing with thermal glass. Except in rare instances in which the original glass is of special interest (as with stained or figured glass), the glass can be replaced if the hinges can tolerate the weight of the additional glass. The rolled metal sections for steel windows are generally from 1" 1-1/2" thick. Sash of this thickness can normally tolerate thermal glass, which ranges from 3/8" 5/8". (Metal glazing beads, readily available, are used to reinforce the muntins, which hold the glass.) This treatment leaves the window fully operational while preserving the historic appearance. It is, however, the most expensive of the treatments discussed here.

Window Replacement

Repair of historic windows is always preferred within a rehabilitation project. Replacement should be considered only as a last resort. However, when the extent of deterioration or the unavailability of replacement sections renders repair impossible, replacement of the entire window may be justified.

In the case of significant windows, replacement in kind is essential in order to maintain the historic character of the building. However, for less significant windows, replacement with compatible new windows may be acceptable. In selecting compatible replacement windows, the material, configuration, color, operability, number and size of panes, profile and proportion of metal sections, and reflective quality of the original glass should be duplicated as closely as possible.

This is a successsful replacement in kind of the deteriorated frame shown above. Photo: Henry Chambers, AIA.

A number of metal window manufacturing companies produce rolled steel windows. While stock modern window designs do not share the multi-pane configuration of historic windows, most of these manufacturers can reproduce the historic configuration if requested, and the cost is not excessive for large orders. Some manufacturers still carry the standard pre-World War II multi-light windows using the traditional 12" x 18" or 14" x 20" glass sizes in industrial, commercial, security, and residential configurations. In addition, many of the modern steel windows have integral weatherstripping, thermal break construction, durable vinyl coatings, insulating glass, and other desirable features.

Windows manufactured from other materials generally cannot match the thin profiles of the rolled steel sections. Aluminum, for example, is three times weaker than steel and must be extruded into a boxlike configuration that does not reflect the thin historic profiles of most steel windows. Wooden and vinyl replacement windows generally are not fabricated in the industrial style, nor can they reproduce the thin profiles of the rolled steel sections, and consequently are generally not acceptable replacements.

For product information on replacement windows, the owner, architect, or contractor should consult manufacturers' catalogues, building trade journals, or the Steel Window Institute, 1230 Keith Building, Cleveland, Ohio 44115.

Summary

The National Park Service recommends the retention of significant historic metal windows whenever possible. Such windows, which can be a character-defining feature of a historic building, are too often replaced with inappropriate units that impair rather than complement the overall historic appearance. The repair and thermal upgrading of historic steel windows is more practicable than most people realize. Repaired and properly maintained metal windows have greatly extended service lives. They can be made energy efficient while maintaining their contribution to the historic character of the building.

NOTES

(1) The technical information given in this brief is intended for most ferrous (or magnetic) metals, particularly rolled steel. While stainless steel is a ferrous metal, the cleaning and repair techniques outlined here must not be used on it as the finish will be damaged. For information on cleaning stainless steel and nonferrous metals, such as bronze, Monel, or aluminum, refer to *Metals in America's Historic Buildings* (see bibliography).

(2) Refer to Table IV. Types of Paint Used for Painting Metal in Metals in America's Historic Buildings, p. 139. (See bibliography).

(3) One measure of energy efficiency is the U-value (the number of BTUs per hour transferred through a square foot of material). The lower the U-value, the better the performance. According to *ASHRAE HANDBOOK 1977 Fundamentals*, the U-value of historic rolled steel sash with single glazing is 1.3. Adding storm windows to the existing units or reglazing with 5/8" insulating glass produces a U-value of .69. These methods of weatherizing historic steel windows compare favorably with rolled steel replacement alternatives: with factory installed 1" insulating glass (.67 U-value); with added thermal break construction and factory finish coatings (.62 U-value).

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Washington, D. C. September, 1984

Home page logo: Metal casement window from "Hope's Metal Windows and Casements, 1818-1926." Photo: Courtesy, Hope's Windows, Inc.

This publication has been prepared pursuant to the National Historic Preservation Act of 1966, as amended, which directs the Secretary of the Interior to develop and make available information concerning historic properties. Technical Preservation Services (TPS), Heritage Preservation Services Division, National Park Service prepares standards, guidelines, and other educational materials on responsible historic preservation treatments for a broad public.

Ventura County Agricultural Commissioner's Office APN 103-0-072-035
Steel Window Replacement
1/17/13

Existing Condition:

Original steel double casement windows are single glazed, over eighty years old, and have had their original upper hopper window removed in order to install individual AC units. The County is proposing to upgrade the heating and cooling system at the building and will be removing those individual AC units. The windows must be addressed because of the opening that will be left in the window. The Owner prefers to replace the windows but has been informed that the Cultural Heritage Board may prefer that the original windows remain.

There are twenty-two 48"x60" windows and four 24"x48" windows.

Option #1 : Refurbish existing windows

Pros:

- Will maintain the original appearance of the building.
- Is the preferred option of the Cultural Heritage Board.
- Limits collateral damage to the existing concrete walls.

Cons:

- Glazing will remain as single pane. It is not possible to retrofit the existing windows with dual glazing. This will work against the energy efficiency of the windows and will result in two additional mechanical units than if the windows were dual glazed. The proposed equipment enclosures at the north side of the building will increase in size to accommodate those additional units. The effect on the mechanical design and the enlarged enclosures will result in additional construction cost. There is also the potential for an increase in the electrical service required. On a continued basis, there will be an increase in monthly cooling/heating costs.
- The quoted cost for refurbishing the windows is approximately $3,000 - $3,500 per window. This would include installing a new fixed window at the original hopper location. The windows would receive new putty and the paint and putty would be abated.
- Windows will need to be painted which will be a continuous maintenance issue.
- Putty glazed windows will be a continuous maintenance issue. Currently when a single pane of glass is damaged (broken by a thrown rock) the pane is replaced and new putty is installed. These locations have a noticeably different look. Broken glass is a ongoing problem.
- There is not a successful way to fabricate and reinstall a hopper window for the upper portion. There is not a way to match the dimension of the

roll form steel and the hardware. The hopper will not match the rest of the window and a good seal will not be possible.

Option #2: Replace with aluminum windows (Option preferred by the Owner)

Pros:

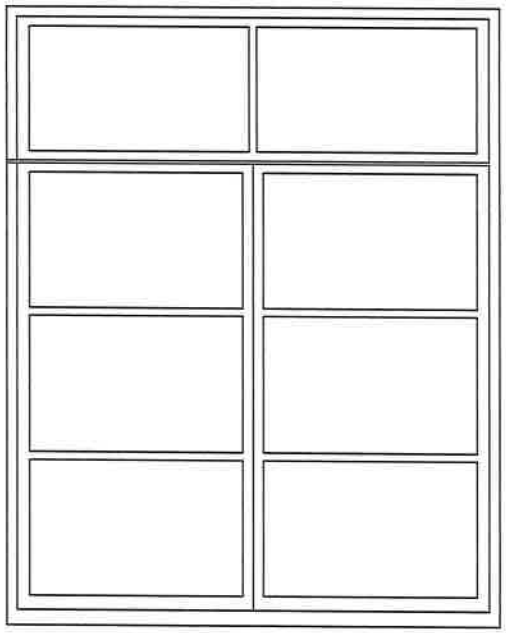
- The window configuration will match the existing: double casement with a fixed transom above. There is the possibility to have a functioning hopper window be installed above the casements if the Cultural Heritage Board desires. It is the preference of the Owner to have fixed windows above the casements.
- Dual paned windows will improve the building efficiency and two less mechanical units will be required. There will be a cost savings from a construction standpoint and from a monthly operating cost standpoint.
- Cost is $1600 per window installed. This includes the removal/abatement of the existing window.
- The windows will be factory finished in a custom color that will last for decades and no paint will be required.
- The glass will have snap in mullions and not require putty. When glass is replaced it will look identical to the remaining panes.
- Windows will have true divided lights.

Cons:

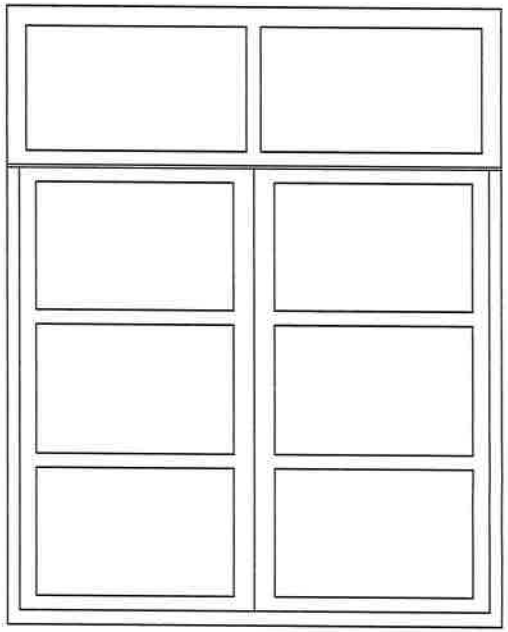
- Will affect the appearance of the building slightly. Most noticeable will be the divided light muntins which are twice the thickness of the existing steel (1-3/8" vs. ¾").
- The Cultural Heritage Board is not in favor of this option. They prefer that existing windows remain whenever possible. The Planner working on this project could not say whether the CHB will have any preference on whether the upper window is installed with a hopper or a fixed window. The CHB may not like the look of dual panes.
- Collateral damage to the existing concrete walls.

VENTURA COUNTY AGRICULTURAL COMMISSIONER
OFFICE BUILDING, SANTA PAULA

1/17/13



EXISTING STEEL



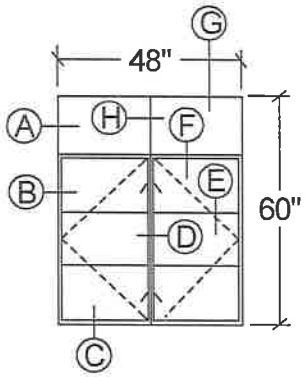
REPLACEMENT ALUMINUM

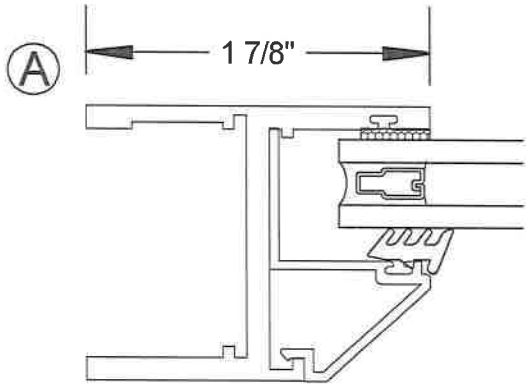
ALUMINUM

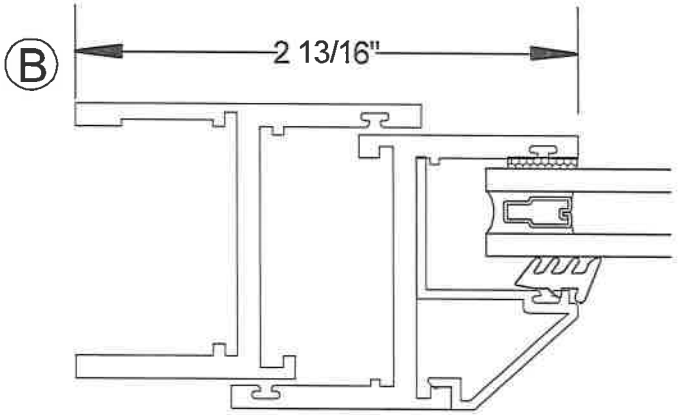
Rasmussen & Assoc.
Cathy Wilson

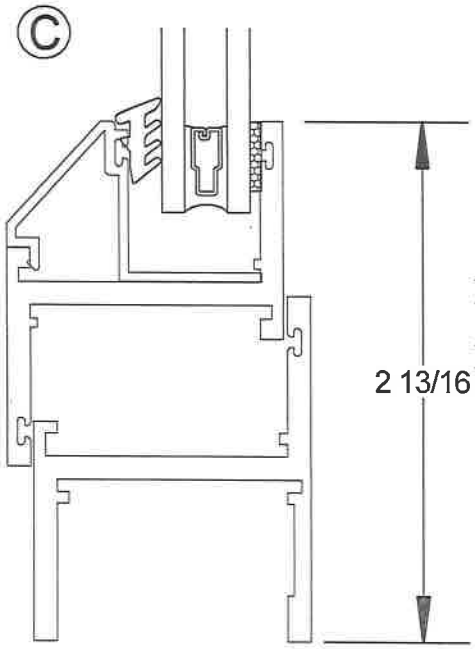
1500 SERIES EQUAL LEG FRAME
1/2" DUAL CLEAR GLASS WITH SLOPE STOPS.

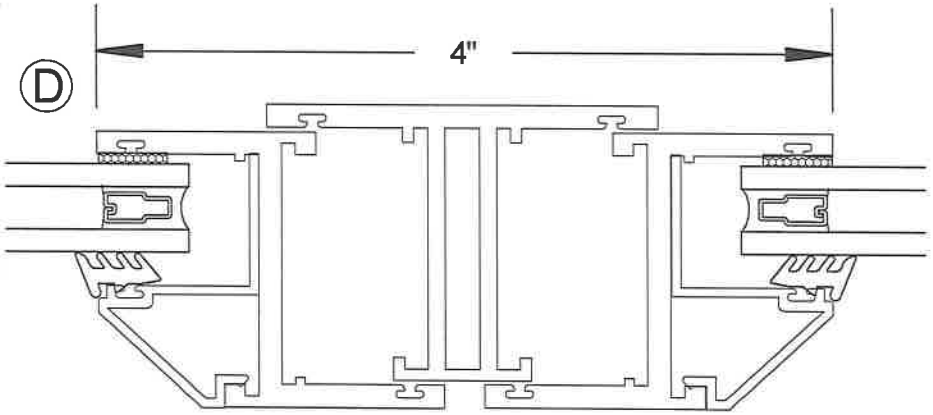
1/11/13

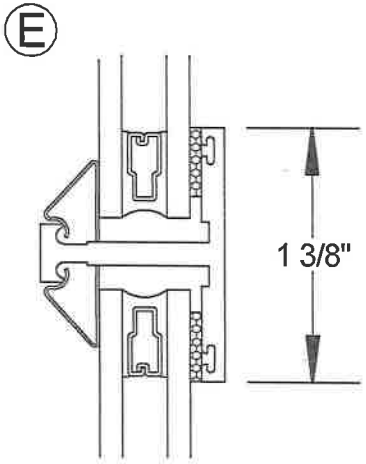












No testing for SHGC and U-values on 1/2" IG Glass.

When using sloped rollform bead on 1 3/8" muntin bars and 1/2" dual glass, bead will not fully cover spacer between the dual glass on the exterior side. Spacers between glass "will" cover from interior. Dark bronze spacers are recommended.

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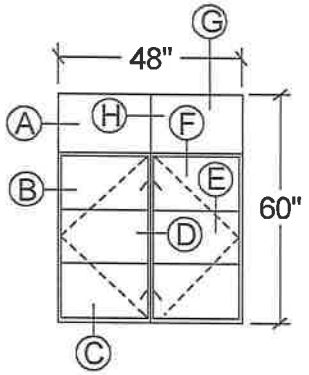
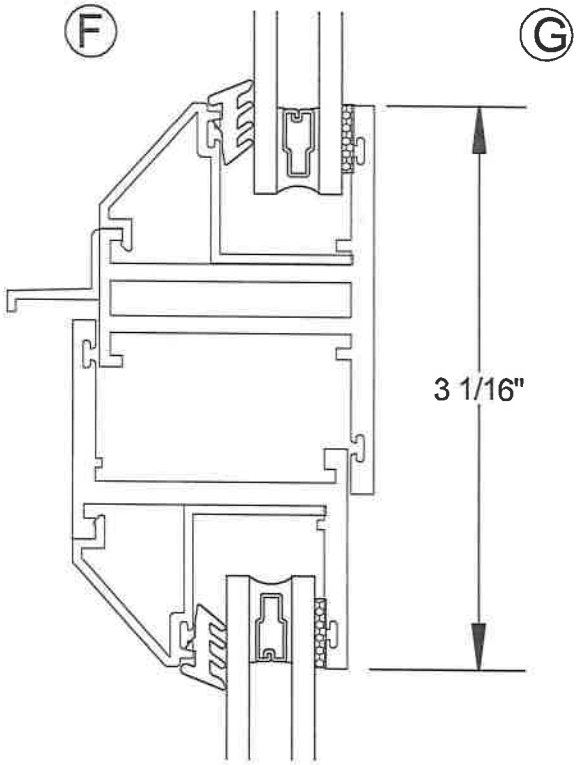
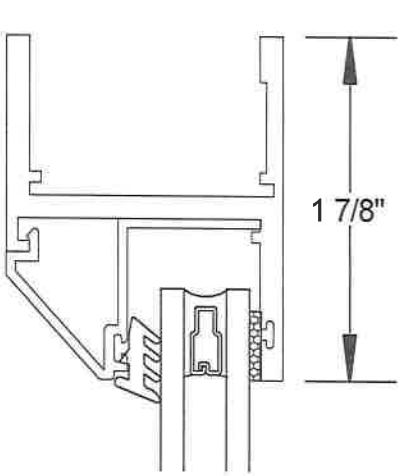
Rasmussen & Assoc.
Cathy Wilson

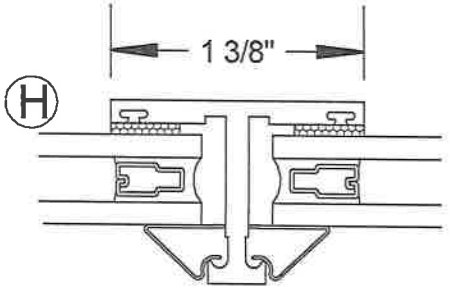
1500 SERIES EQUAL LEG FRAME
1/2" DUAL CLEAR GLASS WITH SLOPE STOPS.

1/11/13
PAGE 2 OF 2









METAL WINDOW CORPORATION

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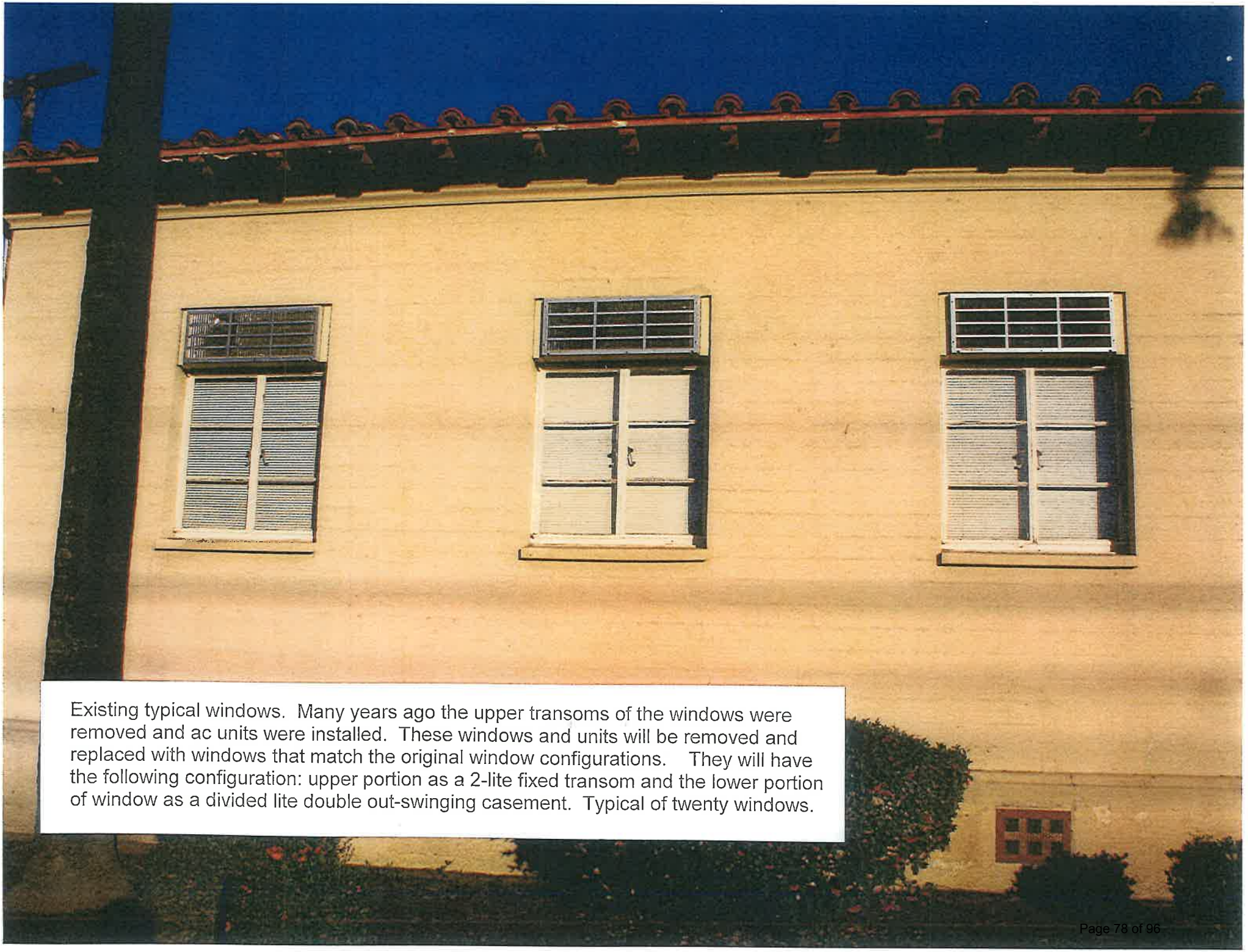
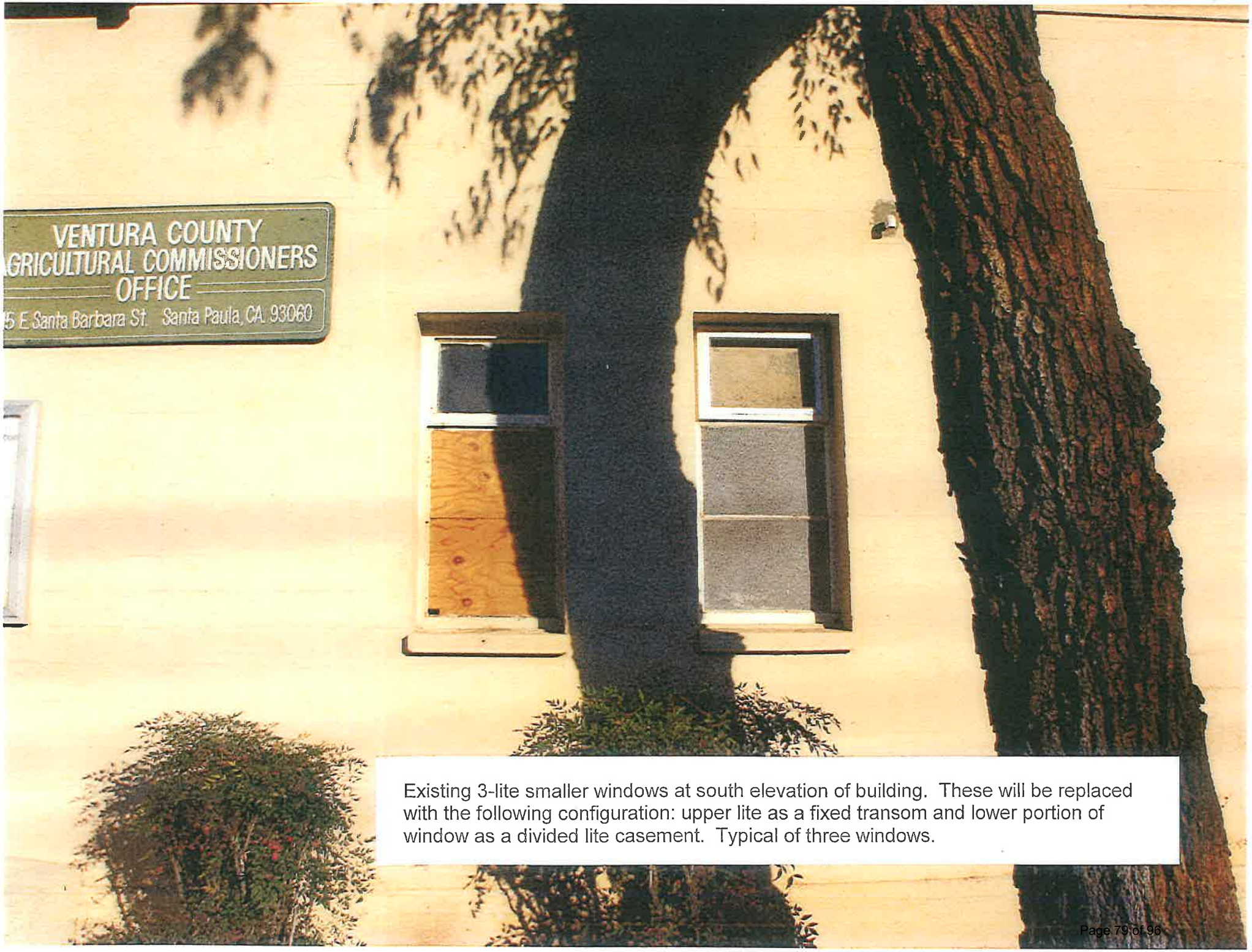
Existing window with original configuration intact. This will be replaced with the following configuration: upper portion as a 2-lite fixed transom and the lower portion of window as a divided lite double out-swinging casement. There are two existing windows that have this original configuration.

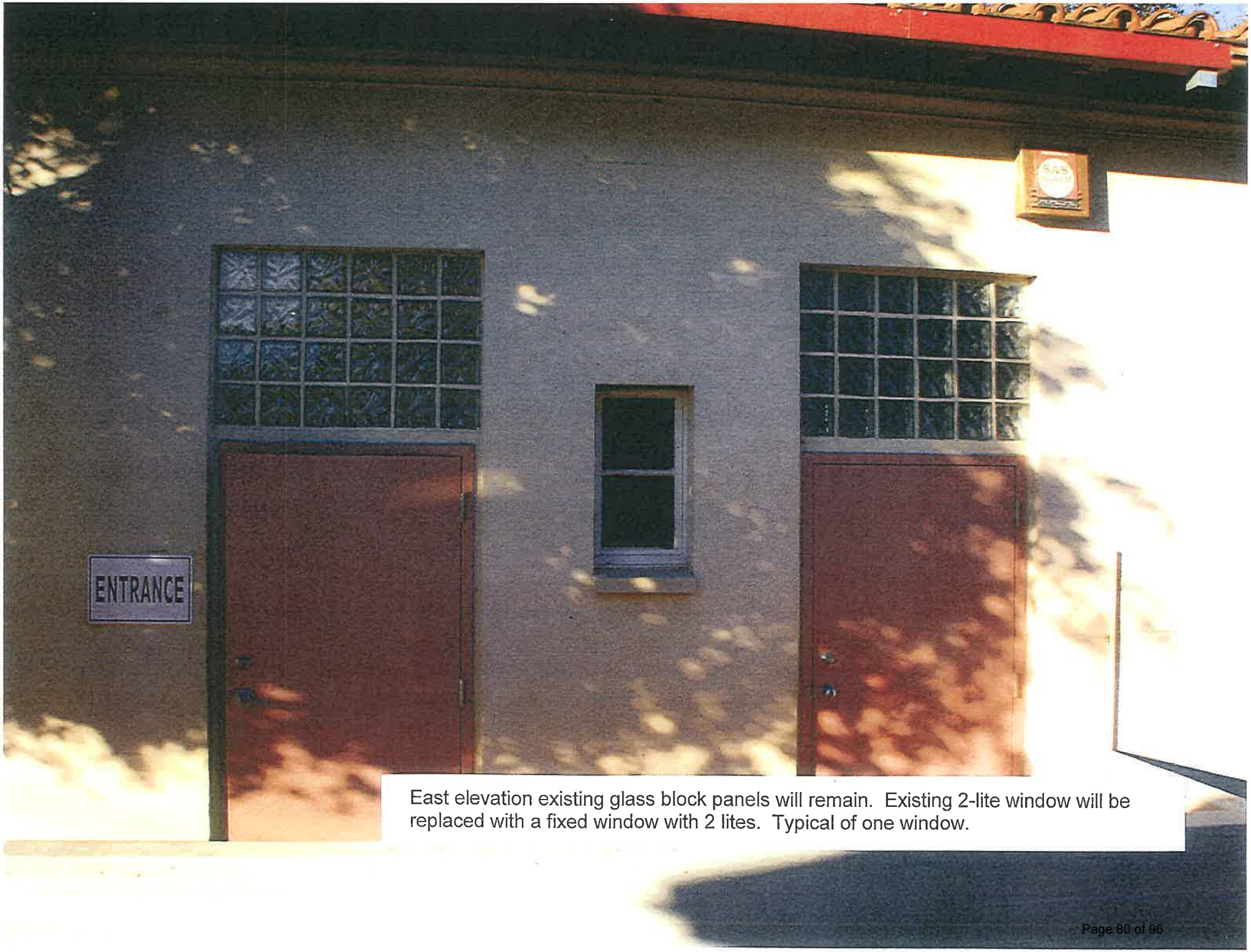
EXHIBIT 4



Existing typical windows. Many years ago the upper transoms of the windows were removed and ac units were installed. These windows and units will be removed and replaced with windows that match the original window configurations. They will have the following configuration: upper portion as a 2-lite fixed transom and the lower portion of window as a divided lite double out-swinging casement. Typical of twenty windows.



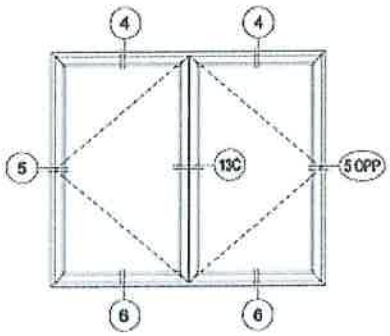
Existing 3-lite smaller windows at south elevation of building. These will be replaced with the following configuration: upper lite as a fixed transom and lower portion of window as a divided lite casement. Typical of three windows.



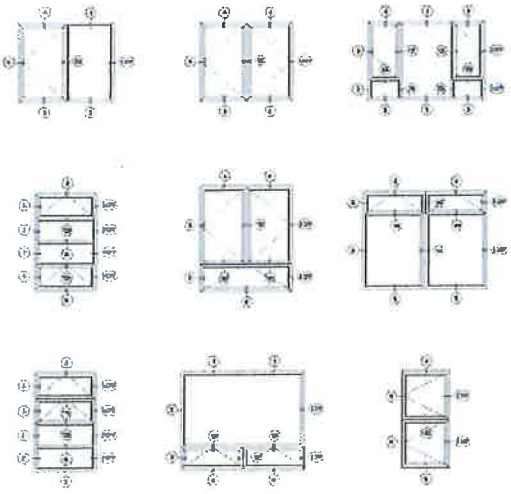
East elevation existing glass block panels will remain. Existing 2-lite window will be replaced with a fixed window with 2 lites. Typical of one window.

METAL WINDOW
CORPORATION

B CASEMENT / CASEMENT (CC)



TYPICAL ELEVATIONS: Roll over the images below to view large. Click on a selection to view/download details.



RESIDENTIAL 1500 SERIES WINDOWS

OVERVIEW/SPECS [click here]

Series 1500 Master CAD Files: DWG
[*ALL*] Series 1500 Window Elevations / Details

Typical Elevations: Select an elevation to view details.

Elevation A: PDF I DWG
Casement / Fixed (CO)

Elevation B: PDF I DWG
Casement / Casement (CC)

Elevation C: PDF I DWG
Special Combo Casement / Fixed + Ficed + Casement / Fixed (SPEC COMB C/O+O+C/O)

Elevation D: PDF I DWG
Stacked Awning / Fixed / Fixed / Awning (STK'D: A/O/O/A)

Elevation E: PDF I DWG
Stacked Double Casement Over Awning (STK'D: CC/A)

Elevation F: PDF I DWG
Stacked Double Awning Over Double Fixed (STK'D: AA/OO)

Elevation G: PDF I DWG
Stacked Awning / Awning / Fixed / Fixed (STK'D: A/A/O/O)

Elevation H: PDF I DWG
Stacked Fixed Over Double Awning (STK'D: 0/AA)

Elevation I: PDF I DWG
Stacked Casement Over Casement (STK'D: C/C)

Elevation J: PDF I DWG
Stacked Double Hopper Over Double Fixed (STK'D: HH/OO)

Overview I Back to Top

The MWC 1500 Series Windows are ideal for residential, commercial, school, hospital, mixed use and industrial projects using moderate sized fixed, projected or casement windows. All ventilators are fully weather-stripped. MWC butt hinges are welded to frames to assure strength and alleviate unsightly rivets and screws. All extrusions are 6063-T6 or T5. Windows are assembled without the use of screws or fasteners. Frames and ventilators corners are mitered, reinforced with 3/16" thick aluminum crimped and welded. All muntins are mortised and welded into the frame to form true divided lites (TDL). All windows have been tested and certified by a recognized testing laboratory to AAMA and NFRC standards.

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Screens are constructed of .020" nominal thickness frame stock, and screen mesh shall be 18X16 gauge charcoal fiberglass cloth, held in place by vinyl spline. Screens can be easily removed, requiring no special tools to do so.

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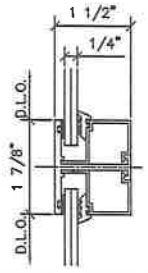
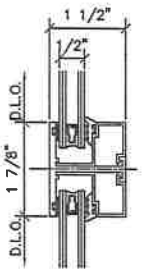
MUNTIN DETAILS



1 7/8" MUNTIN – SQUARE BEAD



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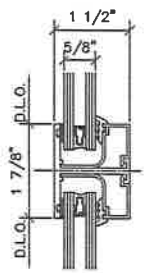
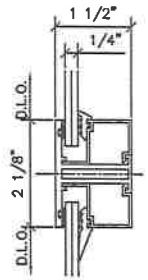
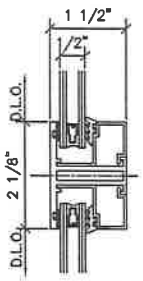


1 7/8" MUNTIN – SQUARE BEAD



2 1/8" MUNTIN – SQUARE BEAD



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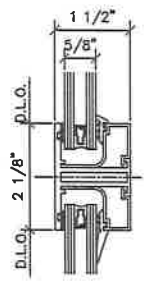
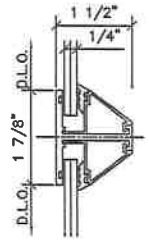
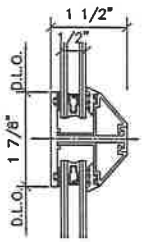


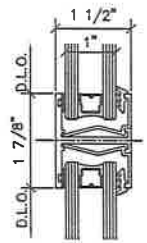
2 1/8" MUNTIN – SQUARE BEAD



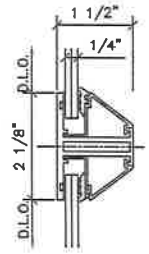
1 7/8" MUNTIN – BEVELED BEAD



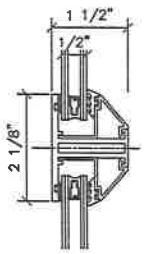
1 7/8" MUNTIN – BEVELED BEAD



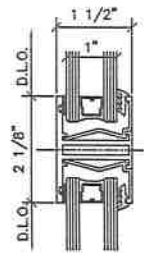
1 7/8" MUNTIN – SQUARE BEAD



2 1/8" MUNTIN – BEVELED BEAD



2 1/8" MUNTIN – BEVELED BEAD



2 1/8" MUNTIN – SQUARE BEAD

1 1/2" DEEP
TRUE DIVIDED LITE (MUNTIN) & GLAZING BEAD OPTIONS:
FOR USE WITH: 1500 SERIES, 3500 SERIES, & 4000 SERIES ONLY

SCALE: 1 : 1

Shows true divided lites

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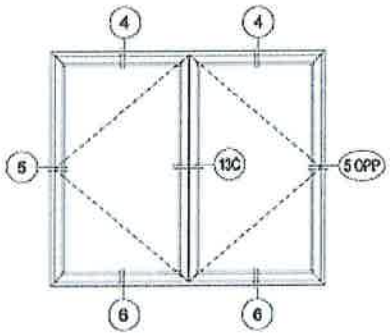
(B) CASEMENT / CASEMENT (CC)



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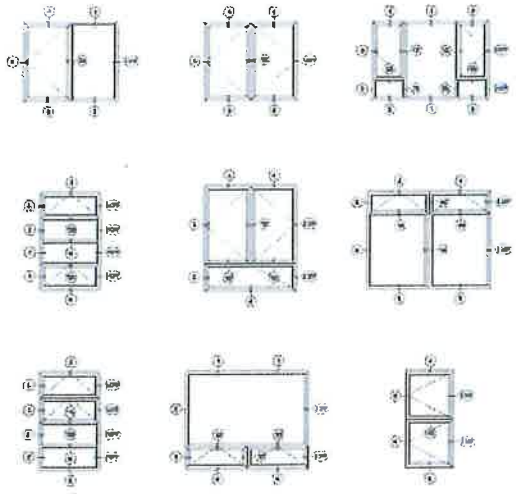

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Casement / Casement (CC)

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Elevation D: PDF I DWG
Stacked Awning / Fixed / Fixed / Awning (STK'D: A/O/O/A)

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Stacked Double Casement Over Awning (STK'D: CC/A)

Elevation F: PDF I DWG
Stacked Double Awning Over Double Fixed (STK'D: AA/OO)

Elevation G: PDF I DWG
Stacked Awning / Awning / Fixed / Fixed (STK'D: A/A/O/O)

Elevation H: PDF I DWG
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Elevation J: PDF I DWG
Stacked Double Hopper Over Double Fixed (STK'D: HH/OO)

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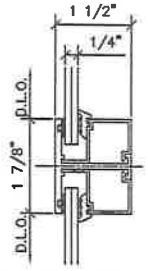
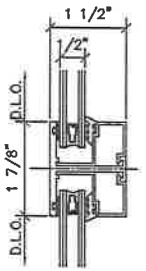
MUNTIN DETAILS



1 7/8" MUNTIN – SQUARE BEAD



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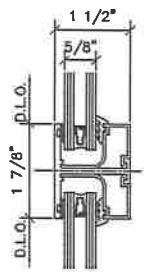

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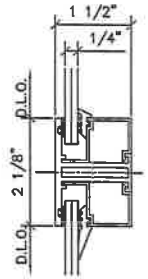
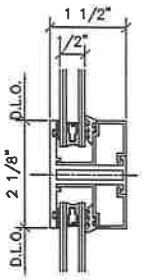
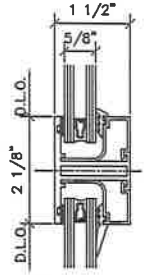


2 1/8" MUNTIN – SQUARE BEAD



2 1/8" MUNTIN – SQUARE BEAD



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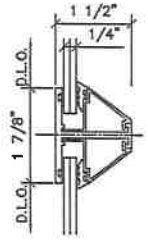
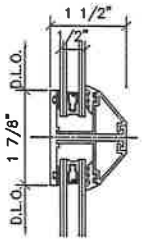


1 7/8" MUNTIN – BEVELED BEAD



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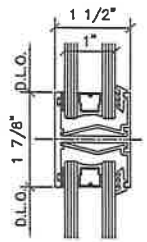

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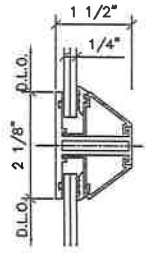

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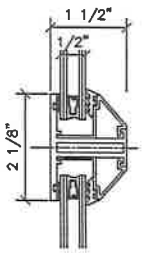

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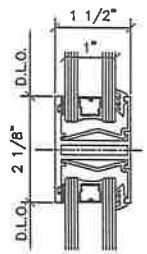

2 1/8" MUNTIN – SQUARE BEAD

1 1/2" DEEP
TRUE DIVIDED LITE (MUNTIN) & GLAZING BEAD OPTIONS:
FOR USE WITH: 1500 SERIES, 3500 SERIES, & 4000 SERIES ONLY

SCALE: 1 : 1

Shows true divided lites

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Tech Notes
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WINDOWS

NUMBER 19

Repairing Steel Casement Windows

Chad Randl
Technical Preservation Services
National Park Service

9 ROXBURY ROAD SCARSDALE, NEW YORK

Introduction

Durable, versatile and functional, steel casements were a popular window type throughout the first half of the twentieth century. They were simultaneously modern and traditional, easily adapted to fit the variety of eclectic architectural styles that appeared during the period. Benefiting from steel's strength, casements featured slender profiles that provided a lightness and delicacy unmatched by other window forms. They also admitted large amounts of sunlight and ventilation to the interior. Steel casements were widely distributed by a number of manufacturers including Fenestra, David S. Lupton & Sons, and Hope's of Jamestown (the latter of which is still in business), until the windows fell out of favor in the years after World War II. High quality steel, combined with the window's simplicity and solid construction, helped many survive three quarters of a century of use, wear, and often, neglect.

Casement windows are an important design element of the Tudor Revival house at 9 Roxbury Road. Built in the early 1920s, it is a common house type found within the neighborhood and among other suburban communities that date to this era. The sixty-five steel windows are placed individually, in pairs or in bands of three or four along the masonry and stucco exterior *(see figure 1)*. Each of the Fenestra brand windows contains six lights in two vertical rows with the panes putty-glazed on the outside. The historic glazing was double-strength glass with noticeable, though not prominent, distortions *(see figure 2)*. Hardware, consisting of a locking handle and sliding "lift and stay" operator with brass pin, was both functional and decorative, providing subtle embellishment along the inside of the window *(see figure 3)*.

Problem

The windows on 9 Roxbury Road showed deterioration and damage typical of historic steel casements. In the course of over seventy-five years, corrosion, wear and some distortion of the sash and frame had occurred. Rust was particularly prevalent along the lower parts of the sash and frame where water had penetrated the distorted opening and the cracked perimeter

Steel casement windows should be repaired rather than replaced whenever possible.

EXHIBIT 5

Figure 1. Steel casement windows were placed in various configurations throughout the house. Grouped windows open in opposite directions from each other, assuring that breezes can be captured, and a sash opened during rainy weather, regardless of the wind direction.

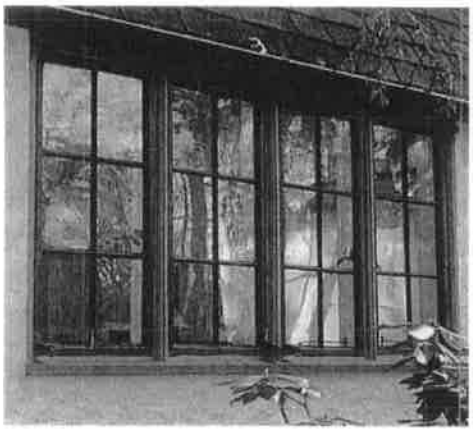


Figure 2. Each casement sash had six lights with projecting hinges that allowed the unit to open outward. Note the variation among glass panes as seen in the reflections. Caused by small differences in the positioning of panes within the sash and minor imperfections in the glass itself, this appearance is an important characteristic of historic windows.

caulk *(see figure 4)*. Originally tight fitting, all of the sash were bent out of alignment with resulting gaps from 1/16″ inch to 3/4″ inch between sash and frame. Hardware was corroded, stiff, and in some windows, seized shut. Prior attempts to force the distorted windows closed had also bent some of the locking handles and other hardware.

Ten windows were completely inoperable either because they were so far out of alignment that they could not be opened and closed or because successive layers of paint had sealed them shut. When a previous owner installed window-mounted air conditioners not designed for steel sash, four additional windows were modified and made inoperable.

Exterior glazing putty that helped secure and seal the glass in the window sash was deteriorated in many areas. Furthermore, some of the horizontal muntins along the room side of the sash were missing back putty that had cracked and fallen out. As expected with windows of this age, most sash showed signs of repeated patch attempts at reglazing and repainting. Resulting profiles lacked the crisp bevel that is characteristic of steel casement windows. Successive reglazing and repainting efforts had crept further out onto the glass (especially along the inside surface), increasing sightlines well beyond the 3/4″ width of the historic glazing bars.

Solution

The owner had purchased the house at 9 Roxbury Road, in part, because of its historic appearance. As an architect interested in older buildings, the owner recognized the importance of steel casement windows in helping to define the building's historic character (see "Steel Windows and Historic Character" sidebar).

When the windows deteriorated to the point where major repairs were required, the owner sought the least intrusive solution. Having seen other houses where casements had been replaced, it was clear that new aluminum, wood or vinyl units would not share the same dimensions, profiles and craftsmanship of the historic windows. While replacement with new steel casements was an alternative, saving most or all of the historic windows, if possible, was the preferred preservation solution.

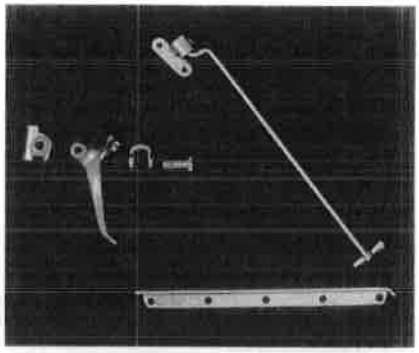


Figure 3. The window hardware at 9 Roxbury Road included a two-part "lift and stay" operator (right) and a common locking handle (disassembled at left). The hinged portion of the lift and stay (upper right) is attached to the sash while the perforated length is connected to the frame. To open the window, the pin is lifted from the hole on the far right, the sash is pushed open and the pin reset in one of the adjacent holes.

The owner contacted a window repair company that had over twenty years of experience repairing and servicing steel casement windows. After an initial inspection of the windows, a plan was drawn up for their complete rehabilitation. Much of the work would consist of realigning the bent sash and frame, thus returning them to their original tight fit. All the hardware would be serviced to make locks secure and to allow the hinges and other mechanisms to move without resistance. Additionally, broken parts were to be replaced with like materials from the repair company's stock. The

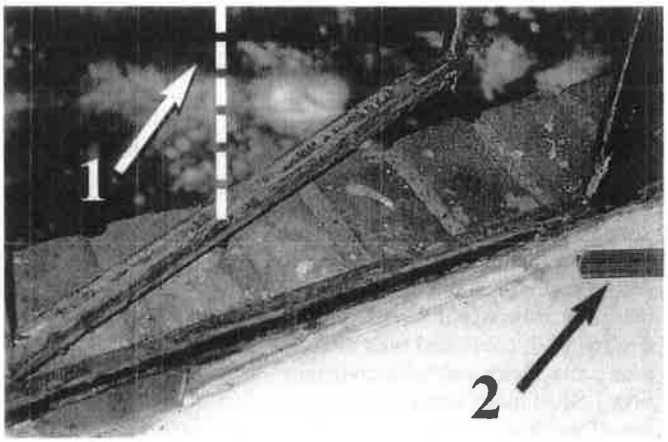
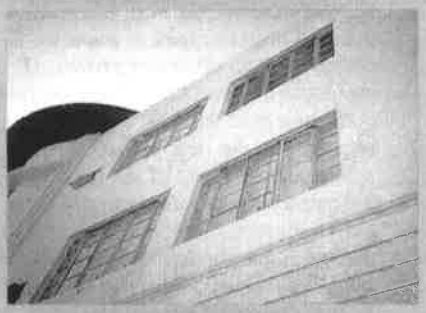
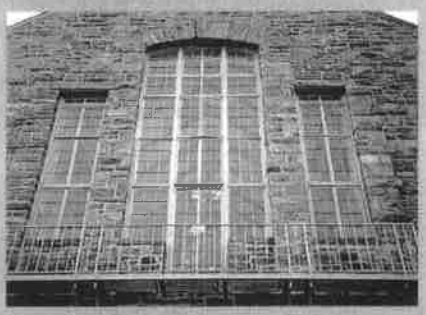


Figure 4. The sash and frame were most severely corroded along lower, horizontal members. A vertical glazing bar had previously been removed from the sash above to fit a window air conditioning unit (1). A replacement "T"- shaped length of steel that will be spliced in can be seen on the right (2).





Steel Windows and Historic Character

Whether Tudor Revival or International Style, Collegiate Gothic, Mission or Art Deco, steel casement windows had a place in many of the stylistic trends prominent in the years prior to World War II. Buildings based on medieval forms used steel casements to recreate traditional European windows. Modern architects, already partial to steel, found that ribbons of single-light casements matched their industrial aesthetic. The adaptability of steel casements also extended to a variety of building types and sizes, including small cottages and ostentatious mansions, schools, hospitals and apartment buildings. Frank Lloyd Wright's Fallingwater and the thirty-story Drake Tower in Philadelphia, though very different in scale and style, both featured steel casement windows as an important design element.

Regardless of a building's style or function, steel casement windows are often a crucial, "character-defining" feature. The muntin patterns of steel casements complement both the orientation of the window openings and the arrangement of windows in multiple groups or bands. Thin profiles form a pleasing contrast to the heavy masonry, brick or stucco walls in which they were often set. The aesthetic appeal and functional value of casements is enhanced when the units are opened, allowing maximum ventilation, and in those units with divided lights, emphasizing variations in the individual windowpanes.

Because casement windows figure prominently in a building's visual appearance and contribute to its historical character, any rehabilitation project should first attempt to repair the existing units. Unfortunately, replacement windows often do not match the historic windows. Replacements may be incompatible in material, dimensions, muntin arrangement or color. Any one of these changes can have a negative

Inappropriate replacement windows dramatically affect the appearance of a historic home that once featured steel casement windows.

effect, and may compromise the historic value of the entire structure. This *Preservation Tech Note* suggests methods that can be successfully used to repair steel casements. In rare cases where the historic units are beyond repair, replacement windows should match as closely as possible the design and appearance of the original casements.

Historic steel casement windows are in the process of being replaced with new units that compromise the character of this building facade.

window-mounted units were to be removed from the four affected windows and the damaged areas of the sash and frame rebuilt with lengths of steel that matched the existing profiles.

A separate painting company with extensive experience in painting historic steel windows would remove corrosion and repaint and reglaze the windows. As part of the planning, the paint contractor visited the site to evaluate the condition of the windows and discuss the work schedule. It was decided that after the windows were repaired and serviced, the company would strip existing paint and built-up rust, replace cracked or severely scratched glass panes, reputty as needed, and then repaint the windows.

Window Repair

Each window presented a different set of repair challenges depending on where it was located on the house, how often it was used, and whether it had previously been altered. All required some degree of realignment and servicing. Unless a sash was severely corroded or replacement steel sections required, glass was not removed from the sash for any part of the repair process.

A two-person team undertook repairs one room at a time, usually from the inside of the house. To protect interior spaces and furnishings from paint chips, dust, lubricating oil and primer, the crew taped plastic sheeting along the affected areas. When necessary, workers also

Figure 5. Before realigning the window, paint, caulk, weatherstripping and rust were stripped from all surfaces where the sash and frame were in contact.

accessed the windows from the outside, either on the ground or by a ladder scaffold. In this case, plastic sheeting was hung vertically in the interior. The work was undertaken during the day, while the homeowner was away. Before evening, work areas were cleaned up and protective sheeting was removed so that the process had little impact on the owner's household routine.

After protecting the work area, layers of paint, rust, caulk and weatherstripping were scraped from all contact surfaces where the sash meets the frame and where locking pieces meet *(see figure 5)*. Such extraneous material had to be removed before attempting to realign the window, so that the severity of distortion could be accurately determined and the repairman could tell when a correct fit was achieved. Using metal shims of varying thickness placed between sash and frame, the worker then began the realignment process by gently applying pressure to the sash. With the shims acting as levers, one location was pushed in while another was pulled, to bring racked corners and warped planes back into alignment. Where the sash was bent outward on either the top or bottom, it was gently twisted back into shape. On single windows, where there was little room to reach out and manipulate the sash from the inside, various pull bars custom-made of notched aluminum rods were used *(see figure 6)*. When the sash was aligned, bent locking pieces and other hardware were similarly returned to their original shape or, where broken, replaced with identical pieces.

The fit of sash against frame and the ease of movement in the hardware was tested throughout the process by opening and closing the window. Frequently gauging the progress prevented overadjustment. Care also had to be taken not to break hinges, handles or glass. The experienced repair team's understanding of the characteristics and tolerances of steel windows prevented such mishaps on this project.

When a close fit had been achieved and the window opened and closed freely, servicing began. Paint was scraped from hardware joints and contact points. Locking handles that did not function smoothly were disassembled, cleaned, adjusted and reinstalled. Loose handles were tightened. Dirt was removed from hinges and operators and then all working parts were lubricated. After repair and servicing were completed, areas of the window that had been stripped of paint were coated with an oil-based primer. This protected the bare metal from corrosion until the entire window could be repainted in the next phase.

Fortunately, most of the hardware at 9 Roxbury Road was generally in working order. Window repair projects that encounter broken hardware have several options. Minor damage, such as bent sliders or hinges, can often be repaired either in place or after removing the pieces to a workshop. If these working parts are damaged beyond repair (or missing), replacements can be obtained from dealers in salvaged,

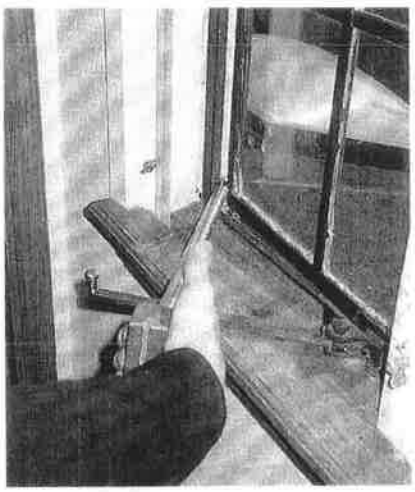


Figure 6. Pull bars were used to realign the sash from the inside. These custom made tools were especially useful on single sash units where the worker was unable to reach through an adjacent opening to apply pressure from the outside.

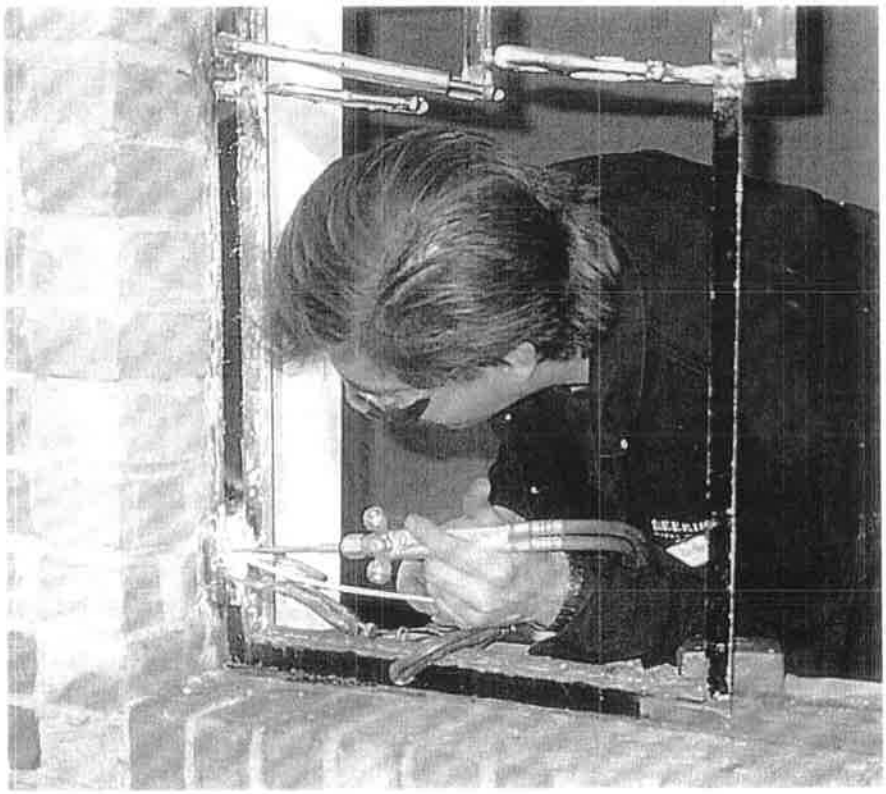


Figure 7. New steel sections were brazed into the historic sash and frame where the windows had previously been altered to fit air conditioning units. Because the replacement pieces came from a stock of salvaged window materials, they matched perfectly the profiles and dimensions of the missing sections.

Figure 8. A pneumatic needlegun was used to strip much of the paint from the steel frame and sash. It was followed by wire wheel and small disk sanders and hand chisels. The blunt tipped needles did not damage the steel or adjacent glass.

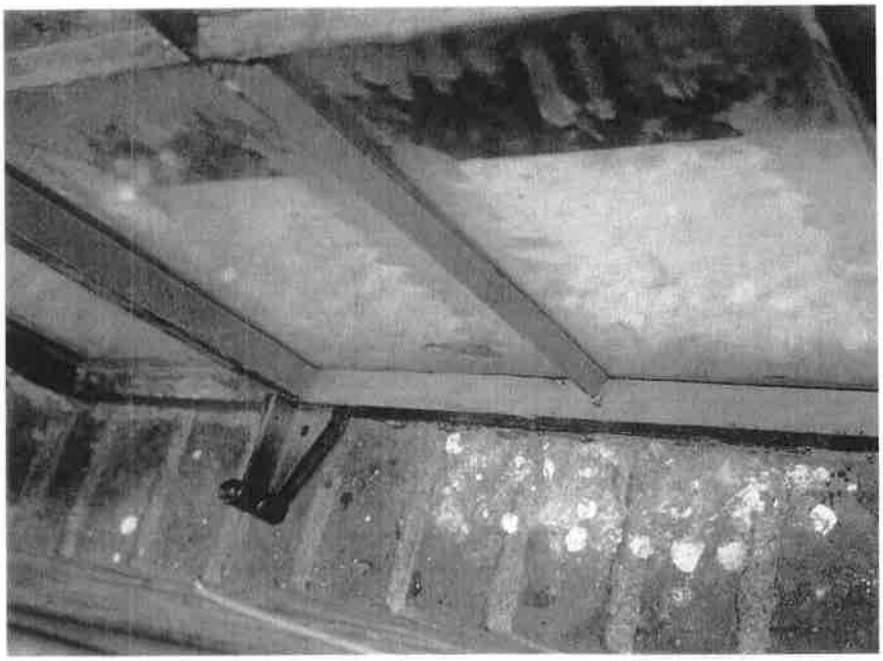


Figure 9. An oil-based putty was used to reglaze the historic casement windows. Painting was undertaken two weeks after reglazing.

or new, replicated hardware. See *http://www2.cr.nps.gov/tps/ptn45/material.htm* for a list of possible replacement material sources.

In order to repair the four windows previously altered for air conditioning at 9 Roxbury Road, it was necessary to replace missing metal sections along the lower third of the sash and frame. Lengths of replacement steel with the typical "Z" and "T"- shaped profiles were obtained from a stock of salvage material maintained by the repair company. Exact matches were easily achieved because replacement pieces came from identical Fenestra casement windows of the same period. To rebuild the sash, replacement steel bars were held to the existing sash with clamps and brazed together with an oxygen-acetylene torch *(see figure 7)*. After cooling, the brass seam was ground down with a sander so that it was flush with the existing surface. Though not necessary in this project, a similar treatment can be used when portions of the frame or sash are corroded beyond repair. In such a case, damage is usually limited to the frame, sill and lower portions of the sash, where unattended water problems lead to severe oxidization. The deteriorated section can usually be cut out and new pieces from salvaged stock brazed into place.

When the steel windows were properly aligned, the "Z"- shaped bars of the sash and frame fit together in a near weathertight configuration. As a result, weatherstripping was deemed unnecessary. In the past, however, as casement windows on the house had become misaligned and air and moisture infiltration increased, previous owners did add a variety of weatherstrips. Placed along the hinge side, the additional material acted as a shim, putting stress on the locking handle and hinges by holding the sash open on the locking side. A damaging cycle ensued as thicker weatherstrip was added in an attempt to close the widening gap, and the windows became increasingly distorted as the owner tried to force them shut. Eventually, problematic windows were simply never opened.

If weatherstrip is used on rehabilitated casement windows, care should be given to its placement in relation to the window's operation. The thinnest possible material that does not retain water or spring the hinges should be selected. One weatherstrip that has been used successfully with casements is a sealant bead. In this system, a silicone bead is applied to the frame and the sash contact surface covered with a non-stick tape. The sash is then closed and the bead allowed to set in the shape of the space between sash and frame. More information about weatherstripping and steel windows is contained in *Preservation Brief 13*. "The

Health Considerations

As with many old and new building materials, potential hazards exist in historic steel windows that require careful handling. Lead-based paint is likely among the built-up paint layers found on casements, while some glazing putty manufactured after 1930 for a time contained asbestos fibers. At a minimum, removing these materials requires the use of HEPA-filtered half-face respirators by workers, as well as covering the affected area with six mil polyethylene sheeting, and vacuuming dust and chips with a HEPA-filtered vacuum. The degree of protection required is determined by the manner in which potentially hazardous materials are removed; techniques that limit the spread of dust and do not make asbestos friable present fewer risks. Depending upon the type of work being done, the size of the project, and the jurisdiction of differing state laws and local ordinances, a certified contractor may be required to remove and dispose of these materials. *Preservation Brief 37*, "Appropriate Methods of Reducing Lead Paint Hazards in Historic Housing," as well as local environmental offices, the EPA and OSHA can provide additional information.

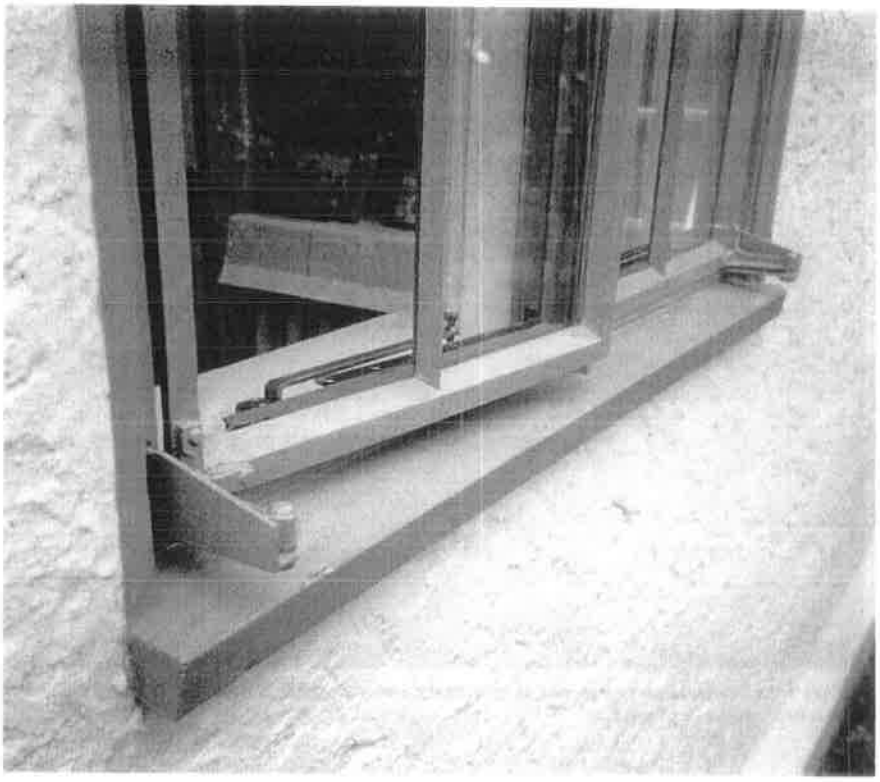


Figure 10. Detail of complete windows, repaired, serviced, reglazed and repainted.

Repair and Thermal Upgrading of Historic Steel Windows."

Stripping, Reglazing, Painting

Arriving after the windows have been completely repaired, adjusted and serviced, the paint contractor stripped old layers of paint from the windows, replaced deteriorated glazing putty and broken glass and reglazed and repainted each of the windows. Before any work was undertaken, plastic sheets were placed below the windows on the exterior and hung vertically along adjacent interior spaces. The sheets captured paint, rust chips and old putty so that they could be safely discarded *(see "Health Concerns" sidebar)*.

Deteriorated putty was removed with a utility knife and small chisel. Back putty that had crumbled or lost its adhesion was removed from the inside face of the sash using a small chisel and vacuum. Because individual panes were not removed unless previously broken, extreme care was required to clear old putty from the sash without damaging the historic glass. Removing the pane would have required prying it free of the remaining putty, a process that is extremely difficult to achieve without breakage. Having been protected by the glass and putty, the glazing bar beneath this area was usually in good condition; any minor rust patches were sanded by hand and then primed.

Initial paint and rust removal was done with a pneumatic needlegun. When set to a standard air pressure, the needlegun neither pitted the steel, nor damaged adjacent glass *(see figure 8)*. Occasionally an air hammer with a blunt end attachment was also used. The needlegun was followed by a sander with wire wheel attachments. Run the length of each steel member, this tool removed almost all of the remaining paint and most of the rust. It was especially useful in clearing pockets of rust from crevices and gently grinding down the more severely pitted surfaces. Removing rust with a sander was preferred over sandblasting because a sander is less messy, does not require shielding the glass and masonry surround, and is less likely to damage the steel. Finally, a small hand chisel and sandpaper were used in corners, on the inside edges of the hinges and in other tight locations not reachable with larger tools. Because they were used as guides for the application of the new putty bevel, it was essential that the edges of the muntins were free from nicks or bumps that would have resulted in an uneven profile.

After the sash and frame were stripped, a primer coat was immediately applied to the steel to prevent oxidization of the bare metal. The reglazing process then began. Approximately six percent of the historic glass panes were cracked or severely scratched prior to the beginning of the project. Damaged panes were replaced with standard double strength (1/8" thick) window glass. Alternately, the owner could have used a reproduction glass with a slightly distorted appearance that resembled the historic panes. However, the small number of new panes required meant that replacement flat glass would not be overly noticeable among the historic material.

The glazing contractor used natural, oil-based (linseed or soybean) putty that remains relatively soft. Putty was repacked along the interior face first. In keeping with the historic appearance of the windows, all putty lines on the inside were run flush with the muntin, so that no bevel profile was present. This brought sightlines back to the narrow appearance that is so characteristic of historic steel windows, while creating a watertight seal that keeps condensation from entering the joint. Putty was then applied along the exterior in a beveled profile that helps shed water *(see figure 9)*. Finally, the glass was carefully cleaned with a four-inch razor blade followed by a standard glass cleaner.

Although the manufacturer states that the putty can be painted the day after application, the painting contractor preferred to allow two weeks for the putty to cure sufficiently. Two finish coats were applied to the frame, sash and glazing putty. The industrial paint, a brand commonly used on steel bridges, was custom mixed a taupe color to match the exterior wood trim. To form a moisture resistant seal, paint was extended a small amount beyond the putty and onto the glass face – a standard practice, both past and present.

Evaluation

Steel casement windows that are in good working order tend to stay that way. If they function without resistance, excessive (and often damaging) force is not required to operate them. When windows are used and receive attention, eventual repair needs are more quickly identified, before they grow severe. While sound windows remain sound, steel windows that are in poor condition usually deteriorate at an accelerated rate. Problems often

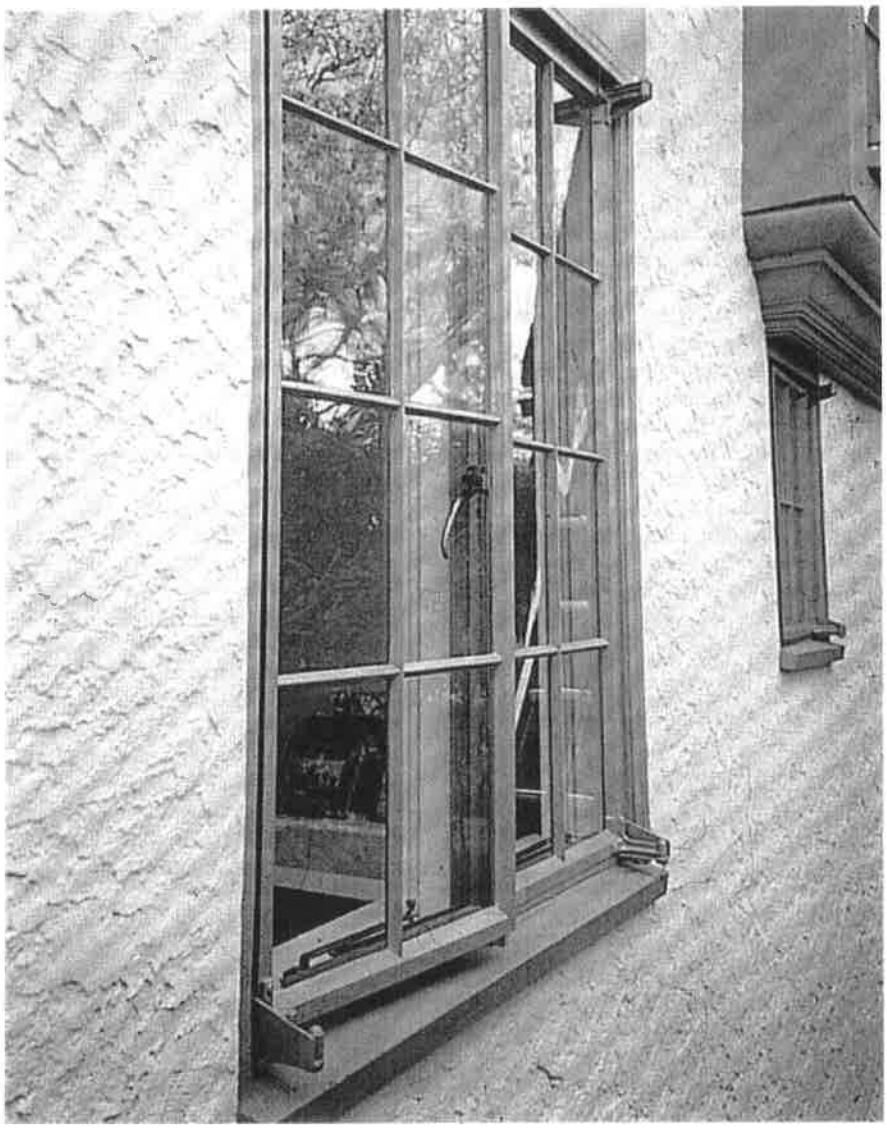


Figure 11. The completed work reveals the aesthetic appeal of the historic casement window – qualities appreciated both past and present.

begin with lack of maintenance. If the hinges or locking hardware become stiff and the window resists opening or closing, owners try to force the window, causing it to bend out of alignment. As alignment problems are aggravated, the window becomes harder to operate and the space between the sash and the frame widens, allowing unacceptable levels of air and moisture infiltration.

Repairing the historic steel casement windows at 9 Roxbury Street preserved a significant feature of the house, one that is important to the exterior appearance as well as the interior. With the removal of deteriorated paint and putty and a return to original narrow sightlines, the historic look of the windows was enhanced rather than diminished *(see figures 10 and 11)*. Window performance was increased through servicing and realignment, as the tight manufacturing tolerances between sash and frame were restored. The work was done in a timely manner, with no effect on surrounding historic material. Of equal importance, the sixty-five windows were repaired and reglazed for less than the cost of comparable steel or aluminum replacement windows.

Due to the high structural strength of steel, replacement sash of other materials (wood, aluminum, vinyl), rarely, if ever, can match the narrow members of the original sash. Additionally, installing replacement windows may require removal of the historic steel subframe and cause damage to plasterwork and exterior masonry. If replacement windows are set within the existing subframes, the glazed area of the window may need to be reduced by up to twenty percent, greatly altering the appearance of the opening and reducing the amount of light reaching the interior. Furthermore, modern glass that accompanies replacement units will not replicate the slight variation that exists between the original panes of a historic window.

Even when historic steel windows are not severely deteriorated, they are often targeted for replacement because of the desire to increase energy efficiency. Though good double glazed replacement windows will provide better thermal performance and lower energy costs than historic steel windows alone, any energy or cost saving calculation must include other factors not usually acknowledged. True replacement costs should include the expense and inconvenience of removing the historic units, the need to repair resulting damage to the window surrounds and the cost of the replacement units themselves. Such considerations are particularly relevant in light of the fact that homes are often owned for increasingly short time periods before being resold. Additionally, a shorter lifespan should be assumed for the replacement units, as the insulating glass units that accompany new windows will eventually fog and require costly replacement.

Assemblies have been developed that increase thermal efficiency while allowing the preservation of significant historic windows. The most common approach is to install storm windows. Because casements swing outward, the storms are almost always placed on the interior. Where casements are paired, inexpensive horizontally sliding storm windows can be installed on the inside. This arrangement allows full access to each sash so that they can be operated and maintained. Although full ventilation for which casements are prized is partially restricted, the level of airflow is still comparable to a typical double hung window. Storm windows can be extremely cost effective and can have little visual impact when they are installed properly and given an appropriate (typically dark color) finish. For a more detailed discussion of how storm windows can be applied to casements, consult *Preservation Tech Note,* "Windows Number 15. Interior Storms for Steel Casement Windows."

Another alternative to wholesale replacement of steel windows is the

use of laminated glass in place of the historic double-strength glass. Quarter-inch laminated glass, available through most glass suppliers, consists of a thin sheet of plastic film sandwiched between two sheets of standard glass, or a combination of standard and restoration glass. Reglazing casement windows with laminated glass provides improved thermal qualities and avoids the eventual fogging that occurs with insulating glass. The main drawback is, of course, the need to remove historic glass panes.

Conclusion

The historic steel windows at 9 Roxbury Street survived over seventy-five years of weather and wear. Their longevity attests to the strength of the material and the quality of their construction. Though significantly deteriorated, the owner chose to repair the historic windows rather than replace them. After realignment, reglazing, cleaning and repainting, the windows offer a continued lifespan that is hard for any replacement window to match. The benefits are doubly visible. On the outside, the house retains its historic look with appropriate windows with appropriate muntin divisions and profiles. On the inside, the narrow sightlines permit a large amount of light to enter the room, and the beauty of the window's craftsmanship is apparent.

Project Data:

Building:
9 Roxbury Road
Scarsdale, New York

Owner:
Chris Keeny

Project Date:
Fall 2001

Window Repair:
Seekircher Steel Window Repair
Scarsdale, New York

Window Stripping, Reglazing and Repainting:
Patriot Restorations
Scarsdale, New York

Project Cost:
The total cost for rehabilitating the sixty-five steel windows at 9 Roxbury Road came to approximately $23,500 total or $360 per window. This included approximately $4,000 for realigning and servicing, rebuilding missing sash sections, and replacing hardware. The remainder included stripping, reglazing and repainting all of the windows, as well as the necessary replacement glass.

Photos in "Steel Windows and Historic Character" sidebar are NPS file photos. All other photos are by the author.

THIS PRESERVATION TECH NOTE was prepared by the National Park Service. Charles E. Fisher, Technical Preservation Services, National Park Service, serves as the Technical Editor of the PRESERVATION TECH NOTES. Information on the window repair project at 9 Roxbury Road was generously provided by John Seekircher, Bob Seekircher and Paul Seekircher of Seekircher Steel Window Repair, and Chris Kelly and Joe Crylen of Patriot Restorations. Additional information was provided by Ralph Whitehead of R & D Painting. Special thanks are extended to Walter Sedovic of WSA Architects, John R. Volz of Volz and Associates, and Michael J. Auer, John Sandor, Kay D. Weeks and Sharon C. Park of the National Park Service's Technical Preservation Services for their review and comments.

PRESERVATION TECH NOTES are designed to provide practical information on traditional practices and innovative techniques for successfully maintaining and preserving cultural resources. All techniques and practices described herein conform to established National Park Service policies, procedures and standards. This Tech Note was prepared pursuant to the National Historic Preservation Act, which direct the Secretary of the Interior to develop and make available to government agencies and individuals information concerning professional methods and techniques for the preservation of historic properties.

Comments on the usefulness of this information are welcomed and should be addressed to PRESERVATION TECH NOTES, Technical Preservation Services – NC200, National Center for Cultural Resources, National Park Service, 1849 C Street, NW, Washington, DC 20240.

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