U. S. AIR FORCE

INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN

March Air Reserve Base

Volume I



January 2020



PHOTOGRAPH: Parade ground at March Field, 1934. Photograph courtesy of March Air Reserve Base and March Field Air Museum.

ABOUT THIS PLAN

This installation-specific Environmental Management Plan (EMP) is based on the United States (U.S.) Air Force's (USAF's) standardized Integrated Cultural Resources Management Plan (ICRMP) template. This Plan is not an exhaustive inventory of all cultural resource requirements and practices. External resources, including Air Force Instructions (AFIs); Air Force Manuals (AFMANs); USAF Playbooks; and federal, state, local, and permit requirements are referenced, where applicable.

Certain sections of this ICRMP begin with standardized, USAF-wide "common text" language that addresses USAF and Department of Defense (DoD) policy and federal requirements. This common text language is restricted from editing to ensure that it remains standard throughout all plans. The designated Air Force Civil Engineer Center (AFCEC) Office of Primary Responsibility (OPR) with assistance from the AFCEC Office of Collateral Responsibility maintains and updates common text language as appropriate.

Installation Supplement sections follow each of the USAF-wide common text sections. Installation Supplements sections contain installation-specific content to address state, local, and installation-specific requirements. Installation sections are unrestricted and are maintained and updated by AFCEC environmental Sections and/or installation personnel. Updates should be made only when there are unique requirements at an installation. They should not be used to reiterate standard USAF requirements, such as those found in AFIs or Department of Defense Instructions (DoDIs).

Table of Contents

DOCUMENT CONTROL	
Standardized ICRMP Template	
Installation ICRMP	
1.0 OVERVIEW AND SCOPE	
1.1 Executive Summary	
1.1.1 Summary of Major Points	
1.1.2 Cultural Resources Management Goals and Objectives	
1.1.3 Current and Priority CRIVI Requirements (5 Tear Flair)	
1.2.1 Mission Statement	
1.2.2 Historical Perspective	
1.2.3 Legal Requirements	
2.0 INSTALLATION PROFILE	12
3.0 ENVIRONMENTAL MANAGEMENT SYSTEM	18
4.0 GENERAL ROLES AND RESPONSIBILITIES	18
5.0 TRAINING	19
6.0 RECORDKEEPING AND REPORTING	20
7.0 STANDARD OPERATING PROCEDURES	21
7.1 Communication, Planning, and EIAP	
7.2 36 CFR Part 800 Process (Implementing NHPA Section 306108)	21
7.3 Cultural Resources Contracting	
7.4 Discoveries of Archaeological Resources and NAGPRA Cultural Items	
7.5 Native American Access	
7.6 Accidents and Emergencies Affecting Historic Properties	
7.7 Suspected Vandalism	
7.8 Curation of Conections and Records	
<u> </u>	
8.0 CULTURAL RESOURCES INVENTORY	
8.1 Physical Setting	
8.3 Resource Inventories	
8.4 Installation Areas of Concern	
8.5 Other Cultural Resources	
9.0 GOALS AND OBJECTIVES	70
10.0 PROGRAMMING AND PLANNING	72
10.1 USAF and Installation Actions	
10.2 Cultural Resources Project Programming and Execution	73
11.0 REFERENCES	74
11.1 Standard References	74
11.2 Installation References	75

INTEGRATED CULTURAL RESOURCES MANAGEMENT PLAN

12.0 ACRONYMS	78
12.1 Standard Acronyms (Applicable to all USAF Installations)	78
12.2 Installation Acronyms	
13.0 DEFINITIONS	79
13.1 Standard Definitions (Applicable to all USAF Installations)	79
13.2 Installation Definitions	
14.0 INSTALLATION-SPECIFIC CONTENT	79
APPENDIXES	80

DOCUMENT CONTROL

Standardized ICRMP Template

In accordance with (IAW) the AFCEC Environmental Directorate Business Rule 08, *EMP Review, Update, and Maintenance*, the standard content in this ICRMP template is reviewed periodically, updated as appropriate, and approved by the Cultural Resources Subject Matter Expert (SME).

This version of the template is current as of 09/24/2018 and supersedes the 2015 version.

NOTE: Installations are not required to update their ICRMP Updates every time this template is updated. When it is time for an ICRMP, installations should refer to the eDASH EMP Repository to ensure they have the most current template.

Installation ICRMP

Record of Review – The ICRMP is updated annually, or more frequently, as changes to cultural resource management and protection practices occur, including those driven by changes in applicable regulations. Annual ICRMP updates are critical for effective cultural resource management, as they ensure that new information on historic properties, historic property surveys and evaluations, and findings of eligibility are added to the ICRMP as they become available. The ICRMP will be revised and approved at least every five years, or when there is a significant change to the mission or installation, IAW AFI 32-7065, Cultural Resources Management, and DoDI 4715.16, Cultural Resources Management. The Base Civil Engineer (BCE) level, at a minimum, will sign the five year/significant updates. The installation Cultural Resources Manager (CRM) or an AFCEC Branch or Section Cultural Resource Specialist (CRS) will update the Plan every year. ICRMPs should consider the effects of installation missions on cultural resources, the maintenance and upkeep of those resources, and compliance with National Historic Preservation Act (NHPA) Sections 306108, 306101-107, and 306109-114, and new survey and evaluation data. The CRM, the CRS, or the Branch specialist will send the ICRMP, or a summary of updates since the last approval, to the Civil Engineer (CE) squadron commander or comparable officer/civilian for review IAW DoDI 4716.16 and AFI 32-7065. Annual reviews do not require BCE signature, but are captured in a memo to the BCE. Annual review procedures are outlined below:

ICRMP Annual Review and Coordination

Annual Requirements

- Update data tables (minimum will include: resources, evaluations, locations, and references), including the Installation Profile
- Update survey locations tables and maps. Always include surveyed acreage and survey boundaries, note the dates of the surveys, and cite the survey report on the map or in map legends
- Add new Memoranda of Agreements (MOAs), Programmatic Agreements (PAs), Native American Graves Protection and Repatriation Act (NAGPRA) Comprehensive Agreements (CAs) and Plans of Action, and other signed agreements or understandings that drive work requirements
- Summarize MOAs, PAs, NAGPRA CAs and Plans of Action, and other agreement or understanding documents in the Executive Summary and Work Plan
- Add outline of new planning data, to include mission changes, construction, destruction, development, etc., that will drive NHPA Section 306108 and/or Environmental Impact Analysis Process (EIAP) reviews and consultations

Timing

- Update period is at least annual
- ICRMP may (and should) be updated continuously through the year

Validation

- The AFCEC CRS writes an Annual Update Memo to the installation briefly outlining annual changes and additions
- Annual Update Memo included in the ICRMP
- Update is complete when the AFCEC CRS's Annual Update Memo is sent to the CRM for appropriate installation-level distribution. The annual review cycle is complete (and the ICRMP will show as "green" on all relevant eDASH dashboards) after the Memo is sent and all required metrics are updated in the Plans and Permits tool on eDASH

Digital File Storage and Archiving

- Current approved ICRMP PDF is kept on installation eDASH page
- Current approved ICRMP Word and Excel files are kept in the EMP Repository
- Installation will follow their installation's approved file management plan (e.g. Air Force Records Management System [AFRMS]) for archiving older ICRMPs IAW with current USAF policy

Annual ICRMP Review Date	Review Participants	Notes/Remarks	ICRMP Update Recommended? (Yes or No)

ICRMP Approval (Signature Page)

Base Commander
CE Commander
CRM

1.0 OVERVIEW AND SCOPE

This ICRMP was developed to provide for effective management and protection of cultural resources. It summarizes the history and prehistory of the installation and reviews past historical and archaeological survey efforts. It outlines and assigns responsibilities for the management of cultural resources, discusses related concerns, and provides standard operating procedures (SOPs) that will help to manage or preserve the cultural resources of the installation within the context of the mission. The ICRMP is intended for use by all personnel involved in installation planning. AFI 32-7065 acts as the main driver for the ICRMP. The Cultural Resources Management Playbook serves as supplemental guidance to this Plan.

1.1 Executive Summary

This report was prepared as an update for the 2011 *Integrated Cultural Resources Management Plan, March Air Reserve Base (March ARB), Riverside County, California*, IAW the revised guidelines put forth in AFI 32-7065. The ICRMP serves as a critical planning tool that integrates stewardship of cultural resources with the effective and efficient management of March ARB in support of the base mission. This report is divided into fourteen sections and identifies key cultural resources management issues affecting March ARB and instructs March ARB personnel in identifying and managing all cultural resources, defined as archaeological, architectural, and Native American resources, in conjunction with overall management of the base. In addition, this ICRMP delineates targeted compliance actions and SOPs that fulfill USAF requirements under applicable statutes and regulations pertaining to cultural resources.

Appendixes follow the main body of this report and include inventory tables, PAs, and other important information. Volume II of this ICRMP contains Department of Parks and Recreation (DPR) 523 Series forms documenting the results of a full architectural history survey completed as part of this ICRMP.

1.1.1 Summary of Major Points

March ARB currently occupies 2,385 acres in Riverside County, California. The current March ARB is a portion of the former March Air Force Base (AFB), which was selected for realignment as part of the Base Realignment and Closure (BRAC) program and became March ARB in 1996. Under this conversion, 4,400 acres of the former March AFB were transferred to March Joint Powers Authority (MJPA), including portions of the March Field Historic District (MFHD). The MFHD was listed in the National Register of Historic Places (NRHP) in 1994 and represents the only NRHP-listed historic property within the current boundaries of March ARB. The primary focus of the March ARB's cultural resources management program has been and will continue to be management and stewardship of the MFHD, which is located in the physical and operational center of March ARB. This management includes ongoing maintenance and repair of contributing resources and character-defining features of the historic district as well as effective integration of the historic district into the operational and mission-related activities of the base. In addition to responsibilities related to stewardship of the MFHD, the March ARB cultural resources management program seeks to identify, protect, and manage all significant cultural resources within the base and comply with all regulations and directives relating to cultural resources. The development of this ICRMP is an integral component of this management responsibility and serves as a targeted and codified management tool.

The entirety of March ARB has been surveyed for surface archaeological resources and no such resources have been identified. One archaeological isolate (consisting of a historic-period glass fragment) is known

Deputy Assistant Secretary of Defense for Infrastructure, Department of Defense Base Structure Report FY 2-18 Baseline, https://www.acq.osd.mil/eie/Downloads/BSI/Base%20Structure%20Report%20FY18.pdf, Accessed May 13, 2019.

to exist within the airfield. Furthermore, no known sacred sites or Traditional Cultural Properties (TCPs) are located within the current boundaries of March ARB.

1.1.2 Cultural Resources Management Goals and Objectives

The primary goals of the March ARB cultural resources management program over the next five years are as follows:

- Comply with NHPA Section 306108 (formerly Section 106) by identifying cultural resources eligible
 for listing in the NRHP and reducing or avoiding adverse effects to historic properties that could result
 from project activities
- Evaluate resources at March ARB as they reach 45 years of age in order to maintain compliance with NHPA Sections 306101-306114 (formerly Section 110)
- Identify, evaluate, nominate, and manage historic properties and maintain an up-to-date inventory of historic properties
- Facilitate and streamline interaction with federal, state, and local agencies and Native American tribes
- Continue the implementation of a cultural resources training program that highlights awareness of cultural resources and appropriate management procedures for installation staff, particularly project managers, maintenance personnel, and all tenant organizations
- Conduct an annual review of this ICRMP and perform a five-year update prior to 2025
- Ensure compliance with all applicable federal and state environmental legislation, regulations, and guidelines, including AFIs, the American Indian Religious Freedom Act (AIRFA), the Archaeological Resources Protection Act (ARPA), DoD guidance and policies, the NHPA, and the NAGPRA. See Section 11.0 for standard references

Refer to Section 9.0 for additional information on cultural resources management goals and objectives at March ARB.

1.1.3 Current and Priority CRM Requirements (5 Year Plan)

Project Title and Description	Estimated Completion Date	Status
2019 ICRMP	January 2020	In progress
Consultation support	Ongoing	Ongoing
2019 Section 306101-306114 updates	February 2020	Planned
2019 architectural history resource survey (refer to Volume II of this ICRMP)	September 2019	Complete

Refer to Section 10.2 for additional information on cultural resources project programming and execution.

1.2 General Information

1.2.1 Mission Statement

March ARB is home to the Air Force Reserve Command's (AFRC's) Fourth Air Force (4 AF), including the 452nd Air Mobility Wing (452 AMW). The primary mission of the 452 AMW is to provide airlift support for the USAF and to train in tactical airlift and airdrop of personnel and supplies in combat, air refueling, and aeromedical evacuation. The 452 AMW is the host organization responsible for all operational functions at March ARB and is the AFRC's largest wing. In addition to housing the 452 AMW,

March ARB is home to units from the Army Reserve, Marine Corps Reserve, and the Air National Guard (ANG). Other tenants at the base include the Department of Homeland Security and several defense contractors.

1.2.2 Historical Perspective

March ARB has been dedicated to aircraft training since it was first established as Alessandro Flying Training Field by the Army Air Service, prior to its designation as March Field on March 20, 1918. Aviation cadets received primary training at March Field during World War I. The federal government purchased land encompassing the base in May 1920, however, the flight training school there was shuttered the following year. Passage of legislation upgrading and expanding the military's aviation sector later led to the reopening of March Field as one of three Air Corps flight schools in the U.S. years later in 1927, and the facility was redesigned according to a formal, axial plan with a triangular form with new buildings expressed in the Mission Revival style. Tactical units were stationed at March Field in 1931, while construction of the permanent resources at the facility was still underway.

In 1933, March Field became the primary west coast base for gunnery and bombing training after Muroc bombing range, which is part of the present-day Edwards AFB, was established in the Mojave Desert for bombing practice. March Field provided training, staging, and aircraft testing functions during World War II, when it formed the largest aviation field on the west coast. In 1940, the War Department ordered the construction of an anti-aircraft artillery camp, Camp Haan, near March Field to accommodate trainees in the National Guard anti-aircraft program. Camp Haan later was combined with March Field, and the base was augmented through the addition of 920 acres to the north, east, and south in late 1940, doubling its size.

Construction at March Field expanded to meet an influx of enlistees during World War II. After the war, the facility was renamed March AFB when the USAF was created as an independent branch of the armed forces in 1947. The initial years following establishment of the USAF brought continuing command changes to March AFB, and on May 1, 1949, the base was assigned to the Strategic Air Command (SAC), a Major Command (MAJCOM) of the USAF. SAC control of March AFB led to a program of expansion at the base during the 1950s and 1960s, a period that also witnessed a surge in the population at the base. The SAC program ended with the close of the Cold War in 1992, and March AFB subsequently was transferred to the Air Mobility Command (AMC). The BRAC recommended March AFB for realignment in 1993, and the installation was realigned as March ARB in April 1996. Under this realignment, the base was decreased in dimension to approximately one-third of its peak size, with the surplus property transferred to the MJPA. The base continues to serve an air support mission, and is the AFRC's largest air mobility wing, with the 452 AMW Operations, Maintenance, Mission Support, and Medical groups.

A more in-depth ethnography and prehistoric and historic contexts are presented in Section 8.2.

1.2.3 Legal Requirements

Cultural resource management must be performed IAW federal laws and regulations and DoD and USAF policies and requirements. Specific legal requirements are identified in applicable sections of this Plan, the Cultural Resources Management Playbook, the eDASH Cultural Resources Home Page, the eDASH Air Force Legal Operations Agency (AFLOA) Legal and Other Requirements List, and in referenced documents.

Installation Supplement – Legal Requirements

March ARB complies with all applicable state and local requirements for the management and treatment of cultural resources. See Section 11.2 of this document for specific guidance.

2.0 INSTALLATION PROFILE

Scope of Plan	This plan applies to March ARB.	
OPR	The CRM, located in the Environmental Management Office, has overall responsibility for implementing the Cultural Resources Management Program and is the lead organization for monitoring compliance with applicable federal, state and local regulations.	
Cultural Resources Manager	Name: Chris Wagner Phone (office): (951) 655-3653 Email: christhild.wagner@us.af.mil	
State Historic Preservation Office (SHPO)	Name: Julianne Polanco, SHPO Address: Office of Historic Preservation (OHP) 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov	
	Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov	
Consulting Native American Tribe(s)	The BCE and CRM consult and coordinate with the following Native American points of contact, which includes 24 representatives from 11 federally recognized tribes and one non-federally recognized tribe (Agua Caliente Cupeño Tribe). The non-federally recognized tribe is not a consulting party, and instead is a stakeholder. The tribal contacts are listed below.	
	Name: Patricia Garcia-Plotkin, Director of Historic Preservation Agua Caliente Band of Cahuilla Indians Address: 5401 Dinah Shore Road, Palm Springs, CA 92264 Phone (main office): (760) 699-6907 Phone (direct): (760) 567-3761 Fax: (760) 699-6924 Email: acbi-thpo@aquacaliente.net	
	Name: Jeff Grubbe, Tribal Chairman Agua Caliente Band of Cahuilla Indians Address: 5401 Dinah Shore Road, Palm Springs, CA 92264 Phone: (760) 699-6920 Fax: (760) 699-6924 Email assistant Ms. Laura Aviles, laviles@aguacaliente.net	
	Name: William J. Pink, Tribal Chairman Agua Caliente Cupeño Tribe Address: 48310 Pechanga Road, Temecula, CA 92592 Phone: (909) 936-1216 Email: wjpink@hotmail.com	

Consulting Native American Tribe(s) (continued)

Name: Doug Welmas, Tribal Chairman

Cabazon Band of Mission Indians, California

Address: 84-245 Indio Sprints Parkway, Indio, CA 92203

Phone: (760) 342-2593

Name: Judy Stapp, Director of Cultural Affairs Cabazon Band of Mission Indians, California

Address: 84-245 Indio Sprints Parkway, Indio, CA 92203

Phone: (760) 342-2593

Name: Bobby Ray Esparza, Cultural Director

Cahuilla Band of Indians

Address: 52701 Highway 371, Anza, CA 92539

Phone: (951) 763-5549, ext. 109 Email: culturaldirector@cahuilla.net

Name: Daniel Salgado, Tribal Chairman

Cahuilla Band of Indians

Address: 52701 Highway 371, Anza, CA 92539

Phone: (951) 763-5549, ext. 109 Email: chairman@cahuilla.net

Name: Denisa Torres, Cultural Heritage Program

Morongo Band of Mission Indians

Address: 12700 Pumarra Road, Banning, CA 92220

Phone: (951) 849-4697

Email: dtorres@morongo-nsn.gov

Name: Robert Martin, Tribal Chairman Morongo Band of Mission Indians

Address: 12700 Pumarra Road, Banning, CA 92220

Phone: (951) 849-4697

Name: Travis Armstrong, Tribal Historic Preservation Officer

Morongo Band of Mission Indians

Address: 12700 Pumarra Road, Banning, CA 92220

Phone: (951) 755-5259

Email: thpo@morongo-nsn.gov

Name: Robert Smith, Tribal Chairman

Pala Band of Mission Indians

Environmental Office, Administration

Address: 35008 Pala Temecula Road, PMB50, Pala, CA 92059

Phone: (760) 891-3500

Name: Mark Macarro, Tribal Chairman

Pechanga Temecula Band of Luiseño Mission Indians

Address: PO Box 1477, Temecula, CA 92593

Phone (main office): (951) 770-6313 Phone (direct): (951) 770-6210

Email assistant Emily Preston, epreston@pechanga-nsn.gov

Consulting Native American Tribe(s) (continued)

Name: Molly Escobar, Cultural Resources Manager Pechanga Temecula Band of Luiseño Mission Indians

Address: PO Box 1477, Temecula, CA 92593

Phone: (951) 770-6313

Email: mescobar@pechanga-nsn.gov

Name: Tuba Ebru Ozdil, Cultural Analyst

Pechanga Temecula Band of Luiseño Mission Indians

Address: PO Box 1477, Temecula, CA 92593

Phone (main office): (951) 770-6313 Phone (direct): (951) 770-6302 Email: eozdil@pechanga-nsn.gov

Name: Joseph Hamilton, Chairman

Ramona Band of Cahuilla

Address: PO Box 391670, Anza, CA 92539

Phone: (951) 763-4105

Email: sreckker@ramona-nsn.gov

Name: John Gomez, Cultural Resources Manager

Ramona Band of Cahuilla

Address: PO Box 391670, Anza, CA 92539

Phone: (951) 763-4105

Email: jgomez@ramona-nsn.gov

Name: Lee Clauss, Director of Cultural Resources

San Manuel Band of Mission Indians

Address: 26569 Community Center Drive, Highland, CA 92346

Phone: (909) 864-8933

Name: Lynn Valbuena, Tribal Chairman San Manuel Band of Mission Indians

Address: 26569 Community Center Drive, Highland, CA 92346

Phone: (909) 864-8933

Name: Gabriella Rubalcava, Environmental Director/Tribal Council

Santa Rosa Band of Cahuilla Indians Address: PO Box 391820, Anza, CA 92539

Phone: (951) 659-2700

Email: grubalcava@santarosa-nsn.gov

Name: Steven Estrada, Chairperson Santa Rosa Band of Cahuilla Indians Address: PO Box 391820, Anza, CA 92539

Phone: (951) 659-2700

Email: sestrada@santarosa-nsn.gov

Name: Vanessa Minott, Tribal Administrator

Santa Rosa Band of Cahuilla Indians

Address: PO Box 391820, Anza, CA 92539

Phone: (951) 659-2700

Email: vminott@santarosa-nsn.gov

G 1.4 N	N	
Consulting Native American Tribe(s)	Name: Joseph Ontiveros, Tribal Historic Preservation Officer	
(continued)	Soboba Band of Luiseño Indians Address: PO Box 487, San Jacinto, CA 92581	
	Phone: (951) 663-5279	
	Email: jontiveros@soboba-nsn.gov	
	Linaii. Johuveros@soooda-iisii.gov	
	Name: Scott Cozart, Tribal Chairman	
	Soboba Band of Luiseño Indians	
	Address: PO Box 487, San Jacinto, CA 92581	
	Phone: (951) 654-2765	
	Email: scozart@soboba-nsn.gov	
	Name: Anthony Madrigal, Historic Preservation Officer	
	Twenty-Nine Palms Band of Mission Indians	
	Address: 46200 Harrison Place, Coachella, CA 92236	
	Phone: (760) 398-6767	
	Email: amadrigal@29palmsbomi-nsn.gov	
	Name: Darrell Mike, Tribal Chairman	
	Twenty-Nine Palms Band of Mission Indians	
	Address: 46200 Harrison Place, Coachella, CA 92236	
	Phone: (760) 863-5108	
	Email Tribal Executive Assistant Leanna Thomas,	
	lthomas@29palmsbomi-nsn.gov	
Routinely consulted parties	At the time of this ICRMP, the points of contact for Consulting Parties	
	are as follows:	
	W. H. W.E. I. E. C. D.	
	Name: John M. Fowler, Executive Director	
	ACHP Address: 401 F Street NW, Suite 308, Washington, D.C. 20001	
	Phone: (202) 517-0200	
	Email: jfowler@achp.gov	
	Name: Julianne Polanco, SHPO	
	Address: OHP	
	1775 22rd Street Suite 100 Segrements CA 05916	
	1725 23 rd Street, Suite 100, Sacramento, CA 95816	
	Phone: (916) 445-7000	
	Phone: (916) 445-7000	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This requires the CRM to identify appropriate parties who may have an	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This requires the CRM to identify appropriate parties who may have an interest in affected historic properties. The CRM maintains a list of	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This requires the CRM to identify appropriate parties who may have an interest in affected historic properties. The CRM maintains a list of such parties and will notify them of any undertaking that is under	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This requires the CRM to identify appropriate parties who may have an interest in affected historic properties. The CRM maintains a list of such parties and will notify them of any undertaking that is under consultation in the Section 306108 process. Such notification solicits	
	Phone: (916) 445-7000 Email: julianne.polanco@parks.ca.gov Name: Ed Carroll, USAF SHPO Contact Address: OHP 1725 23 rd Street, Suite 100, Sacramento, CA 95816 Phone: (916) 445-7049 Email: ed.carroll@parks.ca.gov In addition, 36 Code of Federal Regulations (CFR) Part 800 requires agency officials involve the public in the Section 306108 process. This requires the CRM to identify appropriate parties who may have an interest in affected historic properties. The CRM maintains a list of such parties and will notify them of any undertaking that is under	

	Name: Greg Kuster, Director of Operations March Field Air Museum
	Address: PO Box 6463, March ARB, CA 92518
	Phone: (951) 902-9936
	Email: greg@marchfield.org
Routinely consulted parties	
(continued)	Name: Richard Sandzimier, Director
(Community Development Department Moreno Valley Environmental and Historical Preservation Board
	Address: 14177 Frederick Street, Moreno Valley, CA 92552
	Phone: (951) 413-3214
	Email: richardsa@moval.org
	Name: Riverside Historical Society
	Address: PO Box 246, Riverside, CA 92502
	Email: riversidehistoricalsociety@gmail.com
	Name: Mary Kopaskie-Brown, City Planner
	City of Riverside Planning Division
	Cultural Heritage Board
	Address: 3900 Main Street, Riverside, CA 92522
	Phone: (951) 826-5371
	Name: Alice Bradley, President
	Moreno Valley Historical Society
	Address: PO Box 66, Moreno Valley, CA 92556
	Phone: (951) 924-4146
	Name: Gina Cavallo Collins, Executive Director
	Mission Inn Foundation
	Address: 3696 Main Street, Riverside, CA 92501
	Phone: (951) 781-8241
	Email: collins@missioninnmuseum.org
	Name: Dr. Danielle Kelly, Executive Director
	MJPA
	Address: 23555 Meyer Drive, Riverside, CA 92518 Email: kelly@marchjpa.com
Office of the County of D. County	
Office of the Secretary of Defense most current "Base Structure Report"	2,385
notion of the "total acres" managed by	
the Installation including	
Geographically Separated Units (GSUs)	
Installation surveyable acres (i.e.,	2,385
undisturbed, accessible acres)	
Total acres ever surveyed	2,385
Acres surveyed in FY2018	An architectural history survey was completed for all 2,385 acres of the base as part of the ICRMP. Refer to Volume II.
Cultural Resources outreach program	The March Field Air Museum collaborates with the base and serves as
(e.g., website, welcome package, or	a strong public outreach mechanism for the surrounding community.
brochures)?	
Total archaeology sites recorded	0 (an archaeological isolate, consisting of a glass fragment, exists within the airfield, but the resource has not been recorded; it remains
Total al chaeology sites recorded	within the arrierd, but the resource has not been recorded, it remains

	in place); Areas where archaeological resources have been identified are no longer part of the March ARB boundaries.
Archaeology sites recorded in FY2018	0
Cumulative number of archaeology sites recorded through FY2018	0; Areas where archaeological sites have been identified are no longer part of the March ARB boundaries. One archaeological isolate, consisting of a glass fragment, exists within the airfield, but the resource has not been recorded; it remains in place.
Number of eligible or listed sites	N/A (no archaeological sites are within base boundaries)
Number of non-eligible sites	N/A (no archaeological sites are within base boundaries)
Number of unevaluated sites	N/A (no archaeological sites are within base boundaries)
Number of archaeology sites evaluated in FY2018	N/A (no archaeological sites are within base boundaries)
Total number real property facilities as reported in Appendix A	197 (reference Appendix B, Built Resources Inventory Table)
Number of eligible or listed real property facilities as reported in Appendix A	1 NRHP-listed district (the MFHD, consisting of 69 contributing resources and 13 non-contributing resources within the boundaries of March ARB); 1 individually-eligible resource (Building 413, also a contributing resource to the MFHD). Refer to Volume II.
Number of non-eligible real property facilities as reported in Appendix A	106
Number of unevaluated real property facilities as reported in Appendix A	23
Number of real property facilities evaluated in FY2018 as reported in Appendix A	A total of 175 resources were surveyed at March ARB as part of the ICRMP. Of these, 127 are re-evaluated MFHD and Cold War-era resources, and 48 are unevaluated resources that are primarily Cold War-era resources that are less than 50 years of age. Volume II of this ICRMP contains DPR 523 Series Forms for the surveyed resources.
Have Historic Status Codes been updated in the Accountable Property System of Record in FY2018?	No
Number of archaeology sites mapped into GIS	0
Number of surveyed acres mapped into GIS	2,385
Are historic real property assets (buildings/structures) mapped into GIS?	Yes
Cumulative volume in cubic feet of archaeology collections	Archaeology records on file with the CRM; cumulative volume of collection will be addressed in future updates of this ICRMP.
Cumulative volume in linear feet of associated records	Associated records on file with the CRM; cumulative volume will be addressed in future updates of this ICRMP.
Cumulative volume of archaeology collections complying with 36 CFR Part 79	0
Volume of archaeology collections acquired in FY2018	0
Volume of associated recorded acquired in FY2018	0
Archaeological collections repositories	An archaeological collection repository has not been identified since no archaeological sites are known to exist within the current boundaries of the March ARB (an archaeological isolate, consisting

of a glass fragment, exists within the airfield, but the resource has not been recorded; it remains in place).

3.0 ENVIRONMENTAL MANAGEMENT SYSTEM

The USAF environmental program adheres to the Environmental Management System (EMS) framework and its "Plan, Do, Check, Act" cycle for ensuring mission success. Executive Order (EO) 13693, *Planning for Federal Sustainability in the Next Decade*; DoDI 4715.17, *Environmental Management Systems*; AFI 32-7001, *Environmental Management*; and International Organization for Standardization 14001 standard, *Environmental Management Systems* – *Requirements with Guidance for Use*, provide guidance on how environmental programs should be established, implemented, and maintained to operate under the EMS framework.

The Cultural Resources Management Program employs EMS-based processes to achieve compliance with all legal obligations and current policy drivers, effectively manages associated risks, and instills a culture of continual improvement. The ICRMP serves as an "administrative operational control" that defines compliance-related activities and processes.

4.0 GENERAL ROLES AND RESPONSIBILITIES

AFI 32-7065 and the Cultural Resources Management Playbook contain detailed roles and responsibilities for cultural resources management. Installation-specific cultural resources management roles and responsibilities are described throughout this Plan and in referenced documents.

Installation Supplement - General Roles and Responsibilities

March ARB is home to the 452 AMW as well as units from the Army Reserve, Navy Reserve, Marine Corps Reserve, ANG, and the Department of Homeland Security. The CRM must consult with all host and tenant units to ensure that all mission-related activities are in compliance with the cultural resources regulations and requirements detailed by this ICRMP. In addition, the CRM must ensure that any conflicts that arise between the cultural resources management program and execution of the base mission are resolved IAW the rules and regulations herein as stipulated by AFI 32-7065.

Generally speaking, mission-related activities that have the most potential to conflict with the cultural resources management program are those that require renovation, modification, demolition, or removal of a building or structure that is a contributing resource to the MFHD or new construction within the district. In addition, changes in mission requirements that necessitate abandoning a historic property or putting it into layaway or lease by a third party also has the potential to conflict with the cultural resources management program.

The major roles/organizations involved in supporting the cultural resources management program include:

- Wing/Installation Commander
- CRM
- Installation Tribal Liaison Officer (ITLO)
- AFCEC Branch and Section specialists
- AFCEC Cultural Resources SME
- Legal/Judge Advocate
- Unit Environmental Coordinators (UECs); see AFI 32-7001 for role description

- SHPO
- Tribal Historic Preservation Officers (THPO)
- Tribal government leaders
- Interested public parties/stakeholders

5.0 TRAINING

Cultural resources management training is crucial to ensure that installation personnel, contractors, and visitors are aware of their role in the program and the importance of their participation to its success. The eDASH Training Matrix, available from the eDASH Cultural Resources Home Page, identifies cultural resources-related training topics, target audiences, training frequency, etc. Appropriate personnel must complete required education, training, and certification necessary to perform their jobs. Training records are maintained IAW the Recordkeeping and Reporting section of this Plan.

Installation Supplement - Training

Training Plan

Category	Training Course	Installation Plan (Describe training frequency, attendees and delivery method)
Archaeological	Archaeological Resources Protection	New CRM undergoes training within one year of starting at base. Various providers offer training courses.
Buildings	Historic Facility Management	New CRM undergoes training within two years of starting at base; Facilities Management personnel receive training as needed. Various providers offer training courses.
Buildings	Historic Structure Reports	CRM and Facilities Management personnel receive training as needed. Various providers offer training courses.
General Cultural Resources	Introduction to Cultural Resources Management – Laws and Regulations	New CRM undergoes training within one year of starting at base. Various providers offer training courses.
General Cultural Resources	Advanced Section 306108/Agreement Documents	New CRM undergoes training within one year of starting at base; Environmental Program Managers undergo training as needed. Training available through the Advisory Council for Historic Preservation; more information at: http://achp.gov/106advanced.html
Tribal	American Indian (or Alaskan) Cultural Communication Course	New CRM undergoes training within two years of starting at base; Installation Commander and Environmental Manager undergo training as needed. Training available through the DoD Environment, Safety and Occupational Health Network and Information Exchange (DENIX); more information at: https://www.denix.osd.mil/na/training
Tribal	American Indian Cultural Awareness Course	New CRM undergoes training within two years of starting at base; Installation Commander and Environmental Manager undergo training as needed. Training available through DENIX; more information at: https://www.denix.osd.mil/na/training
Tribal	NAGPRA	New CRM undergoes training within one year of starting at base. Training available through the National Park Service (NPS); more information at: https://nps.gov/nagpra/TRAINING/INDEX.htm
National Environmental Policy Act (NEPA)/EIAP	Understanding and Preparing Preliminary EIAP Documents: USAF Specific	CRM, Environmental Manager, and staff undergo training as needed. Training available through The Shipley Group; more information at: https://www.shipletgroup.com/applying-the-eiapnepa-process-airforce-specific

Category	Training Course	Installation Plan
NEPA/EIAP	EIAP Course (Air Force Institute of Technology [AFIT])	(Describe training frequency, attendees and delivery method) New CRM undergoes training within one year of starting at base; EIAP Program Manager, CE Flight Chiefs, and others listed in the course description undergo training as needed. Training available through AFIT Civil Engineer School; more information at: https://www.afit.edu/CE/Course Desc.cfm?p=WENV%20450
NEPA/EIAP	Applying NEPA/EIAP Process: USAF Specific	New CRM undergoes training within one year of starting at base; Environmental Manager and staff undergo training as needed. Training available through The Shipley Group; more information at: https://www.shipletgroup.com/applying-the-eiapnepa-process-air- force-specific

6.0 RECORDKEEPING AND REPORTING

Recordkeeping

The installation maintains required records IAW AFMAN 33-364, *Management of Records*, and disposes of records IAW the AFRIMS Records Disposition Schedule. Numerous types of records must be maintained to support implementation of the Cultural Resources Management Program. Specific records are identified in applicable sections of this Plan, in the Cultural Resources Management Playbook, and in referenced documents.

Reporting

The CRM is responsible for responding to cultural resources-related data calls and reporting requirements. The CRM and supporting AFCEC Branch and Section specialists should refer to the Environmental Reporting Playbook for guidance on execution of data gathering, quality control/quality assurance, and report development.

Installation Supplement - Recordkeeping and Reporting

March ARB possesses a limited, yet valuable, records collection related to the MFHD. The base holds a Property Ledger that includes construction photographs and general specifications as well as ongoing maintenance records that document maintenance, repairs, additions, and alterations through the 1940s. The ledger is securely stored in Building 470 and is available by appointment for reference by personnel and researchers. The Environmental Management Office houses a number of pertinent records including historic and current maps of the installation in digital format and hard copy, copies of previous cultural resources studies, and a SHPO Consultation File that includes consultation related to cultural resources at March ARB. Lastly, the March Field Air Museum, located adjacent to March ARB on Van Buren Boulevard, houses a substantial photographic collection related to the general development of the base, including within the historic district. In addition, the museum houses miscellaneous ephemera related to the contextual development of the base that is on public display.

While there are no officially affiliated curation facilities that house records related to March ARB, a number of important archival collections related to the physical development of the base are securely housed offsite at various federal repositories. Records of the Office of the Quartermaster General provide valuable information related to the construction of March Field and are housed at the Washington National Records Center in Suitland, Maryland. In addition, Records of the Office of the Chief of Engineers and Records of the Army Air Forces are housed at the National Archives, both of which also supply important information related to the construction and early development of March Field. Additional information on the curation

of collections and records is presented in Section 7.8. At this date, March ARB has no additional requirements regarding curation.

7.0 STANDARD OPERATING PROCEDURES

This section contains SOPs for managing and protecting cultural resources. The CRM ensures that appropriate procedures are properly communicated and followed by necessary personnel.

7.1 Communication, Planning, and EIAP

Applicability Statement:

This SOP applies to all USAF installations.

Background/Overview:

The EIAP is the USAF procedure for performing environmental project review, in compliance with the requirements of NEPA. The lead federal agency is responsible for initiating the EIAP early in the planning stages of a proposed action. The EIAP process is documented on AF Form 813, *Request for Environmental Impact Analysis*. The CRM must be familiar with NEPA and the EIAP process. Notably, NEPA compliance for cultural resources is often accomplished through completion of Section 306108 of the NHPA compliance, which specifically encourages agencies to coordinate NEPA and NHPA compliance issues early in project planning process. Compliance under NEPA alone does not usually substitute for Section 306108 compliance.

Procedure:

The CRM should:

- Work in close coordination with the EIAP manager during all NEPA reviews
- Assist the EIAP manager to determine whether existing and planned formal agreements under NHPA or other cultural resources authorities may be associated with the NEPA planning effort
- Confirm that NHPA Section 306108 review is required and identify other considerable cultural resources laws
- Identify and consult with SHPO or THPO/local governments/other parties
- Plan for public participation, as necessary

7.2 36 CFR Part 800 Process (Implementing NHPA Section 306108)

Applicability Statement:

This SOP applies to all USAF installations

Background/Overview:

36 CFR Part 800 implements Section 306108 of the NHPA. It is a federal review process designed to ensure that historic properties are considered during the planning and execution of federal undertakings. Activities, programs, or projects that have the potential to involve or affect historic properties and could trigger a 36 CFR Part 800 review include, but are not limited to:

- New construction and alterations to existing facilities
- Demolition of a historic property
- Maintenance of a historic property

- Rehabilitation of historic properties
- Real property actions such as land transfers, out-leasing, etc.
- Proposed beddowns
- Environmental Restoration Program investigations and clean-up

The 36 CFR Part 800 review process should be initiated early in the planning stages of a project. When applicable, maintenance and disposal of historic properties should be completed IAW the existing base PAs (refer to Appendix E).

Procedure:

Project Proponents should:

- During initial project planning (e.g., completion of AF Form 813; AF Form 332, Base Civil Engineer Work Request; DD Form 1391, Military Construction Project Data; and, AF Information Management Tool (IMT) 103, Base Civil Engineering Work Clearance Request ["Dig Permit"]), provide adequate information necessary to determine whether historic properties are present and to assess impact of the proposed project on historic properties
- If a proposed project could involve preparation of an environmental assessment or environmental impact statement, contact the CRM as early as possible to ensure that any required public participation, analysis, and review can be planned to meet the requirements of both NEPA and NHPA Section 306108 in a timely and efficient manner
- Implement mitigation or management conditions stipulated by the CRM resulting from the Section 306108 consultation/coordination process

The CRM should:

- Assess if the proposed action is being completed IAW the existing PAs for maintenance activities and disposal of properties (refer to Appendix E), and proceed as directed in the PAs
- Determine whether the proposed action is an undertaking IAW 36 CFR Part 800. If the action is an undertaking, define the Area of Potential Effects and determine if any historic properties are present within the area. Assess impact of proposed project on historic properties. Results of this review could include:
 - No Historic Properties Affected: This determination is made when the project will have no
 foreseeable effects on historic properties. The installation should seek concurrence from the
 SHPO and other consulting parties (i.e., tribal stakeholders)
 - No Adverse Effect: This determination is made when there might be an effect, but the effect will not be harmful to those characteristics that qualify the property for inclusion in the NRHP. The installation must seek concurrence from the SHPO and other consulting parties that no adverse effect is likely
 - Adverse Effect: This determination is made when the effect of an undertaking could diminish
 the integrity of the characteristics that qualify the property for the NRHP. The installation
 will continue consultations with the SHPO and other interested parties whenever an "adverse
 effect" is likely, expected, or unavoidable
- Coordinate execution of 36 CFR Part 800 process to support desired project schedules. Refer to the Cultural Resources Management Playbook for detailed descriptions of the Section 306108 review process

7.3 Cultural Resources Contracting

Applicability Statement:

This SOP applies to all USAF installations.

Background/Overview:

USAF Planning, Programming, Budgeting, and Execution (PPBE) is the process of acquiring funding for activities. Contracting of cultural resources-related work follows standard USAF PPBE processes. The Environmental Quality PPBE Playbook and Activity Management Plan Playbooks contain detailed information on funding and contracting.

March ARB will ensure that all compliance activities requiring professional expertise meeting the *Secretary* of the *Interior's Professional Qualification Standards* will be appropriately contracted to retain properly qualified individuals and firms.

Procedure:

- The CRM proposes future projects and includes them in the ICRMP and in the Accountable Property System of Record (APSR)
- If the project is determined to be eligible and funds are available for the project, the CRM develops a detailed statement of work and moves forward with contracting options

Contracting Points of Contact

Types of Cultural Resources Actions	Contracting Plan	Points of Contact
Archaeological Resources	Consult with Brent S. Hefty,	Name: Brent S. Hefty, Cultural Resources
	Cultural Resources Program	Program Manager,
	Manager, AFRC	AFRC
		Phone: (478) 327-2479
		Email: brent.hefty@us.af.mil
Architectural History	Consult with Brent S. Hefty,	Name: Brent S. Hefty, Cultural Resources
Resources	Cultural Resources Program	Program Manager,
	Manager, AFRC	AFRC
		Phone: (478) 327-2479
		Email: brent.hefty@us.af.mil

7.4 Discoveries of Archaeological Resources and NAGPRA Cultural Items

Applicability Statement:

This SOP applies to all USAF installations that contain or potentially contain archaeological resources and/or NAGPRA cultural items.

Background/Overview:

Accidental or unanticipated discoveries of archaeological resources may occur on USAF controlled lands. When discoveries occur, the proper actions must be taken to minimize damage to these resources and to ensure that legal requirements are met. The relevant statute is ARPA and the regulation is 32 CFR Part 229, *Protection of Archaeological Resources*.

There is also an important legal subset of archaeological resources, which includes NAGPRA cultural items (i.e., Native American human remains, associated or unassociated burial artifacts, and objects of cultural patrimony). The relevant regulation is 43 CFR Part 10, *Native American Graves Protection and Repatriation Regulations*. See the Cultural Resources Management Playbook for detailed guidance on the requirements of NAGPRA and this regulation.

It is a federal offense, under the provisions of ARPA and 32 CFR Part 229, to excavate, remove, damage, or otherwise deface any archaeological resources located on federal lands, without authorization. The provisions of ARPA apply to archaeological material greater than 100 years in age, regardless of the NRHP status of the site where they are found. Any person wishing to excavate or remove archaeological resources from an USAF installation must apply for an ARPA permit. USAF-contracted work is exempted from the permitting provision of ARPA. In the event of a permit request, the CRM should notify the AFCEC Section CRS. Detailed information to assist in facilitating ARPA permitting is available in the Cultural Resources Management Playbook.

Procedure:

USAF or contractor personnel that make or become aware of a potential archaeological discovery on installation lands should:

- Immediately notify the CRM of the nature and location of the discovery
- Immediately cease potentially damaging activities and take efforts to ensure protection of resources until arrival of the CRM or designee

The CRM should:

- Notify Security Forces of the discovery
- Ensure that all archaeological items are left in place and that no further disturbance is permitted to occur
- Sufficiently identify the location of the discovery to provide efficient relocation, yet take efforts to minimize the types of signs that could attract personnel and place the discovery in danger
- Direct installation personnel and contractors to take efforts to resume mission-associated activities in a reasonable and timely manner

Security Forces should:

- Notify the Wing Commander regarding the location, nature, and circumstances of the discovery
- Provide security/protection for the site to prevent unauthorized disturbance, looting, or vandalism

If human remains are discovered or if there is sufficient reason to suspect that human remains are present (such as the observation of an oval-shaped rock or earthen mound), the CRM should:

- Determine (with the aid of a coroner or forensic anthropologist) if the remains are human, and whether or not they are associated with an archaeological deposit
- If the remains are not human, and not associated with an archaeological deposit, work may continue
- If the remains are human, Security Forces should notify local law enforcement agency and a coroner, who will determine if the remains are recent, or ancient (with the aid of a forensic anthropologist). If the human remains are modern, the matter may become the responsibility of law enforcement officials who will determine when project activities may resume

Invite consultation with Native American tribes, as appropriate. If a qualified professional finds
the human remains to be Native American, the provisions of NAGPRA apply. Follow the
procedures outlined in 43 CFR Part 10 or in existing installation NAGPRA agreements with
tribes

7.5 Native American Access

Applicability Statement:

This SOP applies to USAF installations that receive requests from Native American Tribes or tribal members for access to USAF property for various reasons.

Background/Overview:

Members of federally recognized tribes have the right to access sites of traditional, cultural, or religious importance on lands under USAF control and to practice traditional religious activities associated with these sites. Tribal members may also request permission to collect small amounts of minerals or plant or animal materials for traditional, cultural, or religious purposes. Installations should routinely grant such permission, within the constraints of operational and/or safety concerns.

Procedure:

NOTE: Specific access procedures are developed through coordination with affected Native American Tribes should a tribe/group request visitation. Below is an example procedure for consideration when developing an installation-specific procedure:

The Wing Commander or Designee should:

- Perform initial contact required to establish government-to-government relationships with tribes and consult with tribal leaders
- Establish procedures for day-to-day working relationships with appropriate tribal representatives
- Establish government-to-government relationships with federally recognized affiliated tribes
- Document all government-to-government contacts, identification of specific tribal requirements and point of contacts for future consultation and coordination activities

The ITLO, with assistance from the CRM and other installation personnel as appropriate, should:

- Identify appropriate tribes with whom to establish ongoing relations for involvement in any subsequent planning processes. Document appropriate tribes, affected lands and specific access procedures in the 'Native American Tribes with Ancestral Ties to Installation Lands' table below
- Facilitate and maintain government-to-government relationships
- Compile and maintain a list of tribal point of contacts for consultation and coordination
- Brief incoming commanders on their responsibilities and arrange meetings, as appropriate
- Conduct routine consultation and coordination with affiliated tribes per the requirements identified during the government-to-government contact
- Maintain documentation of consultation and coordination and other contracts

Native American Tribes with Ancestral Ties to Installation Lands

Native American Tribe	Affected Lands	Access Procedures and
A C-lianta Dan I of C-locilla Indiana	Entine in stallation and all CCII-	Agreements
Agua Caliente Band of Cahuilla Indians	Entire installation and all GSUs	Entry Access List procedures
Agua Caliente Cupeño Tribe	Entire installation and all GSUs	Entry Access List procedures
Cabazon Band of Mission Indians, California	Entire installation and all GSUs	Entry Access List procedures
Cahuilla Band of Indians	Entire installation and all GSUs	Entry Access List procedures
Morongo Band of Mission Indians	Entire installation and all GSUs	Entry Access List procedures
Pala Band of Mission Indians	Entire installation and all GSUs	Entry Access List procedures
Pechanga Temecula Band of Luiseño	Entire installation and all GSUs	Entry Access List procedures
Mission Indians		,
Ramona Band of Cahuilla	Entire installation and all GSUs	Entry Access List procedures
San Manuel Band of Mission Indians	Entire installation and all GSUs	Entry Access List procedures
Santa Rosa Band of Cahuilla Indians	Entire installation and all GSUs	Entry Access List procedures
Soboba Band of Luiseño Indians	Entire installation and all GSUs	Entry Access List procedures
Twenty-Nine Palms Band of Mission Indians	Entire installation and all GSUs	Entry Access List procedures

7.6 Accidents and Emergencies Affecting Historic Properties

Applicability Statement:

This SOP applies to all USAF installations.

Background/Overview:

Federal laws and regulations provide exceptions to the standard NHPA Sections 306108, 306101-107, and 306109-114 reviews that may be used in times of emergency. Immediate rescue and salvage operations conducted to preserve life or property are exempt from the provisions of Sections 306108, 306101-107, and 306109-114 and the procedures outlined in 36 CFR Part 800.12. Per 36 CFR Part 78, the Secretary of the Air Force may waive all or part of the USAF's Section 306108 responsibility on a specific undertaking if the Secretary determines the existence of an imminent major natural disaster or a threat to national security. Such waivers will not exceed the period of the emergency, and generally do not extend to reconstruction or other activities beyond those immediately required to prevent endangerment of human life or property.

Procedure:

The following actions may be performed when responding to an accident or emergency situation (e.g., hazardous material spill, aircraft or vehicular accidents, fires/explosions, and natural disasters) where cultural resources may be affected:

USAF Personnel, Construction Crews, Utility Workers, Contractors, and Rescue Workers should:

- Notify the CRM as soon as possible upon realizing potential for impact to cultural resources associated with an emergency situation
- Take reasonable steps to avoid or minimize disturbance of significant cultural resources during emergency operations, as appropriate to concerns for human life or property

The CRM should:

- Complete a preliminary damage assessment of historic properties and identify cultural resources that might be affected by emergency response and provide guidance and advice to emergency operations workers on methods to avoid or minimize negative effects to cultural resources
- Photograph any damage before any changes are made to affected resources and collect appropriate historic information and recent photographs of affected resources
- Notify the Installation Commander and AFCEC of the emergency or disaster as soon as possible and include descriptions of historic properties potentially affected
- Notify the SHPO/THPO of any adverse effects to historic properties that resulted from the emergency and emergency response ss soon as practicable and within 14 days of the conclusion of the emergency situation
- Consult with the SHPO/THPO about steps necessary to reduce or mitigate adverse effects to historic properties when additional actions are necessary to stabilize, repair, or demolish historic properties damaged in the emergency or emergency response (e.g., demolition of historic properties that cannot be repaired or have become unsafe). Identify measures in concert with Installation Commander and AFCEC that can be completed using careful utilization of photos, plans, and the Maintenance Manual, as applicable (see Appendix K)
- If a waiver is requested, provide information to installation personnel regarding the status of the waiver request (granted or denied) and direction regarding follow-up notification of parties
 - If a waiver is granted, provide information regarding the scope and limitations of the waiver to appropriate installation personnel and initiate required notifications to SHPO
 - o If a waiver is not granted, provide direction to installation personnel regarding resumption of work and implement the Section 306108 consultation process

7.7 Suspected Vandalism

Applicability Statement:

This SOP applies to all USAF installations.

Background/Overview:

The installation has established procedures to deter vandalism and to investigate suspected acts of vandalism when a cultural resource protected under NHPA, ARPA, or NAGPRA is damaged as a result of unauthorized activity.

Procedure:

In the event of a discovery of damaged archaeological site or other historic property, the following actions should be performed:

Discoverer of potential looting or vandalism should:

- o Immediately notify the CRM (at 951-655-3653) and Security Forces (at 951-655-2981)
- Take all necessary precautions to protect the resource from further damage, loss, or destruction
- Wait for further instructions from the CRM or other authority

Security Forces should:

- o Notify the Installation Commander immediately regarding the location, nature, and circumstances of the looting or vandalism
- o Provide security/protection to prevent further unauthorized disturbance, looting, or vandalism

The CRM should:

- o Inspect the site to assess damage
- Notify the Installation Commander of damage within 48 hours of discovery. Include the
 following information in the damage report: circumstances of site damage, assessment of the
 nature and extent of damage, recommendations for treatment procedures (coordinate with
 SHPO and tribal authorities, as appropriate), and suggestions for future protection measures
- Notify Native American organizations and individuals if traditional cultural resources or sacred sites were damaged

Legal Department personnel should:

- Assess whether or not accused violators can be prosecuted
 - o Determine whether a civil penalty or other prosecution can be applied

7.8 Curation of Collections and Records

Applicability Statement:

This SOP applies to USAF installations that maintain archaeological collections that require curation. This installation does not maintain such a collection and is not required to implement this SOP. Any unforeseen curation needs, including archaeological curation, will be addressed as needed in subsequent updates of this ICRMP.

Background/Overview:

Federal regulations require curation of archaeological collections and their associated records owned by federal agencies in perpetuity (36 CFR Part 79, *Curation of Federally Owned and Administered Archeological Collections*). Curation of artifacts collected from USAF property shall be consistent with procedures in the *Guidelines for the Field Collection of Archaeological Materials and Standard Operating Procedures for Curating Department of Defense Archaeological Collections* (1999, Legacy Project No. 98-1714). Specific recommendations and procedures for curation are described in this ICRMP, where applicable, and in the Cultural Resources Management Playbook. Records related to historic properties or historic preservation should be evaluated for their usefulness in documenting the history of the installation's cultural resources and should be maintained or disposed of as appropriate.

Procedure:

The CRM should:

- Ensure that installation personnel are aware of the historic value of old records, collections, etc.
- Identify federally owned and administered archaeological collections and associated records required to be curated
- Identify an appropriate curation facility (or facilities). Location(s) where archaeological collections and their associated records are currently maintained include:

- o March ARB does not currently have a curation agreement; therefore, a curation facility has not been identified
- Prepare collections for moving to the identified curation facility
- Make a duplicate copy of all documentation on either acid-free paper or in digital format and store in a separate, secure, fire-safe location
- Transfer collections to the appropriate facility
- Conduct an annual inventory and inspect curated collections for compliance with applicable requirements
- Maintain records/documents regarding transferred collections

7.9 Management and Coordination

Applicability Statement:

This SOP applies to all USAF installations.

Background/Overview:

The following procedure outlines and describes cultural resources-related communication, review, and coordination processes and workflows.

Procedure:

Internal Reviews

Internal review procedures will be initiated as early in project planning as possible, so that personnel are allowed sufficient time to implement appropriate cultural resource activities, as required. Specific documents and processes that typically require internal review include:

- Completion of AF Form 332 for proposed work to Civil Engineering to determine whether the proposed work will affect any natural or cultural resources (a copy the form is included in Volume II of this ICRMP)
- Completion of AF IMT 103 generally for work involving digging to the CE to determine whether the proposed work will affect any natural or cultural resources
- NEPA project review including the EIAP and completion of AF Form 813

Notification and Consultation

- Consultation can occur at any time with Native American tribal groups or other stakeholders at the discretion of the CRM and the ITLO
- Notification and consultation with tribal groups must occur immediately if any human remains are encountered

Stakeholder Reviews

- Installation stakeholders can include, but are not limited to: the SHPO, the THPO, local surrounding communities, and the NPS
- The Public Affairs Office manages the official website for the installation and uploads cleared, sanctioned information for public access
- The CRM and ITLO are responsible for contacting NPS, SHPO, and any tribal groups for any reviews of cultural resource documents

Agreement Documents

- Agreement documents, such as MOAs, PAs, CAs, Plans of Action, etc. will be drafted and coordinated by the CRM and approved by the Installation Commander
- Agreement documents are referenced in the Appendixes section of this ICRMP

GIS Management

- The installation maintains maps showing locations of certain significant cultural resources. These maps are maintained by the Environmental Management Office
- According to 32 CFR Part 229, information divulging the location and character of archaeological
 sites should be limited to parties involved in management and/or planning and shall not be
 divulged to the general public. Such confidentiality prevents damage to sites. In the spirit of
 ARPA, all maps of archaeological sites have restricted access. Access will be granted by the
 CRM IAW user need and 32 CFR Part 229

•

8.0 CULTURAL RESOURCES INVENTORY

8.1 Physical Setting

March ARB is approximately 15 miles south of the City of San Bernardino and 50 miles east of Los Angeles. The City of Moreno Valley borders the north and east boundary of the base, the City of Riverside lies to the northwest, the City of Perris lies to the south, and unincorporated areas of Riverside County lie west of the base. The region surrounding March ARB has transitioned in recent decades from a primarily agricultural area to a dense mixture of residential, commercial, industrial/warehouse, and agricultural uses.

As mentioned, the current March ARB is a portion of the former March AFB, which was realigned in 1996. Under this conversion, 4,400 acres of the former March AFB were transferred to the MJPA, including portions of the MFHD. The current March ARB consists primarily of an active runway area containing two runways and associated aviation facilities as well as general personnel support facilities. Land use at the base is generally classified according to functional areas and land use categories that include: administrative, community, housing, industrial, medical, mission, open space, outdoor/recreation, and runway/taxi/apron. The bulk of the acreage and square footage is devoted to runway/taxi/apron and mission related activities and uses.²

Average temperatures in the Riverside County area generally range from the low 50s (degrees Fahrenheit [°F]) in the winter months to high 70s (°F) in the summer months. The region averages about 95 days per year with a maximum temperature over 90°F and five days a year with minimum temperatures below 32°F. Average annual precipitation for Riverside is 10.9 inches, with the majority of the precipitation occurring in November through April. There is a monthly precipitation peak of 2.2 inches in January and February.³

Topography on March ARB is generally flat, and elevations range from 1,480 feet above sea level in the southeast portion of the base and 1,550 feet above sea level in the northwest portion of the base. March ARB is located in the San Jacinto Watershed, an approximately 770-square-mile area that extends from the San Jacinto Mountains to the north and east to Lake Elsinore to the west. The watershed drains into the San Jacinto River, located 6 miles southeast of the base. No permanent surface water bodies are located within

² AFRC, Draft Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base, California, June 2010, 1-3.

AFRC, Draft Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base, California, 3-25.

the boundaries of March ARB. Although no active fault zones have been identified on the base, March ARB is located near two active fault zones: the Elsinor Whittier (13 miles to the southwest) and the San Jacinto (7 miles to the northeast) fault zones.⁴

The base is situated in the northern portion of the Perris Plain, a north-south trending alluvial valley, bounded by low-lying granitic bedrock and a series of tributary valleys defined by four surrounding mountain ranges (San Jacinto, San Gabriel, Santa Ana, and San Bernardino) as well as the San Bernardino National Forest and Cleveland National Forest. Perris Plain alluvial deposits are largely composed of alternating layers of clay, silt, sand, and gravel of mixed composition. Alluvial fill at and around March ARB can vary from only a few feet in thickness to approximately 300 feet in thickness.⁵

The vegetation at March ARB consists of grasslands, disturbed scrublands, riparian areas, and landscaped areas, including lawns. The majority of the western half of the base surrounding the airfield is comprised of open mowed grasslands dominated by a mix of native and non-native species including wild oats, barley, fescues, Russian thistle, Mediterranean grass, black mustard, and field mustard. Within the grassland area are small remnants of coastal sage scrub and disturbed scrublands that include scrub oak, Palmer's goldenbush, and leafy buckwheat. Along the natural and manmade drainage areas on base are remnant riparian areas that consist of Fremont cottonwood, mulefat, narrow-leaf cattail, common sow thistle, sandbar willow, and arroyo willow. The vegetation within the developed areas of the base is comprised primarily of turf grasses, including Kentucky bluegrass, common Bermuda grass, and fescue mixes. Landscaped areas include 36 known ornamental species, such as pines, palms, California live oak, Carob trees, Silktree, iceplant, edible fig, and Eucalyptus.⁶

8.2 Prehistory and History

The following discussion includes a development of both the prehistoric and historic framework for the March ARB. More detailed attention is given to the historic context of the base as the known cultural resources at the base are from this period. The built environment of the base reflects this context, with buildings representing a range of twentieth-century periods including World War I, the interwar period, World War II, and the Cold War era. The prehistoric and historic contexts are primarily adapted from the 2011 ICRMP and other studies completed at the base.

Prehistoric Context

The prehistoric period before the ethnographic period is not well understood in the area surrounding March ARB. Most of the archaeological research done in southern California has focused on the coast, the Channel Islands, and the Mojave Desert – leaving inland areas like Moreno and San Jacinto valleys relatively unexplored. While cultural sequences have been offered for those surrounding regions, to date there is no well-developed model of prehistoric human habitation in the vicinity of March ARB.

Evidence for human occupation of southern California by the end of the Pleistocene era, ca. 12,000-11,000 Before Present, is summarized in the form of highly mobile hunter-fisher-gatherers focused on the now-

⁴ AFRC, Draft Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base, California, 3-8, 3-36.

⁵ AFRC, Draft Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base, California, 3-1, 3-2.

⁶ AFRC, Draft Environmental Assessment for Proposed Military Construction and Total Force Integration at March Air Reserve Base, California, 3-14.

⁷ For a detailed summary of one version of regional cultural history, the reader is referred to Donn Grenda, *Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinor, (*prepared for the U.S. Army Corps of Engineers, Los Angeles District, Statistical Research, Inc., Tucson, Arizona, 1997).

extinct pluvial lakes. By the beginning of the middle Holocene era (ca. 8500 Before Present), populations appear to have become somewhat more sedentary and to have developed a more varied material culture that included beads and ornaments, charmstones, and cogged stones. Deep-basined milling stones from these sites suggest an increased use of seeds in the diet. Site CA-RIV-2798/H at Lake Elsinore, approximately 13 miles southwest of the base and site CA-RIV-6069/8712 near the Lakeview Mountains, approximately 8 miles southeast of the base, contain middle Holocene era ("Pauma Complex") components.

The archaeological record in many areas of southern California reflects little change in material culture or settlement patterns until relatively late in prehistory. Sometime around 1,500 years ago, local groups adopted bow-and-arrow technology and pottery, probably reflecting influences and/or migrations into the area by Takic speakers from the desert regions to the east. Late Holocene-era sites in interior southwestern California typically contain bedrock milling stations (mortars and slicks), Cottonwood Triangular arrow points, pottery vessels, and tools made of bone or shell. By the time of Spanish incursion, native people in the region had adopted a "more complex, consolidated village pattern ... similar to ethnohistorically documented Luiseño and Mountain Cahuilla *rancherĩa* settlements."

In the vicinity of March ARB, the majority of investigated archaeological resources date to the late prehistoric period. Early or middle Holocene sites are rare, leading some researchers to conclude that the area was relatively unpopulated until late in prehistory. However, researchers like Donn Grenda point out that many of the region's inland valleys are subject to flooding, which has caused repeated deposition of sediments that very likely are obscuring part of the archaeological record. He cautions that "models that account only for surface remains are likely to be inadequate as tools for examining the past." Similarly, Michael Lerch and Amanda Cannon note that deep alluvial deposits near the Lakeview Mountains might contain buried cultural remains dating from the earliest period of human occupation. No assessment has been done of the potential for buried archaeological deposits at March ARB.

Ethnography

Moreno Valley and the vicinity have been variously assigned to the Cahuilla, Gabrielino, Luiseño, and Serrano groups. The lack of agreement reflects the early disruption of native peoples in southwestern California with the arrival of the Spanish explorers, military, and missionaries, followed by Mexicans and Euro-Americans. The devastating diseases brought by these intruders wiped out thousands of native people, and many others were taken to the coastal missions or (later) forced onto reservations. By the early twentieth

⁸ Moratto, Michael J. "California Archaeology." Academic Press, San Francisco, California, 1984: 110-113.

Delbert L. True, "The Pauma Complex in Northern San Diego County," *Journal of New World Archaeology* 3, no. 4 (1980): 1-39.

Grenda, Donn. Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore, (prepared for the U.S. Army Corps of Engineers, Los Angeles District, Statistical Research, Inc., Tucson, Arizona, 1997; Lerch, Michael K., and Amanda C. Cannon. Mystic Paavo' - Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California. Statistical Research, Inc., Technical Report 05-34, Redlands, California, Submitted to the County of Riverside, 2008.

Some have argued that there were actually multiple waves of migration over the millennia, the reader is referred to Altschul, Jeffrey H. and Donn R. Grenda (editors) 2002 "Islanders and Mainlanders: Prehistoric Context for the Southern California Bight." SRI Press, Tucson, 2002 and Kroeber, A.L. "Handbook of the Indians of California," Bureau of American Ethnology Bulletin 78 (1925): 578-580, quoted in Lerch, Michael K., and Amanda C. Cannon. *Mystic Paavo' - Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California*. Statistical Research, Inc., Technical Report 05-34, Redlands, California, Submitted to the County of Riverside, 2008.

Joan Oxendine, "The Luiseno Village During the Late Prehistoric Era," (Unpublished Ph.D. Dissertation), University of California, Riverside, 1983, quoted in Lerch, Michael K., and Amanda C. Cannon. Mystic Paavo' - Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California. Statistical Research, Inc., Technical Report 05-34, Redlands, California, Submitted to the County of Riverside, 2008: 20.

Grenda, Donn. Between the Coast & the Desert: Archaeological Data Recovery at the Yukaipa't Site, CA-SBR-1000, Yucaipa, California. Statistical Research. Inc., Technical Series 70, Tucson, Arizona, 1998; 11.

Lerch, Michael K., and Amanda C. Cannon. Mystic Paavo' - Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California. Statistical Research, Inc., Technical Report 05-34, Redlands, California, Submitted to the County of Riverside, 2008: 13.

century, when the first ethnographers tried to reconstruct the traditional territories of these groups, it was challenging to determine who had been living in which area, at what point in time.

Originally, Lowell Bean attributed the vicinity of March ARB to the ethnographic Cahuilla, whose lands once extended from the vicinity of what is now Riverside, southeast to Borrego Springs and eastward to the San Bernardino Mountains. Lowell Bean and G.H. Phillips both report Cahuilla villages in the vicinity of March ARB, including three along the Whitewater River and three in the Riverside and Perris Valley areas. Subsequently, however, Bean revised his thinking, and states that "we are able to confirm that March AFB is within the traditional ancestral cultural area of the Serrano, as acknowledged in the Treaty of 1851…"

Other ethnographers, however, have mapped the region differently: Alfred L. Kroeber places the location of March ARB in Luiseño territory, Phillip Drucker attributes it to the Serrano, and William Strong suggests it was "probably Gabrielino, though occupied by Mountain Cahuilla in the Mexican period." Ethnohistorian John Johnson believes that the area was in Serrano territory, and definitely not in Luiseño lands. As Michael Lerch and Amanda Cannon conclude for the nearby Lakeview Mountains, "the protohistoric and historic-period occupation of the ... area cannot be conclusively attributed to a single modern group." The same can be said for the March ARB vicinity.

It is possible that this somewhat stark landscape was a boundary zone between groups: Heizer draws the boundaries between the Gabrielino, Serrano, and Cahuilla very near where the March ARB is located today, implying either a boundary zone or an area of overlapping use. In any case, the early ethnographers were studying a place that had already seen more than a century of disruption and outside influence from the Spanish, Mexican, and American governments, influencing native lifeways and traditional territorial boundaries in the area.

In the protohistoric and contact periods, Cahuilla, Serrano, and interior Gabrielino people practiced a hunter-gatherer lifestyle, exploiting local food resources like deer, pronghorn, rabbits/hares, pinyon nuts, acorns, mesquite pods, and various seeds and tubers. As with most California hunter-gatherers, they established year-round villages at reliable water sources, especially the major rivers (San Jacinto, Santa Ana, San Luis Rey) and their larger tributaries. Temporary or seasonal camps were used when collecting resources that were father from the main villages; plants and animals often would be partially processed (ground, dried, butchered, etc.) at these camps for easier transport to the year-round habitations. Lowell Bean reports that the three groups "interacted regularly by intermarriage, trade, ritual, and war."

¹⁹ Bean L.J. "Cahuilla." In *Handbook of North American Indians*. Volume 8. Washington, D.C.: Smithsonian Institution, 1978: 576.

Bean L.J. "Cahuilla." In Handbook of North American Indians. Volume 8. Washington, D.C.: Smithsonian Institution, 1978: 576; Phillips, G.H. Chiefs and Challengers. Berkeley, California: University of California Press, 1975.

Bean, Lowell John. "Comment Letter to the US Air Force dated August 28, 1997." In Baksh, "Where Territories Merge: An Ethnohistoric and Ethnographic Review of Traditional Native American Territories and Traditional Cultural Properties for March Air Force Base, California, Michael, Andrew Robert Pigniolo, and Richard Bark, Tierra Environmental Services, San Diego, for Earth Tech, Inc., Colton, California, 1999: 4-61.

Kroeber, A.L. "Handbook of the Indians of California," Bureau of American Ethnology Bulletin 78 (1925): Plate 57; Drucker, Philip. "Culture Element Distribution: VI - Southern California." University of California Anthropological Records 1(1), 1937: Figure 1; Strong, William D. "Aboriginal Society in Southern California." University of California Publications in American Archaeology and Ethnology, Volume 26 (1929): Man 7

JRP. Integrated Resources Management Plan, March Air Reserve Base (March ARB), Riverside County, California. Prepared for Civil Engineering Support/Environmental Management Office, March Air Reserve Base, April 2011.

Lerch, Michael K., and Amanda C. Cannon. *Mystic Paavo' - Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California*. Statistical Research, Inc., Technical Report 05-34, Redlands, California, Submitted to the County of Riverside, 2008: 22.

Heizer, Robert F. "Handbook of North American Indians: Volume 8 - California." Smithsonian Institution, Washington, D.C, 1978: ix.

²² Bean L.J. Cahuilla. In *Handbook of North American Indians*. Volume 8. Washington, D.C.: Smithsonian Institution, 1978: 575.

Trade relationships, territorial boundaries, socio-political and religious practices, and traditional patterns of settlement and subsistence all began to change with the establishment of missions San Gabriel and San Luis Rey in the second half of the eighteenth century. Native people were also impacted by the arrival of exotic diseases; the smallpox epidemic of 1863 wiped out perhaps a third of the Cahuilla and similarly devastated the neighboring groups. Under the American system of government schools, Indian Services, and land divisions, the social, political, and religious institutions among the native people were suppressed. By the beginning of the twentieth century, most of the native people of the region lived on or near reservations.²³

Historic Context

This historic context is adapted from previously developed historic contexts for March ARB. JRP Historical Consulting Services, LLC's (JRP's) 1992 *National Register of Historic Places Registration Form for March Field Historic District* addresses the early development of March Field in the decades following its establishment in 1918. Patti Johnson's 1991 *Inventory and Evaluation of World War II Structures: March Air Force Base, Riverside California* provides a discussion of March Field during World War II. William Manley's 1995 *Historic Building Inventory and Evaluation: March AFB, Riverside County, California* and its update, JRP's 2013 *Cold War Cultural Resources Inventory and Evaluation, Update Report, March Air Reserve Base, Riverside County, California*, present a history of the base focusing on the Cold War period. This historic context information was augmented by primary and secondary source research completed for this ICRMP between November 2018 and February 2019 at the March Field Air Museum (including discussions with knowledgeable individuals), National Archives at Riverside, University of California, Davis Shields Library, University of California, Riverside Special Collections and University Archives, March ARB collections and records, and the Moreno Valley Historical Society.

World War I Era (1917-1918)

America's entry into World War I and the corresponding development of the country's nascent aeronautical capabilities spurred early development of March Field. Between 1917 and 1918, the Army Air Service oversaw construction of at least ten new air stations, most of rudimentary construction with scattered wood frame buildings and modest air strips. March Field, initially named Alessandro Aviation Field, was established in early 1918 and was of standard Army design, with a modest assemblage of support buildings and a 50-acre landing strip. JRP's *National Register of Historic Places Registration Form for March Field Historic District* addresses this early period, discussing the factors behind March Field's rapid development into one of the west coast's key Army Air Corps installations. The following discussion is primarily derived from the nomination completed by JRP, with additional information added, as noted.

Plans for expansion of the Army Air Service were incomplete when the U.S. entered World War I on April 6, 1917. Early in March of that year, the War Department sent General William L. Sibert, who became commander of the American 1st Division in France under General Pershing, to southern California to look for a site to establish a west coast Army airfield for coastal defense and pilot training. The Riverside Chamber of Commerce appointed one of its members, Arthur Sweet, a representative of the Riverside District Aero Club of America, and local attorney Miguel Estudillo to promote a site 10 miles southeast of Riverside on the Alessandro plains. Instructions from Washington, however, gave preference to a site closer to the ocean and General Sibert eventually chose to establish the west coast airfield at the existing Camp Trouble site (renamed Rockwell Field) on North Island in San Diego. Nevertheless, the War Department had been sufficiently impressed with the climate, topography, and general flying conditions in the vicinity

²³ Bean L.J. Cahuilla. In *Handbook of North American Indians*. Volume 8. Washington, D.C.: Smithsonian Institution, 1978: 584.

²⁴ JRP, National Register Form for March Field; Johnson, Inventory and Evaluation of World War II Structures; Manley, Inventory and Evaluation, JRP, Cold War Cultural Resources Inventory and Evaluation.

of Alessandro that it soon established an emergency landing strip for student flyers from Rockwell Field on a vacant tract of land near the old Alessandro railroad depot.²⁵

Members of the Riverside Chamber of Commerce continued to lobby for the establishment of a second southern California airfield at Alessandro. A permanent Aviation Committee was appointed by the Riverside chamber, led once again by Arthur Sweet and another prominent citizen, Frank Miller, owner of the Mission Inn. The committee prepared a comprehensive prospectus on the Alessandro site emphasizing its excellent flying conditions, freedom from flight hazards such as tall buildings or trees and overhead wire, its topographical advantages, good prevailing winds, persistent sunshine, and general healthy conditions. The Aviation Committee was able to gain the support of Hiram Johnson, former Governor and a U.S. Senator at the time. It was at Johnson's insistence that the War Department agreed to investigate the feasibility of expanding the emergency landing strip at the Alessandro site into a permanent Army Air Field.²⁶

As further incentive to the government, the chamber proposed to negotiate a favorable lease of a 640-acre tract which they offered to the government rent-free with an option to purchase the entire tract at any time within three years for \$100 per acre. With this prospectus in hand, an investigating committee comprised of Maj. Benjamin F. Castle (Signal Corps), Lt. Col. George H. Crabtree (Medical Corps), and Captain Alphonse Boyriven of the French Flying Corps arrived from Washington on January 18, 1918 to meet with Sweet, Miller, and other members of the Riverside Chamber of Commerce. After making a thorough inspection of the Alessandro area, the commission agreed to lease the 640-acre Hendrix Estate from June 1918 through June 1923 for the sum of \$1 with an option to purchase for the duration of the lease.²⁷

The original boundaries of March Field encompassed 640 acres. Nine additional acres were purchased to construct an entrance road from the San Diego-Los Angeles inland highway one-half mile east of the base. These boundaries remained unchanged until October 1941, when the approaching crisis of World War II necessitated a quarter-mile expansion of the boundary on all four sides of the perimeter. To hasten a decision by the War Department, the Riverside Chamber's Aviation Committee arranged with the Santa Fe Railroad to construct a branch line into the property for use by the Army. In addition, the committee gained assurances from the Southern Sierra Power Company, Pacific Telephone, and Western Union that they would be ready to extend their lines and begin installation as soon as the Army was ready.²⁹

Troops began arriving at the Alessandro Aviation Field from Rockwell Field on February 26, 1918. Led by aviation pioneer Sergeant Charles Garlick, three servicemen, local muleskinners, and a team of mules began clearing the area and making way for aircraft to begin aviation operations at the site.³⁰ On March 20^{th,} the airfield was officially renamed March Army Air Field (also known as March AAF, or more commonly referred to as March Field), in honor of 2nd Lieutenant Peyton C. March Jr. (son of the Army Chief of Staff Maj. Gen. Peyton C. March). March had been mortally injured in February of that year in an aviation accident at Hicks Field in San Antonio Texas, later dying in Fort Worth, Texas.³¹ The World War I era

²⁵ JRP, National Register Form for March Field.

²⁶ Bruce Harley, *March Field Story*, 1918-1978. Published by March Air Force Base, California, 1978: 12.

²¹ JRP, National Register Form for March Field.

JRP, National Register Form for March Field.

²⁹ Bruce Harley, *March Field Story*, 1918-1978. Published by March Air Force Base, California, 1978: 12.

Bruce Harley, *March Field Story, 1918-1978*. Published by March Air Force Base, California, 1978: 13-15.

³¹ Bruce Harley, *March Field Story, 1918-1978*. Published by March Air Force Base, California, 1978: 13-15.

buildings at March Field were of standard Army design, one-story temporary wood-frame structures clad in board-and-batten siding and resting on wood foundations.³²

The wartime layout of March Field was based upon a standard army design replicated at several aviation fields erected during World War I, including Scott and Chanute Fields in Illinois, Brooks and Kelly Fields in Texas, and Mather Field near Sacramento, California. Twohy Brothers Construction Company of Spokane, Washington, received the construction contract and was led and represented by George Boschke. The Army then assigned Captain Caruthers from Rockwell Field to take over for Garlick. Both men were committed to efficiently and economically construct the base, and they were assisted by numerous military personnel who were as part of the construction crew. Additional logistical support was provided by the Riverside Chamber of Commerce through arranging offices at the Riverside Inn and paying for additional roadway improvements leading to the base.

The buildings at March Field were stretched out along the north boundary of the military reservation. The main boulevard ran in an east-west direction, bordered on the south-southwest by a long row of hangars, and on the north by barracks, workshops, hospital, headquarters, warehouses, mess halls, and the commanding officer's quarters. North of the central boulevard, residences and barracks were clustered on the two wings with the service and industrial facilities mixed together at the center surrounding a tall water tower. The 1918 base was never landscaped, in fact, the only trees appearing in historic photographs is a remnant grove of olive trees located near the commanding officer's residence at the northeast corner of the base. The base received permission from the War Department to leave the grove intact during construction.³⁵ Open spaces between buildings and the 50-acre landing strip were sown with grass to reduce dust. The remainder of the 640 acres were graded, leveled, and treated with a coat of oil.³⁶ Five training squadrons, each with 250 flyers and 19 airplanes, and 2,000 support personnel were assigned to active duty at March Field during the remainder of the war.

Interwar Period (1918-1941)

Training continued until mid-March 1919. By that time, 50 officer-students had graduated, and 170 cadets had successfully completed the primary aviation training course. After the final class graduated, 70 percent of the enlisted personnel and many administrative officers were discharged or transferred to other Army installations. Six months passed before the War Department announced that March Field would remain open as an active installation. During its 1919 session, Congress passed a bill authorizing purchase of the 640-acre site along with several other World War I cantonments located across the country. The federal government acquired a deed to the property on May 22, 1920. By the fall of 1920, the Army Air Service had resumed regular courses in primary pilot school at two sites: one was at March Field, California and the other at Arcadia Field, Florida. Graduates of these programs went to advanced training at Kelly Field, Texas.³⁷

The decision to resume flight training at the "Air Service Pilot School March Field" brought a request from the Army Air Service for Congress to provide funding in its 1922 appropriation bill for construction of permanent buildings at March Field. The Air Service instructed the Quartermaster Corps to prepare cost estimates for 35 sets of officers' quarters, one commanding officer's quarters, and a long-distance radio

³² JRP, National Register Form for March Field.

Bruce Harley, March Field Story, 1918-1978. Published by March Air Force Base, California, 1978: 13-15.

Bruce Harley, *March Field Story, 1918-1978*. Published by March Air Force Base, California, 1978: 13-15.

Bruce Harley, March Field Story, 1918-1978. Published by March Air Force Base, California, 1978: 13-15.

³⁶ JRP, National Register Form for March Field.

³⁷ JRP, National Register Form for March Field.

hut. Influenced by the concerns of local citizens, Major Barton K. Yount, commanding officer of March Field, requested that the proposed structures be designed in a regionally appropriate architectural style, "a Mission Type of architecture."³⁸

Yount had been in close consultation with Frank Miller, owner of the Mission Inn, about the construction of permanent facilities at March Field. Miller informed Yount that the Riverside community preferred March Field be designed in the Mission Revival style by an established southern California architect. Miller offered the services of Arthur B. Benton, architect of the Mission Inn, to draw up a "tentative plan" free of charge for the government. Yount consulted with Benton and later submitted blueprints and a proposal for laying out 35 Mission-style hollow tile and cement post officers' quarters arranged in a "court type" setting on a 25-acre tract of privately-owned agricultural land adjacent to March Field. According to the Benton-Yount plan, all permanent buildings constructed in the future at March Field would conform to this architectural style.³⁹

Major-General Mencher, chief of the Air Service, agreed with Yount's proposed building program, but the "call for retrenchment" in military spending during the early 1920s, wrote Mencher, made it impossible to construct any quarters at Army Service air fields for the next few years. When the Washington Disarmament Conference forced Congress to reduce the number of personnel in the 1922 Army appropriation bill, the Air Service had no recourse but to phase out flight instruction at March Field. The Air Service Pilot School was discontinued, and the detachment disbanded on October 1, 1921. A reduced pilot training program continued at Arcadia Field, Florida, and March Field was garrisoned for a short period by the 19th Aero Pursuit Squadron and the 23rd Aero Bombardment Squadron. By the end of 1922, however, these squadrons transferred to foreign duty and only six officers and two civilian employees remained. On April 5, 1923 the base was placed in caretaker status.⁴⁰

In March 1926, Congress enacted Public Law No. 45 which authorized the Secretary of War to dispose of 43 military reservations and to deposit the money received from those sales into a special fund designated the "Military Post Construction Fund." This money was earmarked for permanent construction at military posts until fully expended. The Act called for submission of annual estimates along with a statement of the specific construction projects covered under each estimate. The program was aimed primarily at taking care of the housing and hospitalization needs of the Army. Many of the buildings used to shelter the Army were old and obsolete. Some had been constructed prior to the Civil War and many more were temporary structures erected during World War I. Lack of sufficient permanent shelter after the war necessitated use of these temporary buildings beyond their intended life of two or three years. Furthermore, new military activities, such as that of the Army Air Service, required new and special types of technical buildings for support of military aviation.⁴¹

The Army Air Service, separated from the Signal Corps in 1918, became the Army Air Corps by virtue of the passage of the Air Corps Act of July 2, 1926. The Act left Army aviation under General Staff control, but it also increased the air organization's military strength and its prestige and influence within the War Department. New units of the Air Corps became priority locations for the expenditure of military post construction funds. As a feature of this renewed interest in Army aviation, Congress authorized a \$147 million five-year program (1927-1932) to expand the Army's pilot training program and to modernize its tactical units. The Air Corps began with 919 officers, 8,725 enlisted men, and 1,254 airplanes. The 1926

³⁸ JRP, *National Register Form for March Field*.

JRP, National Register Form for March Field.

JRP, National Register Form for March Field.

⁴¹ JRP, National Register Form for March Field.

act authorized a buildup that would roughly double the size of the Air Corps and strengthen their presence at garrisons in Hawaii, the Canal Zone, and Alaska. Bombardment wings would be permanently deployed on the east and west coasts along with an attack wing on the southern border of the U.S. 42

Although the Army maximized use of its only primary flying school at Brooks Field, Texas, alone it could not accommodate all of the flying cadets entering the Air Corps training program. One of the initial steps toward execution of the Air Corps five-year national expansion plan was a reorganization of the pilot training program that resulted in removing March Field from caretaker status. The Air Corps rehabilitated March Field in two phases. To meet immediate needs, the Air Corps reconditioned the old and obsolete World War I facilities and opened a second primary air training facility at March Field for 40 officers and 400 students. By the end of its five-year program, the Air Corps planned to consolidate all the primary flight training programs of both March and Brooks fields, as well as the training tasks of the advanced training program at Kelly Field, to a new 2,300-acre site northeast of San Antonio, Texas, called Randolph Field. The Air Corps program would then provide for one air wing each on the east and west coasts, one in the south, one each in Panama and Hawaii, one air group on the northern U.S. border, and another in the Philippines. By the end of the Air Corps' five-year program, March Field would be the permanent home for the Air Corps west coast bombardment wing.⁴³

The office of the Quartermaster General had primary responsibility for construction and maintenance of buildings of the Army and operating the utilities at the various military posts from 1885 until 1941. The task of carrying out the new building program authorized by Congress in 1926 fell to the Quartermaster General. The War Department construction programs placed a priority on new barracks, officers' quarters, and hospitals. These building types were among the first erected at March Field, but new posts for the Air Corps provided additional problems because an entire new post had to be planned from the ground up. March Field is a significant example of military post planning, because it was the first complete aviation post laid out and built by the Quartermaster Corps and the Army Air Corps during peacetime. Whereas the war-time Construction Division of the Quartermaster Corps emphasized expeditious procedures to meet War Department requirements, employment of temporary construction methods, and standardized plans for both base layout and individual structures, during peacetime the construction program of the Army established a different set of criteria. In contrast, peacetime construction emphasized input into the planning process from prominent city planners and architects, variety of structure and installation, aesthetics with functional utility, and the use of appropriate local building materials and architectural styles. These values were emphasized by both Congress and Army officials alike during the 1926 hearings of the Subcommittee on Military Affairs.44

The Construction Division of the Quartermaster Corps, organized in 1920, was the only office of the Army provided with a cadre of high quality, professional architects, planners, and designers. In addition to civilian architects employed through the civil service, Quartermaster General B. Frank Cheatham (1926-1930) employed George B. Ford, a leading figure in the "City Beautiful" movement and internationally renowned city planner, and Arthur Loomis Harmon, an equally prominent architect, to serve as consultants to review and advise on the layout and architectural design of major new army posts. Local constructing quartermasters also prepared plans and specifications, and occasionally private architects, working closely with a construction quartermaster, were employed to develop regionally appropriate architectural models. These drawings were submitted to the Design Section of the Construction Division, which prepared all final plans, specifications, and working drawings. Once completed, these plans were submitted for approval

⁴² JRP, National Register Form for March Field.

⁴³ JRP, *National Register Form for March Field.*

⁴⁴ JRP, National Register Form for March Field.

and/or modification by the consulting architect and city planner. The approved sketches and post plans were forwarded through the Adjutant General to the Corps Area and Post Commanders, and possibly also to the Chief of the Military Branch (Air Corps), for comments and returned through the same channels. If there were objections, the project was redesigned; if not, it went to the Secretary of War for approval. Once the Quartermaster General was notified of approval, the Building Section was free to proceed with preparing contract specifications which were forwarded to the Construction Quartermaster to advertise for bids. 45

Colonel William C. Gardenhire, Quartermaster Corps, was appointed to oversee the reconstruction of March Field in the spring of 1927. Arriving from Louisville, Kentucky with his wife, he took up temporary headquarters at Frank Miller's Mission Inn in Riverside. Over the next five years Colonel Gardenhire became closely identified in the local community with the developments at March Field. He served as post quartermaster and constructing quartermaster at March Field until his retirement from the Army in 1932. Gardenhire's first tasks at March Field were to survey the remaining World War I buildings and utilities, report on their condition, and develop a plan for rehabilitation of the old post for temporary occupation. Electrical hook-ups, construction of telephone lines, reconstruction of the water distribution system, sinking of wells in search of a reliable potable water supply, and procurement of a pumping plant were among his first priorities. Since permanent barracks and quarters would be erected shortly at March Field, the Ouartermaster General instructed Gardenhire to repair the old temporary wooden barracks and residences only to the degree essential to make them habitable until permanent buildings were ready for occupancy. Underpinnings, stringers, joists, and floors were to receive minimal repairs, when necessary, and the buildings' exteriors were not to be painted. The Air Corps, which was responsible for funding repairs to technical Air Corps buildings, such as hangars, shops, dope houses, and the flying field, also anticipated the imminent construction of new facilities and only made minor repairs to its buildings. 46

While Col. Gardenhire labored to rehabilitate the old post, local Riverside interests mobilized to influence the Army to construct a new army base that would harmonize with the image projected by the City of Riverside. Major J. A. Cummings of the Quartermaster Corps Reserves in Riverside, whom Gardenhire characterized as "the Self-Appointed Ambassador, without folio" traveled to Washington, D.C. in March to confer with the authorities at the Quartermaster General's Office on the type of architecture to be used in construction of March Field. Upon his return, he met with G. Stanley Wilson, a prominent Riverside architect who had designed 16 local schools and the Riverside Auditorium and Soldiers Memorial and encouraged him to pursue a commission for designing the new post. Wilson wrote General Yates, chief of the Construction Services of the Quartermaster Corps, offering his professional services and lobbying for adoption of an architectural style for the new army barracks and quarters at March Field in keeping with the buildings and grounds that beautified the City of Riverside. Inspired by the Mission Inn, the architectural style that predominated in the city, he wrote, was elegant and graceful in its simplicity, and not extravagant or expensive. Major Cummings, who supported Wilson in his quest for the job as architect of the new post, sent recent photographs of Wilson's Riverside school buildings and the Mission Inn to General Yates as samples for his consideration. General Yates confided to Wilson in a correspondence dated April 6, 1927 that the Quartermaster Corps had already decided to build in a style that would "harmonize with the best traditions of the historical architecture of Southern California," but he informed Wilson that planners and architects within the Quartermaster Corps in Washington, D.C. would be responsible for developing the layout and building plans. 47

⁴⁵ JRP, *National Register Form for March Field*.

JRP, National Register Form for March Field.

⁴⁷ JRP, National Register Form for March Field.

While Cummings and Wilson lobbied General Yates, Colonel Gardenhire was working directly with Frank Miller of the Mission Inn and other architects to develop recommendations for a detailed site plan and a Mission or Spanish Colonial Revival style design. One of the architects consulted by Miller and Gardenhire was Myron Hunt, a Director of the American Institute of Architects and a leading architect in California who also recently completed the St. Francis Atrio at the Mission Inn. The Atrio contains the Famous Fliers' Wall where many of the world's greatest pioneer aviators have sought the protection of St. Francis, patron saint of birds, by "signing" the wall of the chapel with inscribed copper wings. Another prominent advisor to Gardenhire was Charles H. Cheney, a graduate of the Ecole des Beaux Arts in Paris, who specialized in city planning and was responsible for Palos Verde Estates near Los Angeles. Drawing upon available California models of community planning and residential architecture, Gardenhire and his consultants worked to develop several different types of Mission Revival style houses to create a setting for them that would "do away with the sameness of appearance" that detracted from the beauty of nearly all military posts.⁴⁸

Besides the constructing quartermaster, Colonel Gardenhire, the other key military officer involved in planning March Field was the post commander. In April 1927, Major Carlyle H. Wash transferred from the advanced training facility at Kelly Field, Texas to take command of the flying school at March Field. Major Wash brought with him the 47th School Squadron from Brooks Field to inaugurate the new training program. The 70th Service Squadron from Kelly Field arrived a month later to reactivate the base and rehabilitate the existing technical facilities. By the end of July, this task was nearly completed.⁴⁹

Shortly after his arrival at March Field, Major Wash began working on plans for the layout of the new airfield. Like Gardenhire, Wash also consulted with Myron Hunt on proposed layouts of the new airfield. On April 20, 1927, he forwarded to the Chief of the Air Corps, Major General Mason M. Patrick, three alternative plans (Plans A, B, and C) for the layout of permanent Air Corps technical buildings. The key to each of the plans from the post commander's perspective was the placement of six proposed 75 x 500 x 20 bomber hangers (though eight hangars were ultimately constructed), their functional utility for pilots and maintenance crews, and the ability of the Air Corps to take advantage of prevailing winds.⁵⁰

The Air Corps and Quartermaster Corps conducted further investigations before finalizing a plan for March Field. During the summer of 1927, the chiefs of both departments made separate trips to the west coast to inspect the airfield and look over the proposed plans onsite. Brig. General Yates, head of the Construction Service Quartermaster Corps, arranged a meeting between Quartermaster General Cheatham, Hunt, and Gardenhire during his inspection visit on June 16, 1927. Cheatham was guest of honor at a luncheon at the Mission Inn attended by Hunt, Gardenhire, members of the Riverside Chamber of Commerce, and other civic organizations. On the following day, Cheatham requested that the Design Branch of the Construction Service forward sketches of the proposed layout plans, perspectives of the hangars, and plans and elevations for the administration building, barracks, officers' quarters, and technical buildings to Hunt. These materials were sent to Colonel Gardenhire through H.M. Nurse of the Construction Service on June 24th. 51

Three weeks after General Cheatham's visit, General Patrick of the Air Corps inspected March Field with orders from the Secretary of War to make a final determination of the best layout. On July 6th he visited the site with Major Wash and Col. Gardenhire and studied the proposed layout and sketches of the new buildings prepared by the constructing quartermaster and post commander in consultation with Myron

⁴⁸ JRP, National Register Form for March Field.

JRP, National Register Form for March Field.

⁵⁰ JRP, *National Register Form for March Field*.

⁵¹ JRP, National Register Form for March Field.

Hunt. On the following day, he notified his office in Washington, D.C. that he had approved a revised plan for the layout of the new buildings at March Field. The general layout corresponded closely with Major Wash's proposed Plan B, but the precise location of individual buildings was as yet undetermined. General Patrick was especially pleased with the building design work noting that Gardenhire had "enlisted the services of an excellent architect." The officers and non-commissioned officers' quarters, wrote General Patrick, would be built in "the Spanish style, a front section with two wings enclosing a court in the rear. They will be low one-story houses, of course with slightly different treatment of the front and of the main entrance in order to avoid too great monotony." Design details would be added to the new standard Air Corps hangars to make them compatible with the architectural style of the remaining structures on the post.⁵²

Construction at March Field proceeded as military funds became available. The first wave of construction included officer's quarters, non-commissioned officer's quarters, the commanding officer's quarters, and bachelor officer's quarters. In addition, a variety of mission-support facilities were erected, including a headquarters building, photo-parachute-armaments-radio huts, and a hospital. This also included eight hangars that were constructed in 1929 (Building 385, which was one of these eight hangars, was demolished in 2017). Construction additionally included the development of roads, sidewalks, curbs, culverts, and water utility facilities. Following this initial spate of construction, several other key projects continued through the early 1930s, including the construction of the war department theater, laundry, post gymnasium, and the officer's club and mess hall. By 1932, most of the construction for the base's redesign was complete, with the central parade grounds flanked by the new base headquarters, a firehouse, barracks, and a new hospital.⁵³ Formal landscaping was also included in the redesign, with palm trees and areas of manicured lawns dispersed throughout the base's administrative and living areas.⁵⁴

The design of the installation was divided into seven distinct programmatic sectors, all of which were interdependent entities that enabled the base to operate as a self-sufficient installation. The buildings were generally grouped according to function: officers and non-commissioned officers family Quarters; hangars; industrial buildings; medical buildings; recreational/social buildings for enlisted personnel; barracks; and officer's recreation/social buildings. This programmatic structuring was emblematic of the City Beautiful design movement and dominant military planning theories of the period, which both sought to order the built environment by function (see Figure 1). Across all sectors, the buildings in the district were remarkably unified in their architectural tone, with a universal reference to the Mission Revival theme of the base.

For the Army Air Corps, the first half of the 1930s was an era of great transition. It was a time of rapid change in air doctrine, mission, organization, and equipment. Doctrinally, the period produced more clearly defined employment concepts. Likewise, it bred a fervent belief among Air Corps officers that independent strategic bombardment could achieve decisive results in warfare, and that air power alone could prevent a hostile invasion of the U.S. Organizationally, it was an era of centralization. The War Department allowed the air arm's striking elements, previously divided among the various ground commanders, to be concentrated under a senior Air Corps commander in one General Headquarters Air Force. In addition, it was a decade of rapid technological advancements in aeronautics, spawning long-range, high altitude heavy bombers such as the B-17 that could turn the potential of air power into reality. These and other changes strengthened the Air Corps as a combat force and better prepared it to meet the challenges of World War II.⁵⁵

⁵² JRP, National Register Form for March Field.

Butler, William J. *Images of America: March Air Force Base*. Arcadia Publishing, 2009: 23.

⁵⁴ Butler, William J. *Images of America: March Air Force Base*. Arcadia Publishing, 2009: 26

⁵⁵ JRP, National Register Form for March Field.

In 1933 the Muroc bombing range (later Edwards AFB) in the Mojave Desert was opened as an auxiliary installation for bombing practice by March Field pilots and their crews. Expansion of this facility in 1938 established March as the central base for bombing and gunnery training. Recognition of the increasing significance of bombing as an attack force further enhanced the reputation of March Field. As the buildup for World War II began General Headquarters Air Force constructed a temporary tent city for 280 men in an open area at the rear of one of the barracks. On July 29, 1938 a revised layout plan for March Field was approved that authorized construction of a new permanent barracks (Building 456).⁵⁶

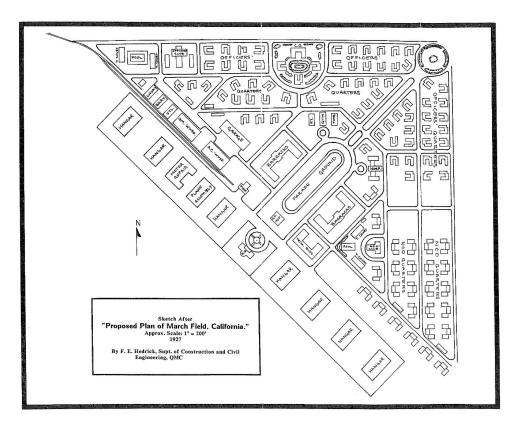


Figure 1. Proposed Plan of March Field

In 1940, the beginning of National Guard anti-aircraft training boosted the number of personnel at March Field. The number of people stationed at March Field increased from 125 officers to 250 and from 1,500 enlisted to 3,600 in the few months following the opening of this training program. By October 1940, the War Department had decided to open a new anti-aircraft artillery camp, designated Camp Haan, west of the main highway. By the end of the year, the War Department more than doubled the size of March Field by adding 920 acres to the north, east, and south of the base. The Air Corps built new runways, which were longer and with thicker paving. A great number of temporary wood-frame buildings were also erected between 1940 and 1943, some of them within the historic triangle, but most outside the older base in the newly acquired regions of the post. New additions included barracks, administrative buildings, hospital facilities, and an array of operational support shops.⁵⁷

⁵⁶ JRP, National Register Form for March Field.

⁵⁷ Johnson, *Inventory and Evaluation of World War II Structures*.

In the immediate years prior to World War II, one important development occurred that bolstered military morale: the United Service Organization (USO). The USO was formed in February 1941 with a mission to provide a "home away from home" for servicemen. This included morale and recreation activities, and even entertainment and live performances. Bob Hope was one such entertainer who volunteered to perform for the troops, travelling with the USO and performing all over the world throughout his career. Hope's first USO show was in May 1941 at March Field where he performed a live radio broadcast from the base's gymnasium, kicking off what would become a decades-long dedication to performing for the men and women of the U.S. armed forces, no matter where they were sent.⁵⁸

World War II Era (1941-1945)

America's entry into World War II initiated the third phase of significant construction at March Field. The 1991 *Inventory and Evaluation of World War II Structures: March Air Force Base, Riverside California* addresses this period, focusing primarily on March Field's training program during World War II, and the buildings necessary to support this function.

In 1939, as the war in Europe threatened to become global in scope, the U.S. began preparations to improve its air defense capability in an effort to defend against invasion pending a general mobilization. At this time the Army consisted of about 200,000 men, and when President Franklin D. Roosevelt announced the first peacetime draft in the fall of 1940, it became imperative for the Army to provide adequate housing for the large number of new inductees. This situation was complicated by the fact that during World War I, troops had been stationed only briefly in the U.S. before being transferred overseas for training, and the level of accommodations at these domestic bases could be minimal. However, this mobilization effort would require that large numbers of soldiers be stationed in a large single location and trained there for an indefinite period of time. Troops stationed indefinitely required better accommodations than those on a brief stopover. The vast majority of this new army was "citizen-soldier" draftees and public perception of what constituted decent and healthy housing had changed appreciably since World War I. The standard of living for Americans had improved despite the Depression, and public pressure was brought to bear to include more of the comforts of home for the soldiers.⁵⁹

The Selective Service Act provided that no one could be sworn into the service unless the Army could provide adequate shelter, sanitary services, water supplies, heating and lighting, and medical care essential to public and personal health. This limited the Army's troop housing options. No longer could the Army house men in rough canvas tents thrown up in vacant fields or in warehouses converted to dormitories. ⁶⁰

An increase in troop strength to 1,200,000 by June 1940 required construction of new cantonments as well as expansion of existing facilities such as March Field. By the time America entered the war in December 1941, there were 1,644,000 troops in uniform. At war's end, that number had grown to 5,900,000.

The answer to the problem of providing adequate shelter to millions of troops in a timely fashion was the construction of temporary structures along the lines of the "600 Series" used during World War I. Modifications to upgrade the level of accommodations were necessary, however, and providentially, the Army had precisely what was needed. Plans for a "700 Series" had been drawn up in the 1930s by a group of architects under Col. Hartman. The roots of the "700-Series" extended back to 1928, when permission to update the World War I cantonment drawings came down from the General Staff to the Quartermaster

⁵⁸ March Field Air Museum. "Bob Hope and the USO: 1941-1991." Exhibit, 2019.

Johnson, Inventory and Evaluation of World War II Structures.

Johnson, Inventory and Evaluation of World War II Structures.

⁶¹ Johnson, *Inventory and Evaluation of World War II Structures*.

Corps. A few rough sketches gained approval the following year, but no further work was done. In 1934, when Col. Hartman was named to command the Construction Division of the Quartermaster Corps, he called for a complete revision of the plans. 62

In the spring of 1937, a crew of architects and draftsman completed an initial set of revised drawings. Col. Hartman appropriated over \$250,000 in work relief funds in the fall of the following year to obtain a warehouse as workspace for his specialized crew. Work on the plans proceeded steadily but seemingly without purpose since the Protective Mobilization Plan of 1938 did not call for a significant amount of actual construction. 63

These plans became very important in 1940, however, with the huge influx of draftees. But when Col. Hartman reviewed them, he found that some plans had been altered so extensively that they were rendered useless, and the remainder of the plans had disappeared. Hartman assembled a number of the veteran employees from his previous taskforce to redraw the essential plans and he was thus able to provide the revised "700 Series" plans on schedule.⁶⁴

Five principles guided the mobilization construction plans: speed, simplicity, conservation of materials, flexibility, and safety. Speed was given the highest priority, and it was in the interest of achieving this speed that simplicity came into play. Wood was used in standard sizes where possible. Complex framing and interior framing were avoided or omitted. Interior electrical work, plumbing, and other mechanical facilities were kept to bare necessities.⁶⁵

New construction at March Field began as early as 1939. However, 1941-42 was the most productive construction period. As part of the country's mobilization effort, this massive construction program was an unprecedented undertaking. Barracks, warehouses, supply rooms, and expanded utilities were all part of the program. Anti-aircraft artillery training began at March Field in 1940 and trainees for this activity more than doubled the manpower at the base. In addition, the War Department began construction of Camp Haan as a designated anti-aircraft artillery training area in October 1940. Although Camp Haan was not officially part of March Field at that time (it was absorbed after the war, becoming known as West March; however, it is no longer extant), it did become involved in the social and military life of the base. Construction of Camp Haan directly affected March Field to the extent that it increased traffic at both facilities and required the realignment of U.S. Highway 395. The purchase of an additional 950 acres to the north, east, and south of March Field allowed for runway expansion and provided the additional space required to accommodate the large number of planned temporary buildings. 666

In 1942, after completion of the major building program at March Field, the Army acquired an additional 625 acres to extend the northwest runway. Several other late additions to the mobilization construction program occurred after most construction activity had ended. Runways received attention in 1944, with additional parking and landing areas constructed under a federal grant. As the Army developed newer and heavier aircraft, more durable runways were required. In October 1944, March Field planned a new runway which would parallel the older one. Construction began in 1945 and eventually cost \$1.5 million. When

⁶² Johnson, *Inventory and Evaluation of World War II Structures*.

Johnson, Inventory and Evaluation of World War II Structures.

Johnson, Inventory and Evaluation of World War II Structures.

Johnson, Inventory and Evaluation of World War II Structures.

⁶⁶ Johnson, *Inventory and Evaluation of World War II Structures*.

completed, the 7,000-foot runway boasted supporting aprons, taxiways, warm-up pads, and shoulders to accommodate the new B-24 and B-29 aircraft.⁶⁷

After two years of service as a tactical base, March Field's mission changed to that of pursuit or offensive operations. During World War II, March Field served many vital, if unspectacular, functions. It provided facilities for test aircraft, although none were actually developed on base. The Army Air Corps tested a prototype of the first twin-engine fighter at March Field on January 1, 1939. The XP-38 made several test flights, then departed on February 11th on a transcontinental hop. The plane crashed just short of the runway at Mitchell Field in New York, but it had shown enough promise for the Army to continue tests at another air field. Between August 6th and 23rd, 1939, tests on an Ercoupe engine proved the feasibility of jet-assisted takeoffs. In April 1942, liquid rockets were used to assist A-20 bombers into the air from Muroc Bombing Range. At the opposite end of the technical spectrum, the Army designated March Field as the replacement center for glider training in May 1942.

The mission of March Field became one of support for an aviation engineer training center during the greater part of 1943, changing once again in 1944 to a B-24 training base. It remained in this capacity for the remainder of the war.

After the war, March Field served as the base for inactivating bomber groups under the supervision of the 58th Bomb Wing. During this time, the base reverted to its former wartime role as an operational fighter base and functioned in this capacity until the early part of 1949 when the SAC assumed jurisdiction and March Field became a bomber base.⁶⁹

Cold War Era (1946-1991)

After World War II, March Field's role and importance faded briefly. However, as the Cold War intensified, the changing political climate caused the Defense Department to envision March Field as an important part of the domestic SAC. The 1995 *Historic Building Inventory and Evaluation: March Air Force* and 2013 *Cold War Cultural Resources Inventory and Evaluation, Update Report, March Air Reserve Base, Riverside County, California* address March AFB during the Cold War and discuss March Field's role in the SAC system between 1946 and 1992.

Tensions between the U.S. and the Soviet Union renewed a sense of urgency within the U.S. military shortly after World War II. The military, after only a few months of post-war contraction, underwent broad changes, affecting March Field and considerably changing its makeup. The National Security Act of 1947 created the USAF as a military branch and set up three commands placed under its authority. March Field was then renamed March AFB and was placed under the first of these, the Tactical Air Command (TAC), in 1948. Following a short period under Continental Air Command, March AFB was eventually placed under SAC jurisdiction on May 1, 1949, and remained a SAC base for 44 years.⁷⁰

SAC had been developed in 1946 as the nascent USAF's premier strike force command and served as the military's primary force in the prevention of atomic war. Prior to the development of intercontinental ballistic missiles (ICBMs), American nuclear capabilities were restricted to long-range bombers. Effectively, it was SAC that embodied American nuclear retaliation capabilities, commanding both bombers and later ICBMs. Through the Cold War, particularly in the late 1940s, 1950s, and early 1960s, SAC was entrusted with the primary responsibility of establishing the threat of "massive retaliation." This

-

⁶⁷ Johnson, *Inventory and Evaluation of World War II Structures*.

Johnson, *Inventory and Evaluation of World War II Structures*.

⁶⁹ Johnson, *Inventory and Evaluation of World War II Structures*.

⁷⁰ Manley, *Inventory and Evaluation*.

was seen as the foremost deterrent against nuclear attack on the U.S., more so than the nation's efforts to develop defensive tools, such as the early warning system, air defense system, and, later, the antiballistic missile.⁷¹

For the remainder of the Cold War, SAC defined March AFB's role in the nation's perceived Soviet threat. March AFB became home to the Fifteenth Air Force (15 AF) in November 1949. The 15 AF was SAC's first numbered air force and came to March AFB to hold SAC authority over the western U.S. The 22nd Bombardment Wing (22 BW) was assigned to the base a few months earlier and became the main combat unit at March AFB. The 15 AF also gained fighter and reconnaissance wings to complement its bombardment components. March AFB increased by 6,300 acres of government-owned land during this period, acquiring farmland to the south and east. The 15 AF remained at the base until 1993, and the 22 BW until 1994.

During the Korean War, SAC, along with other USAF Commands, was called upon to fight, and the 22 BW was mobilized for war in July 1950, shortly after returning from temporary duty in England. The 22 BW was sent to Okinawa, Japan, and within a few weeks was part of the newly created Far East Air Forces headed by 15 AF Commander General Emmett "Rosie" O'Donnell. Before the 22 BW returned to March AFB in October 1950, the wing conducted a total of 57 missions and 835 sorties. The wing grew to 30 aircraft and 30 combat crews by summer 1952 and trained other crews from the 44th and 106th Bombardment Groups, a service vital to the Korean War effort.⁷⁴

SAC itself underwent great changes in the early 1950s. Commander Curtis LeMay, in an attempt to make the command more battle ready, announced in early 1951 that all combat units were to be separate and independent of base services and operations. This reorganization allowed combat wings to move into action without administrative complications. The reorganization assigned an air division to each combat unit to handle the "housekeeping" duties on base. The 12th Air Division at March AFB was assigned to the 15 AF in February 1951 and exercised operational control over the 22 and 44 BWs.⁷⁵

In 1950, March AFB assumed another role: air refueling. The 22nd Air Refueling Squadron (22 AFRES) was activated under the 22 BW in June 1950, and immediately got under way with use of KB-29s, B-29s converted for refueling purposes. The squadron acquired the KC-97, designated specifically for air refueling, in June 1952.⁷⁶

During the Korean Conflict, individuals at March AFB worked to plan the future of the base in the face of rapid changes. General Jack Catton and General Howell Estes, both from the 12th Air Division, began a campaign to convince USAF superiors that March AFB should serve as a jet bomber base. The new B-47 bombers represented a technological advance from the propeller-driven B-29s of World War II. General Estes and Catton knew that changes would have to be made at March AFB to handle these more sophisticated bombers.⁷⁷

Substantial expansion of the March AFB flightline was initiated in November 1952. The most important projects were the expansion of the flightline and lengthening of the main runway to 10,000 feet. A total of 600 acres south of the base were acquired for this lengthening project, and buildings located at the south

⁷¹ JRP, Cold War Cultural Resources Inventory and Evaluation.

Manley, Inventory and Evaluation.

⁷³ JRP, Cold War Cultural Resources Inventory and Evaluation.

Manley, *Inventory and Evaluation*.

⁷⁵ Manley, *Inventory and Evaluation*.

Manley, *Inventory and Evaluation*.

⁷⁷ Manley, *Inventory and Evaluation*.

boundary of the base were moved to West March to make room. The \$6-million contract went to Peter Kiewit Company of Arcadia, who had worked on March Field's runway in 1944. The new runway was three feet thick and ran parallel to the old one. The runway's length and thickness allowed it to handle any USAF plane in existence or in planning stages and was designed to handle aircraft in the years to come. ⁷⁸

In addition to the runway construction, March AFB acquired over \$15 million from the Marshall Appropriation in Congress. This money was used to build a new hospital, administration buildings, maintenance buildings, housing units, and a munitions storage area. While a significant portion of this new construction took place adjacent to the flightline and in the historic core of the base, a number of projects took place in the western area of the base known as West March, on the site of the World War II era anti-aircraft artillery training area known as Camp Haan. Most notably, construction in this area included a large housing area named Arnold Heights, in honor of General Arnold (which is no longer extant or part of base property). A series of eight "skydocks" were also renovated to handle the shift to KC-97s during this time. So

Improvements undertaken at March AFB during this period reflected a standardized design that reflected the larger SAC program rather than any particular mandates of March AFB itself. Air Force "Definitive Designs" were used for virtually all new construction, including hangars, administration buildings, and other operational construction. Across all SAC bases, the Air Force Architectural Services Branch developed standardized projections for specific facilities association with operational groups, thereby creating a uniform design language across SAC bases. Within this standardized context, the Air Force did often employ local architectural firms, however, almost all of the plans were adapted from this core set of Definitive Designs and, as such, SAC related construction at March AFB mirrored that which was occurring at other SAC bases across the country.⁸¹

In January 1953, March AFB (through the 22 BW) became one of the first 15 AF bases to convert from B-29s to B-47s to facilitate combat readiness. The culmination of the new aircraft programs came in February 1953, when one of the 22 BW's KC-97 successfully refueled a B-47 flown by Major Chuck Yeager. By the early 1950s, March AFB no longer had fighter aircraft, having become purely a bomber base. By 1954, the additional support facilities for the B-47 and KC-97 aircraft were completed. By 1954, the additional support facilities for the B-47 and KC-97 aircraft were completed.

March AFB continued in the late 1950s to fulfill a variety of missions for the USAF. Numerous specialized squadrons operated out of March AFB, giving the base a broad spectrum of expertise. The 6983rd Radar Squadron operated at the base, possibly controlling early warning radar stations at remote locations in California. An Altitude Training Unit (pressurized chamber) was also operational at March AFB during this period. The pressure chamber was designed to reconstruct conditions when flying at high altitudes. The March Radar Field Maintenance Section of the 15 AF tested radar antenna equipment and developed them for use by all SAC bases.⁸⁴

March AFB continued its role in training through the Cold War, especially in the 1950s. The 44 BW was reactivated at March AFB in January 1951 (after demobilization in 1946) and assigned a training role. By the end of the month, the 44 BW contained 60 officers and 400 airmen drawn from other units (such as the

⁷⁸ Manley, *Inventory and Evaluation*.

JRP, Cold War Cultural Resources Inventory and Evaluation.

Manley, Inventory and Evaluation.

⁸¹ JRP, Cold War Cultural Resources Inventory and Evaluation.

⁸² Manley, *Inventory and Evaluation*.

⁸³ Manley, *Inventory and Evaluation*.

⁸⁴ Manley, *Inventory and Evaluation*.

22 BW). Not under SAC control, the 44 BW was not required to undergo operational readiness testing, and focused solely on training. Although the 44 BW left March AFB in August 1951, other units continued the training mission through the 1950s. Throughout its various programs, the training of refueling crews was a major task of the 22 AFRES. A special trainer was established at March AFB for use in the maintenance of the B-47 navigation system. The "MAC-2 Trainer" served as a simulator for bomb navigation, training many in accurate bombing. ⁸⁵

By 1955, the 15 AF at March AFB oversaw 10 bases throughout the west. Later, this control included ICBMs. The 15 AF received command of its first Atlas missile in October 1959 at F.E. Warren AFB, Wyoming. A special squadron was established for this new responsibility. The 564th Strategic Missile Squadron became operational in September 1960 at F.E. Warren AFB and was given the task of firing the Atlas missile should the need arise. By the next year, six such squadrons existed; by late 1961, 15 AF held jurisdiction over 75 percent of SAC's ICBMs throughout the western U.S. With these ICBMs, all located changes in manpower and headquarters occurred throughout the 15 AF.

The alert responsibility continued for years at March AFB and remained a priority. To minimize the time needed for the alert crews to reach their planes on the flightline, an alert facility, or "crew readiness" building, was completed in January 1960. This alert facility was adjacent to the flightline and the SAC bombers. It was designed to house 96 men, allowing them to live and work next to their planes. In 1961, the 22 BW increased its alert posture from 33 percent to 50 percent.⁸⁷

March AFB alert crews were called upon during the Cuban Missile Crisis of 1962. The 22 BW was ordered to an advanced posture of alert on October 22nd, after President Kennedy's quarantine of Cuba. The commanding officer of the 22 BW ordered all training canceled and prepared all units for combat. Tensions were high on base, particularly among alert crews, until a "relaxed state" was reached when the crisis was averted a few weeks later. March AFB alert crews were prepared to carry out SAC policy of both nuclear retaliation and deterrence to communist moves throughout the globe. With the change to 50 percent alert status, the remaining 50 percent of the crew not on alert duty remained in constant training. The non-alert portion of the 22 BW at March AFB was assigned to test a new SAC maintenance plan. Project "High Blower" was designed to cut SAC maintenance time by half, bringing mechanics out to the plane and commencing work immediately. 88

Throughout the late 1950s and early 1960s, the 15 AF played a major role in development and management of SAC's ICBM force. By the close of 1963, the 15 AF had jurisdiction over all but one missile unit in the west, and commanded 600 Atlas, Titan, and Minuteman ICBMs. The first 15 AF Minuteman missile was accepted in 1963, giving an effective mix of missiles and planes.⁸⁹

In March 1963, March AFB received its first B-52 bombers to replace the outdated B-47s. The B-52s marked a change in the role of the 22 BW to that of heavy bombardment. In line with the changeover to the B-52, March AFB KC-97s were replaced by the KC-135 tanker, giving the base an all-jet force. In September 1963, a new 24-hour alert posture was initiated with these new bombers. In addition, March AFB crews began to perform alert duty at other installations.⁹⁰

⁸⁵ Manley, Inventory and Evaluation.

Manley, *Inventory and Evaluation*.

Manley, *Inventory and Evaluation*.

⁸⁸ Manley, *Inventory and Evaluation*.

⁸⁹ Manley, *Inventory and Evaluation*.

⁹⁰ Manley, *Inventory and Evaluation*.

Once again, new aircraft at March AFB sparked a massive construction program, surpassing that of the B-47 buildup. A total of \$11 million was spent in the buildup between 1963-1968 including the construction of enlisted dormitories, a child care facility, a squadron operations building, the Combat Operations Center, a new hospital, water storage tanks, and various warehouses. Facilities also constructed during this five-year period to directly support the B-52s included aircraft maintenance lighting and docks, an engine inspection and repair shop, and a maintenance control facility, as well as blast deflector fences, four new parking aprons, and fuel cell dock at the south end of the runway for the repair of B-52 fuel systems. In addition, the runway, taxiways, and overways were again strengthened. This array of construction supported a surge in population at the base, which by the mid-1960s was at 9,000, the highest since World War II.

While massive construction programs were underway, March AFB became involved in conflict overseas, contributing units to the Vietnam war effort. Between 1967-1972, most units at the base were sent to Southeast Asia, leaving only caretaker and support elements to run the base. The presence of the HQ 15 AF at the base also meant that much of the planning for deployment of SAC forces to Southeast Asia occurred at March AFB, particularly in the field of air refueling. The air refueling deployment operation was moved from Castle AFB to March AFB in January 1972 and all tankers destined for Southeast Asia were staged through March AFB until December 1975. KC-135s from March AFB also participated in the refueling of TAC and Military Airlift Command aircraft destined for Southeast Asia. 93

By late 1973, the majority of crews from March AFB returned to the U.S. to resume their roles in the ground-alert missions. Despite shrinking budgets, construction and base improvements continued in the early 1970s, as World War II temporary structures became increasingly insufficient. Most of these wartime structures were demolished, and many other buildings were refurbished for modern usage. Base construction in this era attempted to continue General Arnold's ideal of making the base an architectural showplace. Much of the new construction was designed to complement the older Mission-style architecture; the basic outline of the base remained in place even with this new construction. The center of the base continued to focus on the original triangular area of housing and administration buildings that dated back to the late 1920s and 1930s. The flightline existed, as it had since construction, at the hypotenuse of this triangle, with support facilities arranged alongside it.

The hospital at March AFB, constructed in 1965, was selected to receive and care for many of the prisoners of war (POWs) returning from Southeast Asia in 1973 during Operation Homecoming. An entire wing was set aside for these returning POWs, who received a variety of medical, psychiatric, and spiritual services. The hospital was the first stop for these POWs, and every effort was made to smooth the transition to regular life for these men. Family members were transported to the hospital at government expense, and full medical evaluations were performed. A total of 54 POWs were processed through the hospital in 1973. A new wing was also constructed in 1974 to accommodate the increasing number of retirees settling in the immediate area.⁹⁵

The 1970s witnessed continued changes for March AFB, with many cutbacks in expenditures and personnel. The number of base personnel was reduced by 20 percent in the early 1970s, initiating a move to place deterrent forces inland away from coastal areas. The move was designed to increase response time

Manley, *Inventory and Evaluation*.

⁹² JRP, Cold War Cultural Resources Inventory and Evaluation.

⁹³ Manley, *Inventory and Evaluation*.

Manley, *Inventory and Evaluation*.

⁹⁵ Manley, *Inventory and Evaluation*.

of strategic forces in the event of an attack. Despite these reductions, March AFB continued to set records. In April 1975, crews again performed another first by refueling a B-1B in the air with a KC-135 tanker, and in May, a Navy F-14. 96

With increased defense spending under the Reagan Administration, March AFB transformed again. In 1982, the 22 BW was renamed the 22 Air Refueling Wing (22 ARW), ending an era of bombardment missions at March AFB. March AFB's B-52s were replaced by new KC-10 tankers, a military version of the DC-10. With the conversion to the KC-10, March AFB lost nearly 430 military and 10 civilian positions. Later in 1982, the number of KC-10s was increased at March AFB, due to realized shortages in air refueling capabilities illustrated by a crisis in the Middle East.

In 1982, March AFB gained an ANG unit, the 163rd Tactical Reconnaissance Group, which required a total of \$15 million in construction programs to support it. The 163rd, previously a Tactical Air Support Group, flew RF-4s, the unarmed reconnaissance version of the F-4 Phantom II. By 1993, the 163rd changed again, this time to the 163rd Air Refueling Group, flying KC-135Es.⁹⁷

Post-Cold War Era (1992-Present)

With the end of the Cold War, SAC was disestablished in 1992 and March AFB came under the command of the newly established AMC. The 22 ARW was transferred, in name only, to McConnell AFB, Kansas. 22 ARW aircraft and personnel were assigned to the newly established 722nd Air Refueling Wing (722 ARW). Following the conversion of March AFB from an active duty base to a reserve base, the 722 ARW was disestablished. The HQ 15 AF, also assigned to AMC, was relocated to Travis AFB, California in 1993.⁹⁸

In 1993, March AFB was selected for realignment by the BRAC program, and on April 1, 1996, March AFB was officially re-designated March ARB under the AFRC. As part of the realignment, the base was decreased in size to approximately one-third of its peak acreage with the surplus property transferred to the MJPA. The MJPA was established in 1993 for planning and implementing new uses for the excess land, the reuse of existing buildings and facilities, and the joint use of the airfield for the development of an air cargo facility. March ARB continues to serve a critical air support mission with the 452 AMW Operations, Maintenance, Mission Support, and Medical groups. The 452 is the AFRC's largest AMW. The base also serves as a joint-use installation and is home to tenant units from the Army Reserve, Navy Reserve, Marine Corps Reserve, ANG, and the Department of Homeland Security.

8.3 Resource Inventories

Cultural resources inventories are key tools in the identification and protection of existing cultural resources. The following resources inventories are maintained, as necessary, by the installation:

- Archaeological sites (no known archaeological sites are located within the base boundaries)
- Buildings and structures
- TCPs and sacred sites (no known TCPs and sacred sites are located within the base boundaries)
- Cultural landscapes (no known cultural landscapes are located within the base boundaries)

Manley, *Inventory and Evaluation*.

Manley, *Inventory and Evaluation*.

⁹⁸ Manley, *Inventory and Evaluation*.

https://marchjpa.com/about.php.

The inventory tables for buildings and structures are maintained in Microsoft Excel format and are included in Appendix B to this Plan.

Installation Supplement – Resource Inventories

Archaeological Resources

All areas of the former and current installation have been surveyed for surface archaeological resources, and are detailed in the table provided below, arranged by report number. As part of the 2011 ICRMP, the California Historical Resources Information System (CHRIS) conducted a records search of previously recorded cultural resources and previously conducted archaeological investigations for March ARB. This search, together with information reported in the 2004 ICRMP and the ASM Affiliates 1996 report, as well as March ARB records, identified 57 archaeological investigations within the search area, which included the current boundaries of March ARB, areas located west of the current base boundaries (which were previously part of the base), and a 500-foot search radius buffer. Six of these archaeological investigations include portions of the current March ARB boundaries. No archaeological resources were identified within the March ARB boundaries as a result of the surveys. One archaeological isolate, a historic-period glass fragment, is located within the airfield; however, it has not been recorded and remains in place. As such, no NRHP-listed, -eligible, or potentially eligible archaeological resources have been identified within the current boundaries of the installation.

Summary of Archaeological Studies

Author and Years	Report No.	Total Acres Surveyed	Resources Recorded	Within Current March ARB Boundaries?
Drover 1986	MF-0021	23	None	No
McCarthy 1986	MF-2237	134	Six bedrock milling sites	No
Swope and Neiditch 1987	MF-2313	970	18 bedrock milling sites, one historic-era site, four isolated artifacts	No
Drover 1987	MF-2346	153	Five bedrock milling sites	No
Drover 1989	MF-3755	25	None	No
Clough 1974	RI-0130	2,000	2 (type not specified)	Yes
King et al. 1974	RI-0133	None	None	No
O'Conell et al. 1974	RI-0137	2,400	10 (type not specified)	No
Greenwood 1975	RI-0161	N/A	N/A (overview only)	No
Leonard and Belligio 1977	RI-0250	320	6 (type not specified	No
Lando 1978	RI-0422	150	9 (type not specified)	No
Bean et al. 1979	RI-0535	403,203	16 (type not specified)	No
Spanne 1986	RI-0583	32	None	No
Van Horn 1980	RI-1144	1,500	21 (type not specified)	No

Summary of Archaeological Studies

Author and Years	Report No.	Total Acres Surveyed	Resources Recorded	Within Current March ARB Boundaries?
Hammond 1982	RI-1410	3.6	None	No
Bouscaren 1983	RI-1717	637	31 (type not specified)	No
Swope 1987	RI-2125	970	19 (type not specified)	No
Drover 1987	RI-2159	153	5 (type not specified)	No
McCarthy 1987	RI-2171	680	65 (type not specified)	Yes
Drover 1988	RI-2293	2	1 (type not specified)	No
Brewer 1991	RI-3186	20	None	No
Tetra Tech, Inc. 1990	RI-3243	834	5 (type not specified)	Yes
Torres 1991	RI-3298	2.5	None	No
Drover 1992	RI-3465	800	None	No
Budinger 1990	MF-3475	834	Three bedrock milling sites, one isolated artifact	Yes
Drover 1989	RI-3494	50	None	No
Taskiran 1992	RI-3505	2	None	No
ASM Affiliates (McDonald and Giacomini) 1996	RI-3510	2,500	60 bedrock milling sites, five historic-era sites, three isolated artifacts	Yes
Bupp 1993	RI-3692	1.3	1 (type not specified)	No
Foster et al. 1991	RI-3693	951	10 (type not specified)	No
White 1993	RI-3704	46.2	None	No
Keller 1994	RI-3797	245.6	40 (type not specified)	No
Hogan et al. 2004	RI-4766	275	13 (type not specified)	No
Irish 1997	RI-4858	520	17 (type not specified)	No
McKenna et al. 2001	RI-4996	None (review only)	6 (type not specified)	No
McKenna et al. 2002	RI-5055	None	None (literature review only)	No
LSA Associates 2003	RI-5179	20	None	No
Mason 2005	RI-5458	10	None	No
Dahdul et al. 2003	RI-5994	None (excavation)	2 (type not specified)	No
Bricker 1998	RI-6088	None	30 (type not specified)	No

Summary of Archaeological Studies

Author and Years	Report No.	Total Acres Surveyed	Resources Recorded	Within Current March ARB Boundaries?
Mason 2005	RI-6276	2.4	1 (type not specified)	No
Tang et al. 2006	RI-6660	54	None	No
Jordan 2007	RI-6718	11	1 (type not specified)	No
McKenna 2006	RI-6780	2.5	None	Yes
Alexandrowicz 2006	RI-6845	2.1	None	No
Jordan 2007	RI-7063	1	None	No
Jordan 2007	RI-7068	16.8	1 (type not specified)	No
Bonner and Aislin-Kay 2006	RI-7323	0.3	None	No
McGinnis 2007	RI-7568	None	None	No
Tibbett and Bell 2007	RI-7817	None	None	No
Jordan and Moreno 2007	RI-8169	2.8	None	No
Schultze and Cook 1996	RI-8231	74	3 (type not specified)	No
Bonner and Williams 2009	RI-8307	None	None	No
Said and Bonner 2009	RI-8309	0.2	None	No
McKenna 2008	RI-8367	200	6 (type not specified)	No
Mermilliod 2008	RI-8398	0.1	1 (type not specified)	No
Pollack 2007	RI-8433	None	None	No

Sources: ASM Affiliates 1996; et al. 1999; CHRIS Eastern Information Center 2010; JRP 1996; March ARB 2004 ICRMP; March ARB 2011 ICRMP. "MI" report numbers are from ASM Affiliates 1996; "RI" report numbers are from CHRIS Eastern Information Center 2010.

Determination of Eligibility and SHPO Concurrence

The PA between the USAF and the SHPO regarding the disposal of portions of March ARB notes that "the Air Force, in consultation with the California State Historic Preservation Officer and Regional Native American Tribes, has conducted archaeological surveys and ethnographic and ethnohistoric studies to determine the presence of National Register-listed or -eligible prehistoric or historic archaeological resources or TCPs within the boundary of March AFB [which includes the current March ARB] and has determined that the entirety of the base is devoid of these types of historic properties and the California SHPO has concurred" (see Appendix E).

Measures Taken to Mitigate Adverse Effects

Because no NRHP-eligible or -listed archaeological resources have previously been identified at March ARB, there have been no mitigation measures implemented to reduce or resolve adverse effects to significant archaeological resources.

Section 7.4 includes procedures to ensure protection of any newly discovered archaeological resources.

Architectural History Resources

March ARB has been fully surveyed for architectural history resources by a number of cultural resources studies, including a full inventory and evaluation of March ARB completed as part of this ICRMP. As discussed in previous sections, the MFHD is the only historic property previously identified as a result of the past surveys completed within the current March ARB boundaries. The surveys completed for this ICRMP identified Building 413 as being individually eligible for listing in the NRHP. The following provides a summary of the previously conducted architectural history surveys and the current survey completed as part of this ICRMP.

Previously Conducted Architectural History Surveys

Previously conducted surveys at March ARB have studied and evaluated architectural history at the base through the lens of several historic contexts. A *Preliminary Historical Inventory* was completed by the firm Fields & Silverman Architects in 1985, which resulted in the recommendation that the buildings and structures in the March Field portion of the installation be nominated to the NRHP (the area bounded by Meyer and Riverside Drives, and Graeber Street). Subsequently, in 1992, the *National Register of Historic Places Registration Form for March Field Historic District* was prepared. JRP later amended the form in 2012. The district presently includes 195 contributing resources, only 68 of which remain on property owned by March ARB. This ICRMP Update recommends adding Structure 450 as a non-contributing resource to the district and expanding existing MFHD boundaries to include Building 2304 as a contributing resource (described in more detail in later in this section). If Structure 450 and Building 2304 are added to the MFHD, the district would include 212 resources, of which 196 would be contributing. This would include 69 contributing resources and 13 non-contributing resources within the boundaries of March ARB.

The MFHD was nominated and listed in the NRHP in 1994 at the state level of significance under Criterion A for its significance in the areas of military history and under Criterion C for its architectural significance (#94001420). The period of significance of the district was 1928-1943, the period during which the buildings were constructed and generally laid out according to the 1928 master plan for the base. Under Criterion A, the district is a significant representative of California's military history through its association with the development of the Air Corps. Under Criterion C, March Field is a distinguished example of a military base laid out according to prevalent city planning principles of the 1920s. In addition, the district is an important example of the work of architect Myron Hunt, being the only known military base designed by him. Lastly, March Field represents an extraordinarily large assemblage of buildings constructed using hollow wall concrete construction methods, illustrating the range of applications for that technology better than any other property in California. The 1994 NRHP nomination included 199 contributing resources and 29 non-contributing resources.

The next major architectural history survey conducted at March ARB was a 1991 inventory and evaluation of World War II era buildings and structures undertaken by the U.S. Army Corps of Engineers, Sacramento District, *Inventory and Evaluation of World War II Structures March Air Force Base, Riverside, California*. This study was completed to partially fulfill NHPA requirements. The report concluded that there was only

one NRHP-eligible historic property from the World War II era, the Red Cross building and associated garage (Building 641), located between Riverside Drive and Third Street. Following the 1996 realignment process, the Red Cross building is no longer within March ARB boundaries. The remaining World War II era resources studied in 1991 that are within the current boundary of March ARB were found not eligible for listing in the NRHP. Information related to SHPO concurrence with the findings of the report were not available from March ARB.

In 1995, a Cold War-era study, *Historic Building Inventory and Evaluation*, was prepared by William Manley Consulting. The study evaluated for NRHP eligibility all Cold War era (1946-1989) buildings and structures at the base for compliance with Section 106 of the NHPA and NEPA related to the realignment of the base Since the buildings were not yet 50 years of age, the study employed NRHP Criterion Consideration G, which necessitates properties constructed less than 50 years ago be of exceptional importance in order to be eligible for inclusion in the NRHP. Under this framework, the study identified one NRHP-eligible historic property: Building 2605, the Combat Operations Center, located north of Meyer Drive between Riverside Drive and Fourth Street. SHPO concurred with this finding. Following the 1996 realignment process, the Combat Operations Center is no longer within the boundaries of March ARB.

In 2012, the NRHP nomination was amended by Polly Allen of JRP. Updates included the removal of two contributing buildings and 15 non-contributing buildings and structures from the district. One non-contributing building constructed in 1993 also was added to the district. The update also records a change in the ownership of a portion of the district that was transferred from March ARB to MJPA following the 1996 realignment. District boundaries were not changed in the 2012 amendment; as such, the MFHD reflects its original 1992 boundaries. The amendment included 197 contributing resources and 15 non-contributing resources. Of these, 70 contributing resources and 12 non-contributing resources were located within the boundaries of the base. In 2017, two contributing resources, Buildings 385 and 441, were demolished, thus bringing the total number of contributing resources to 195, including 68 on March ARB property.

In 2013, JRP completed an update to Manley's 1995 Cold War era resources study. This update, *Cold War Cultural Resources Inventory and Evaluation, Update Report, March Air Reserve Base, Riverside County, California,* inventoried and evaluated Cold War era resources constructed at March ARB between 1946 and 1968. None of the resources were determined to possess the significance necessary for listing in the NRHP.

Current Architectural History Survey Methods

In November 2018, a field survey, coupled with additional historic research, was completed as part of this ICRMP. The survey included the identification and evaluation of architectural history resources (comprised of buildings, structures, objects landscape elements, and districts) located within the current March ARB boundaries. In addition, architectural history resources located outside the main boundaries of the base, such as Buildings 758, 6005, and 6006, were included as part of the field survey. The field survey was completed IAW the *Secretary of the Interior's Standards for Historical Documentation* and the OHP's Instructions for Recording Historical Resources.

The field survey focused on architectural history resources constructed more than 45 years ago (i.e., pre-1974), and occurred between November 26, 2018 and November 30, 2018. Dates of construction for the resources were primarily provided by the USAF; however, in several instances, there were discrepancies between the dates provided by the USAF, the past studies completed at the base, and historic research completed for this current assessment.

The objectives of the field survey were to:

- Re-validate findings of the 1992 MFHD NRHP nomination and 2012 amendment through reanalysis
 of the historic district's period of significance, boundaries, applicable criteria, and contributing and
 non-contributing resources
- Consider resources within the MFHD that may also be individually eligible for inclusion in the NRHP
- Re-validate the 2012 Cold War Era historical evaluations
- Identify and evaluate previously unevaluated resources constructed more than 45 years ago or resources that appear to be exceptionally important

When warranted, the appropriate NRHP Criterion Considerations were used during evaluation, including Criterion Consideration F for commemorative properties and Criterion Consideration G for properties constructed within the past 50 years.

Field notes and digital photographs were taken for each of the resources. In addition, overview photographs were taken of March ARB, in order to accurately assess the overall setting, feeling, historic narrative, and context of the installation and specific areas. Within the restricted access areas of the airfield, investigators were escorted by March ARB personnel.

Supplemental research for the resources was conducted between November 2018 and February 2019 at the March Field Air Museum (including discussions with knowledgeable individuals), National Archives at Riverside, University of California, Davis Shields Library, University of California, Riverside Special Collections and University Archives, March ARB collections and records, and Moreno Valley Historical Society.

Current Architectural History Survey Results

In total, 175 previously recorded and unrecorded architectural history resources were identified and evaluated (see Appendix B of this ICRMP). Of the 175 resources, 48 have not been previously evaluated, and are primarily Cold War era resources that are less than 50 years of age. Volume II of this ICRMP contains DPR 523 Series Forms for each of the surveyed resources. IAW the *Secretary of the Interior's Standards for Historical Documentation* and the California OHP's Instructions for Recording Historical Resources, resources were grouped together based on historic function, use, or location. The following provides a summary of the survey findings.

The field survey completed an updated analysis of the MFHD within the boundaries of March ARB and recommends several modifications to the historic district's contributing and non-contributing resources, based on current conditions and historic research. One previously determined contributing resource (Structure 488) is recommended as a non-contributing resource. Structure 488 was a flagpole from 1933 located at the southwest corner of the parade ground; however, it has been removed and the only extant resource in this location is a memorial constructed in the 1970s that does not contribute to the significance of the historic district. In addition, Building 410 was previously identified in the NRHP nomination as a non-contributing resource to the historic district. The NRHP nomination stated the resource was constructed in 1947 as a well house; therefore, it was built outside of the district's period of significance and considered a non-contributing resource. However, supplemental research completed for this ICRMP identified 1927 as the date of construction; therefore, Building 410 is recommended as a contributing resource to the historic district.

In addition, this ICRMP Update recommends Structure 450 be added to the historic district as a non-contributing resource, and Building 2304 added as a contributing resource. If these resources are added to the MFHD, the district would include 212 resources, including 196 contributing resources. This would include 69 contributing resources and 13 non-contributing resources within the boundaries of the base.

Structure 450 is a beacon light constructed in 1949. The structure is located within the MFHD boundaries and is mounted to the top of Structure 407, a water tower that is an existing contributing resource to the district. Because Structure 450 was built after the district's 1928-1943 period of significance, it is recommended as a non-contributing resource to the MFHD.

Building 2304 is a gatehouse located outside but immediately west of the northern boundaries of the MFHD on the west side of Graeber Street. The 2011 ICRMP suggests that the gatehouse likely was moved to its current location and assigned its current building number during the 1950s or 1960s; however, review of historic photographs and aerials indicates that the building was at its present location by 1933. Based on 452nd MSG/Civil Engineers records, the gatehouse was built in 1929, and a placard outside the building identifies that it was built in 1927. The gatehouse is not visible in aerials from 1929 or 1932, but is present in a 1933 aerial image. Therefore, based on primary source evidence, the building existed by 1933. No other primary source documentation was uncovered indicating that the gatehouse was built prior to 1933. Building 2304 was built within the MFHD's period of significance and is associated with the base's interwar period development, historic themes, and architectural character. Therefore, the historic district boundaries should be expanded to encompass the gatehouse, which should be added as a contributing resource to the MFHD. The boundary expansion area is depicted in Figure 2, and encompasses the gatehouse as well as the gate attached to its west elevation, which was built contemporaneously with the gatehouse. The boundary expansion area extends northwest from the northern boundary of the MFHD on Graeber Street, then turns to the southwest to parallel the northwest side of the sidewalk that leads to the northwest elevation of Building 2271. To the south of the gatehouse, the boundary turns northwest to parallel the northeast side of the sidewalk. At the western pillar of the gate attached to the gatehouse, the boundary turns northeast until it meets with Graeber Street, then continue to the southeast along Meyer Drive to rejoin with the existing district boundaries.

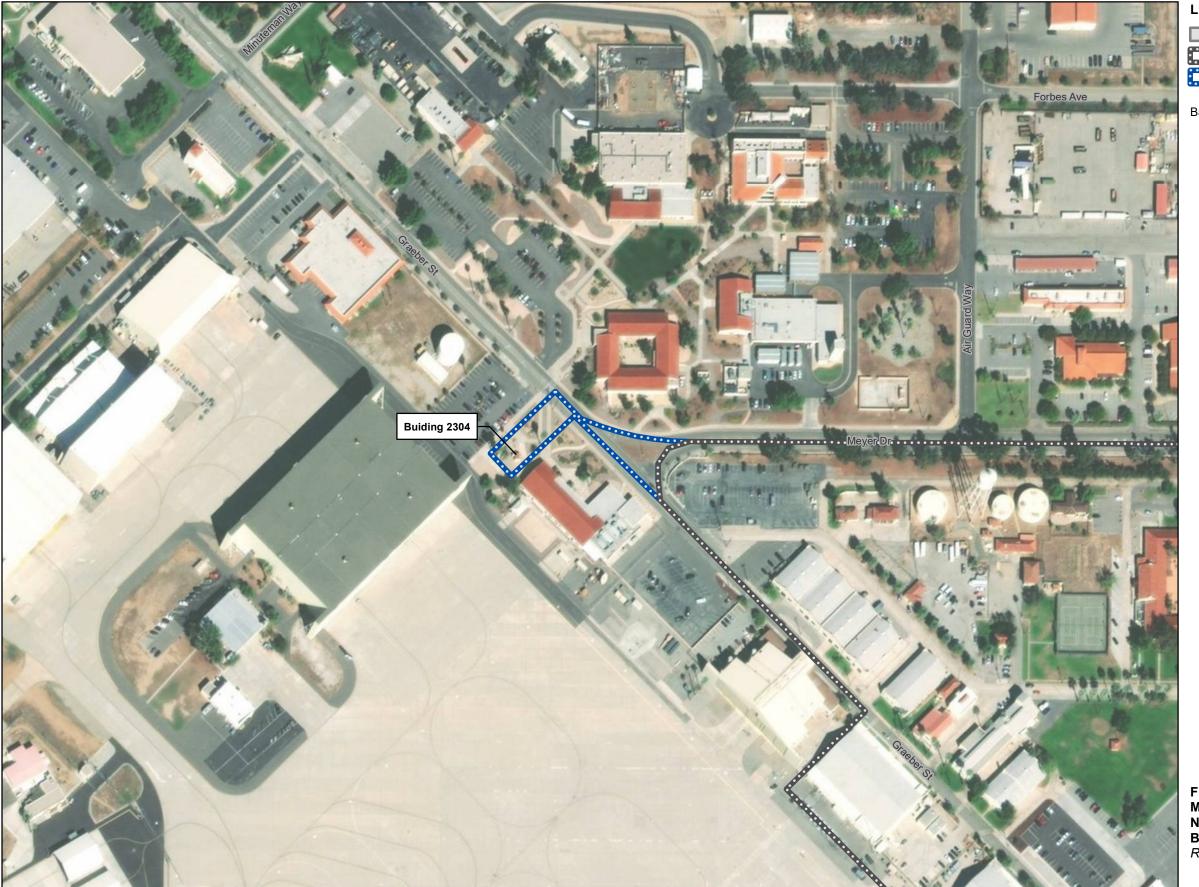
The updated evaluation of the MFHD analysis also identified several landscape and streetscape elements within the district boundaries as character-defining features for several of the contributing resources to the district. Based on historic photographs and context information, most of the landscape and streetscape features were added to the district by the 1930s, including the large manicured grass lawns and mature palm trees lining major arterial roadways or building envelopes. Historic manholes and light standards also are included as streetscape elements. These features are linked to the district's sense of place, feeling, character, and visual appearance.

Outside the aforementioned changes to contributing and non-contributing resources, the recommendation to include Structure 450 as a non-contributing resource, and the proposed historic district boundary expansion area to include Building 2304 as a contributing resource, no other changes are recommended, including to the MFHD's applicable NRHP criteria or period of significance. While some contributing resources pre-date the period of significance (such as Buildings 410, 413, and 2304), they achieved importance during the period of significance. Therefore, no modifications are recommended for the period of significance.

One resource within the MFHD, Building 413, is recommended as individually eligible for listing in the NRHP under Criterion A, in addition to being a contributing resource to the MFHD. The building was originally constructed in 1917 as a bakery and has also been used a servants' quarters and bath house. It is

the oldest extant building at the base. Due to its association with the base's World War I era history, Building 413 is recommended as individually eligible for the NRHP.

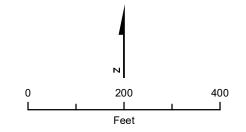
No resources that date from the Cold War era or that were previously unevaluated were identified as individually eligible for listing in the NRHP. These resources do not convey the importance of any significant themes, possess distinctive architecture, or have a direct or significant association with important individuals or events. Resources from the Cold War era typically had standardized designs (based on their function), and alterations and improvements generally have impacted the resources' integrity of design, materials, workmanship, or feeling. Appendix B summarizes the results of the current field surveys completed for this ICRMP.



March Air Reserve Base Boundary

March Field Historic District Boundary

March Field Historic District Boundary Expansion



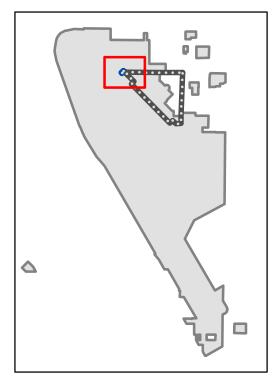


Figure 2 March Air Reserve Base ICRMP Update, November 2019, March Field Historic District Boundary Expansion Map Riverside County, California



Figure 3 depicts the location of the evaluated resources. Of note, several of the small-scale infrastructure elements, like the fences, various parking areas, curbs, and gutters are not depicted on Figure 3 as they are located throughout the entirety of the base. A map received by the contractor from March ARB showed Tyson Field outside the boundaries of MARB, which is an error, and has been corrected in Figure 3.

Records Consultation with SHPO

March ARB will forward documentation related to inventory and evaluation efforts conducted at the base to SHPO and the CHRIS in a timely manner in order to ensure compliance with all regulatory requirements presented in AFI 32-7065. As part of compliance with Sections 306108 and 306101-306114 of the NHPA, March ARB provides SHPO with determinations of eligibility and effects to identified and evaluated resources.

Measures Taken to Mitigate Adverse Effects

Under Section 306108 of the NHPA, March ARB must take into account the effect that an undertaking may have on any historic property included in or eligible for inclusion in the NRHP and afford the ACHP, SHPO, tribal groups, and other interested parties a reasonable opportunity to comment on such undertakings. The Section 306108 consultation process requires federal agencies to identify historic properties potentially affected by an undertaking, assess its effects, and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties. Adverse effects occur when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for listing in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

The CRM at March ARB initiates consultation under the Section 306108 process when there is an undertaking that may have an adverse effect on a historic property. If analysis under the consultation process results in a finding of adverse effect, March ARB continues consultation to avoid, minimize, or mitigate the adverse effects until they are resolved, which is executed through an MOA.

Per the Routine Maintenance PA, most maintenance activities completed within the MFHD are exempt from consultation under NHPA Section 306108 if the maintenance activities adhere to the guidelines and treatment techniques of the Maintenance Manual. Any type of maintenance activity completed following the guidance of the Maintenance Manual would be completed IAW the *Secretary of the Interior's Standards for the Treatment of Historic Properties* and would mitigate or avoid any adverse effects to the historic district. See Appendixes E and K for copies of the Routine Maintenance PA and Maintenance Manual.

Section 7.2 includes further information regarding this process.

Traditional Cultural Properties

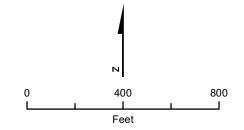
TCPs refer to resources associated with the beliefs, customs, and practices of a living community of people that have been passed down through the generations, usually orally or through practice. The significance of the resource is derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. These resources include cultural practices or beliefs of a living community that are important to the community's history and maintaining the continuing cultural identity of the community.



March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- △ Not Individually Eligible



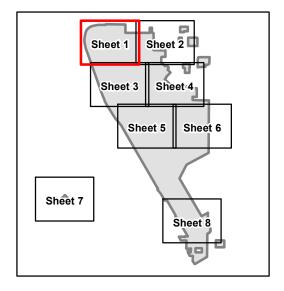


Figure 3
Sheet 1 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

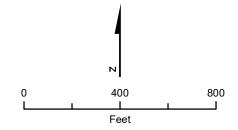




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- △ Not Individually Eligible



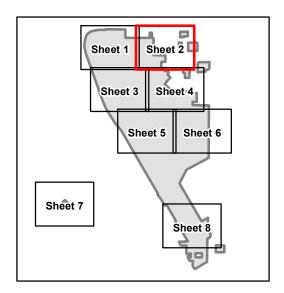
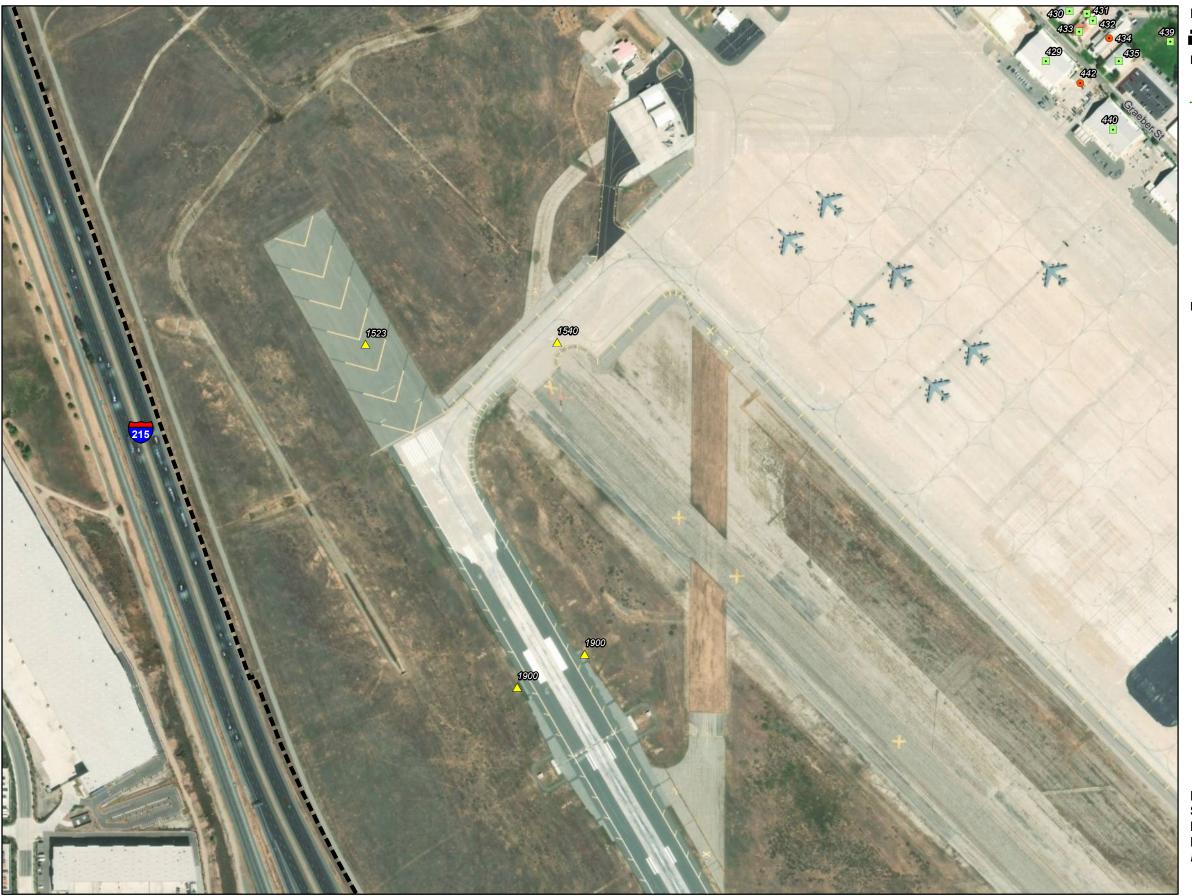


Figure 3
Sheet 2 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

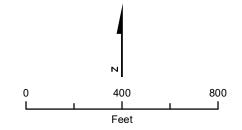




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



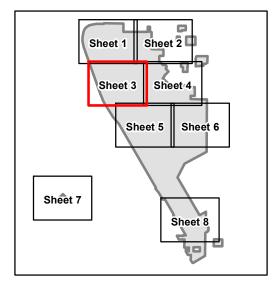
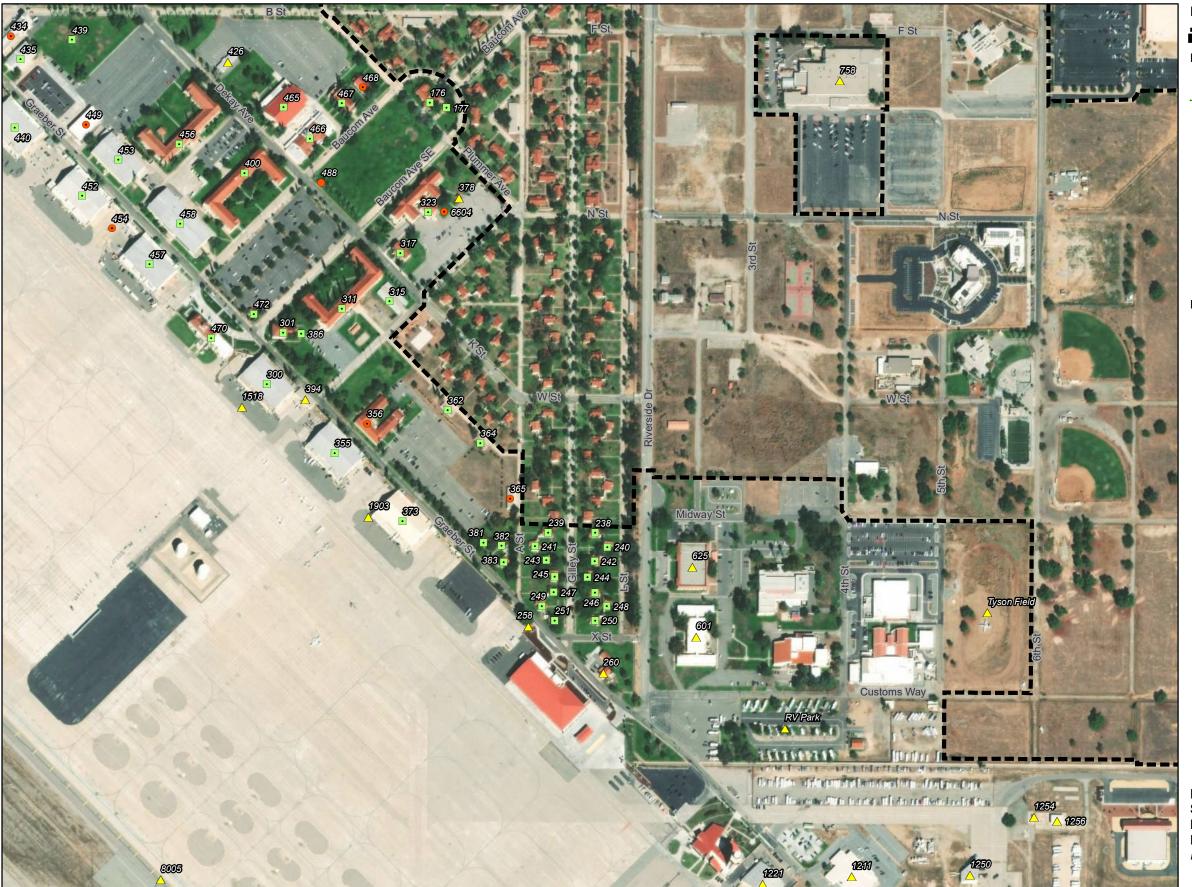


Figure 3
Sheet 3 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

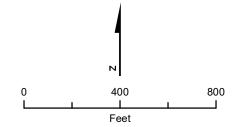




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



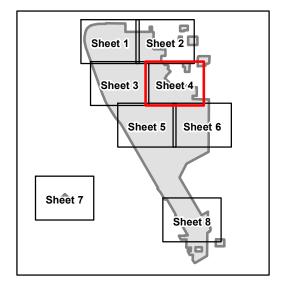


Figure 3
Sheet 4 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

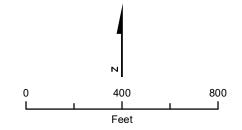




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



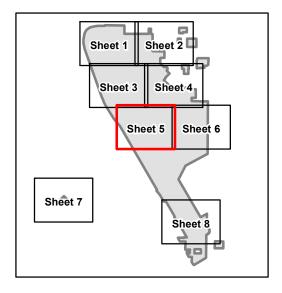


Figure 3
Sheet 5 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

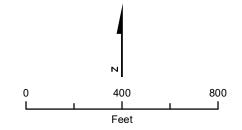




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



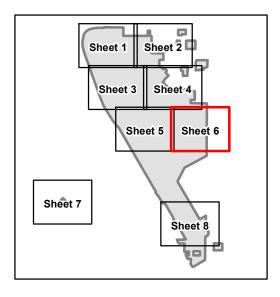


Figure 3
Sheet 6 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

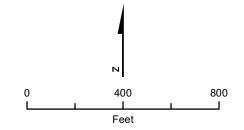




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



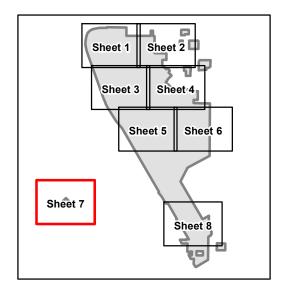


Figure 3
Sheet 7 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California

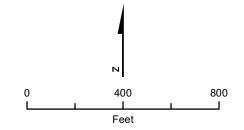




March Air Reserve Base Boundary

Resource Eligibility Status

- Contributing
- ---- Contributing
- Previously Determined Non-Contributing but Presently Contributing
- Previously Unevaluated but Presently Contributing
- Non-Contributing
- Previously Determined Contributing but Presently Non-Contributing
- Individually Eligible/Contributing
- Not Individually Eligible



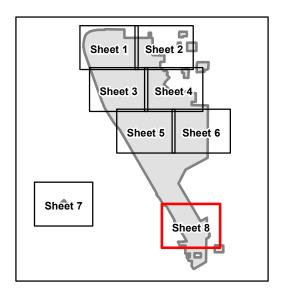


Figure 3
Sheet 8 of 8
March Air Reserve Base ICRMP Update,
February 2019, Resource Map
Riverside County, California



No TCPs have been previously identified at March ARB. As part of March ARB's realignment in 1996, an ethnographic and ethnohistorical study was prepared, entitled *Review of Traditional Native American Territories and Traditional Cultural Properties for March Air Force Base*. The study noted that the San Manuel Band of Mission Indians consider the area important as a place to revive their traditional cultural practices; however, the study concludes that March ARB "does not meet the criteria for a TCP because it lacks association and integrity of association." Their conclusion is based on the lack of clear and unambiguous evidence to tie the property to a particular native group's traditional territory.

8.4 Installation Areas of Concern

It is unlikely that any surface archaeological material would be encountered during the course of standard base operations within the boundary of March ARB in the future. However, there is the potential for buried deposits and features, particularly in association with present or former drainages and other natural water sources on the installation.

The current March ARB boundaries contain no previously recorded archaeological resources; however, one glass fragment isolate previously was identified within the airfield. The resource has not been recorded, and remains in place. Because most of the installation has been covered by pavement and structures for nearly a century, it is quite possible that unrecorded archaeological resources or features lie buried beneath the surface. Historic-era features such as cellars, wells, privies, foundations, and refuse dumps might be located almost anywhere in the vicinity of former residences, farms/ranches, settlements, railroad construction camps, or other loci of activity dating to before the construction of Alessandro Airfield. Prehistoric sites and features are most likely to be preserved on ancient surfaces that now lie buried beneath more-recent sediments, especially near sources of fresh water. These areas of high probability for buried archaeological resources can be identified only by reviewing the mapped soils, hydrology, and geology of the installation.

As discussed in previous sections, March ARB has been fully surveyed for architectural history resources. Previous surveys have identified one NRHP-listed historic property: the MFHD. The surveys completed as part of this ICRMP identified one additional individually eligible historic property: the NRHP-eligible Building 413 (which is also a contributing resource to the MFHD).

Within the district boundary, there is a high probability for encountering architectural history resources, as the majority of buildings and structures within the district are contributing resources to the district's historic significance. Therefore, any construction-related activities located within the MFHD are likely to have an effect on historic properties and should be coordinated with the CRM early in the planning process. In addition, new construction outside of but at or near the boundary of the MFHD, and in some cases, demolitions of existing buildings outside the MFHD, can affect the visual quality, aesthetics, and historic setting of the district. Therefore, these visual impacts to the MFHD should be considered. As additional resources at the base reach 45 years in age, they should be evaluated for NRHP eligibility.

8.5 Other Cultural Resources

Alessandro Airfield was constructed many decades before the passage of the NHPA or the issuance of EO 11593. Before 1966, it was not required that federally managed lands be inventoried for archaeological resources. By the 1970s, when such inventories began, the built environment of March AFB already covered the entire area of what is now March ARB. Thus, even though all of the installation was surveyed

Baksh, Michael, Andrew Robert Pigniolo, and Richard Bark. "Where Territories Merge: An Ethnohistoric and Ethnographic Review of Traditional Native American Territories and Traditional Cultural Properties for March Air Force Base, California." Tierra Environmental Services, San Diego, for Earth Tech, Inc., Colton, California, 1999: 2.

for cultural resources prior to the 1996 realignment, any subsurface archaeological features or deposits present at March ARB would not have been identified or recorded.

No additional surface archaeological surveys need to be scheduled for the current installation. However, future projects that include the removal of surface facilities (runways, buildings, sidewalks, etc.) or subsurface excavation (footings, water lines, etc.) should include monitoring by a qualified professional archaeologist, in the event that archaeological materials are unearthed. Any such materials would be treated as an inadvertent discovery. Refer to Section 7.4 for additional information.

9.0 GOALS AND OBJECTIVES

The installation establishes long term, expansive goals and objectives to protect historic properties and other cultural resources while accomplishing mission objectives. These goals and objectives may serve as drivers for implementation of this ICRMP and for funding of related projects and activities. Several of the goals and objectives have been developed based on ongoing or projected issues facing the installation. The Goals and Objectives table below summarizes key goals and objectives for the Cultural Resources Management Program.

Goals and Objectives

Goal	Associated Objectives	Status
Comply with Section 306108 of the NHPA	Identify, evaluate, and nominate historic properties to the NRHP	Ongoing
	Take into account effects of undertaking on historic properties	
	Reduce or avoid adverse effects to significance cultural resources or historic properties that could result from project activities	
Comply with Sections 306101-306114 of the NHPA	Identify and evaluate resources for NRHP eligibility as they reach 45 years of age, or new developments, perspectives, and scholarship develop regarding resources from the recent past or Cold War era	Ongoing
	Maintain an up-to-date inventory of historic properties	
Ensure compliance with all applicable federal and state environmental legislation, regulations, and guidelines	Includes AFIs, AIRFA, ARPA, DoD guidance and policies, the NHPA, and the NAGPRA	Ongoing
Facilitate and streamline interaction with federal, state, and local agencies and Native American Tribes	Foster good will and positive interactions	Ongoing
Internal training	Continue the implementation of a cultural resources training program that highlights awareness of cultural resources and appropriate management procedures for installation staff, particularly project managers, maintenance personnel, and all tenant organizations.	Ongoing
Annual Report	Write and submit the Annual Report, which is required by the Routine Maintenance PA	In progress

Goal	Associated Objectives	Status
Review and update the ICRMP	 Conduct an annual review of this ICRMP and make minor revisions Perform a five-year update of the ICRMP prior to 2024 	In progress
Update the Maintenance Manual	The Maintenance Manual should be updated to include current information related to the base's existing historic properties, updated character-defining features and non-character defining features, updated proposed treatments and common maintenance activities, and additional compatible and substitute building materials for contributing resources	Need to program
Develop an historic landscape plan	• The historic landscape plan should inventory the existing landscape and streetscape elements considered character-defining features of historic properties and identify measures consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties that will preserve the historic character of the base while also reducing watering requirements or landscape maintenance activities. This may include identifying sustainable landscapes and xeriscape measures within the MFHD boundaries	Need to program
Complete a safety study for historic properties at the base	The safety study should identify measures that will protect people and property from potentially unsafe conditions at historic properties. This may include measures such as adding guardrails near open ditches or protective fencing near vacant buildings. These measures should be developed IAW the Secretary of the Interior's Standards for the Treatment of Historic Properties	Need to program
Establish a curation and collection agreement	Secure fire-safe location for cultural resources management program files and materials	Need to program
Consideration of new PA related to maintenance activities based on present types of maintenance activities being planned or considered	The existing Routine Maintenance PA, executed in 1998, may be amended or a new one executed to address updated proposed treatments and common maintenance activities, and additional compatible and substitute building materials for the contributing resources. The new PA can be aligned with the current and future missions of the base and the USAF	Need to consider
Consideration of development of a NAGPRA Comprehensive Agreement and Installation Tribal Relations Plan (ITRP) with Native American tribes to outline processes for consultation activities	The development of a NAGPRA Comprehensive Agreement and ITRP with Native American tribes can establish specific consultation protocols and notification methods that the base can follow, as well as identify certain types of project types or project locations that would not require extensive consultation.	Need to consider

Goal	Associated Objectives	Status
Consideration of updating NRHP Registration Form for the MFHD based on changes to contributing and non-contributing resources	To initiate modification of a NRHP Registration Form, SHPO must be notified of recommended changes to the existing nomination via a letter. Following review of the letter, SHPO will provide instruction if any additional documentation is needed. Depending on the nature of the changes, SHPO may be able to submit a revised nomination form directly to the Keeper of the Register, or if the changes are substantial, they will require review and comment by the State Historical Resources Commission	Need to consider
Consideration of nominating Building 413 to the NRHP as an individual resource.	An overview of the process to nominate an individual resource to the NRHP (such as Building 413) is the following:	Need to consider
	Complete the NRHP Registration Form (NPS Form 10-900) and the NRHP Continuation Sheet (NPS Form 10-900-a)	
	Consult National Register Bulletin 15, National Register Bulletin 16A, and the National Register Photo Policy Factsheet for instructions on how to complete the NRHP Registration Form	
	Submit cover letter, completed NRHP Registration Form, photographs, digital media, and maps to the SHPO for review. Review OHP's <i>Checklist for</i> Submission: NRHP Nomination Packet for submittal requirements and a checklist of submittal materials	
	SHPO staff review NRHP nomination to ensure adequacy of the form	
	SHPO staff then notifies all appropriate parties (i.e., property owner, local jurisdiction) that the property will be reviewed by the State Historical Resource Commission at a public meeting. If approved by the commission, it is sent by the SHPO to the Keeper of Register for NRHP listing. Final determination is made by the Keeper of Register within 45 days	

NOTE: Refer to the Cultural Resources Environmental Action Plan (EAP) when setting goals. Document installation objectives and supporting tasks in the ICRMP as well as into the EAP tool.

10.0 PROGRAMMING AND PLANNING

10.1 USAF and Installation Actions

USAF and installation mission-related activities have the potential to adversely affect cultural resources and historic properties. Federal regulations and USAF policy require that cultural resources are protected

The California OHP provides more detailed instructions on how to nominate a California property to the NRHP at http://www.ohp.parks.ca.gov/?page_id=21237. The website also provides links to the NRHP Registration Form, Continuation Sheet, National Register Bulletin 15, National Register Bulletin 16A, the National Register Photo Policy Factsheet, and OHP's Checklist for Submission: NRHP Nomination Packet, among other resources.

or effects to said resources are minimized or mitigated. Activities or projects that could pose an adverse effect to cultural resources include, but are not limited to:

- Continued use, repair, modernization, adaptation/reuse, preservation, and/or demolition of existing facilities, including historic buildings
- New construction of facilities
- Land use (e.g., training exercises, flight operations, off-road vehicular traffic, forest management, threatened and endangered species management, wildland fire suppression, erosion control, prescribed burning, and live ordnance use)
- Ground disturbance

The installation eliminates and/or resolves conflicts by assuring that undertakings with the potential to adversely affect cultural resources are properly planned and executed. The CRM and installation project managers and planners work together to identify and manage potential conflicts. Adverse effects to cultural resources resulting from standard or routine activities may be avoided or mitigated by following established environmental and cultural resources management procedures (i.e., completing AF Form 813).

Installation Supplement – USAF and Installation Actions

No supplemental programming and planning information beyond what is discussed in previous sections has been identified.

The 'Mission Activities and Solutions' table below identifies mission-related activities that will adversely affect cultural resources and proposed solutions and mitigating activities to address the identified effect.

Mission Activities and Solutions

USAF/Installation Activity and Cultural Resources Affected	Solutions and Mitigating Activities	Status
OMB Memorandum M-12-12 Section 3: Freeze the Footprint, and the 20/20 by 2020 AF Goal	Evaluate and consult on buildings	Active
Demolition of historic structures due to either excess space or mission requirements for modern facilities	Surveys as required, standard Section 306108 consultation and mitigation as agreed in PA.	Active
Installation of new utilities or other earth disturbing activities	Standard Section 306108 consultation surveys as required.	Active

10.2 Cultural Resources Project Programming and Execution

The CRM, with support from the AFCEC Section, ensures that cultural resource management activities are planned and programmed to receive funding. Cultural resource projects and actions may be required by: agreement documents, results of gap analyses, audit/assessment findings, ongoing program requirements (e.g., Sections 306101(a) and 306102 surveys and evaluations), urgent installation needs (e.g., changes to military training requirements), and other drivers. Cultural resources activities are executed according to fund eligibility guidelines. The Environmental Quality PPBE Playbook and the Activity Management Plan Playbooks contain detailed instruction on programming and planning.

The 'Project Programming and Execution Work Plan' table below outlines cultural resources management requirements for the five years of this ICRMP cycle. Projects entered into this Work Plan should match

APSR entries. The link below is to a spreadsheet posted on the installation's eDASH cultural resources page, which contains a detailed list of all installation cultural resources requirements over the five-year period of the ICRMP. This spreadsheet is prepared by the Section through a download from the APSR, then forwarded to the CRM for posting. The installation and Section must download and post the link at least once per year.

Installation Supplement - Cultural Resources Project Programming and Execution

Project Programming and Execution Work Plan

FY	Project Title and Description	Acquisition Strategy and Execution Agent	Status/Notes
2019	ICRMP	Consult with	In progress
		Brent S. Hefty, Cultural Resources	
		Program Manager, AFRC	
		Phone: (478) 327-2479	
		Email: brent.hefty@us.af.mil	
2019	Consultation support	Consult with	Ongoing
		Brent S. Hefty, Cultural Resources	
		Program Manager, AFRC	
		Phone: (478) 327-2479	
		Email: brent.hefty@us.af.mil	
2019	Section 306101-306114	Consult with	Planned
	updates	Brent S. Hefty, Cultural Resources	
		Program Manager, AFRC	
		Phone: (478) 327-2479	
		Email: brent.hefty@us.af.mil	
2019	Historic district surveys	Consult with	In progress
	_	Brent S. Hefty, Cultural Resources	
		Program Manager, AFRC	
		Phone: (478) 327-2479	
		Email: brent.hefty@us.af.mil	

11.0 REFERENCES

11.1 Standard References (Applicable to all USAF Installations)

- AFI 32-7001, Environmental Management (includes UEC Role)
 - o http://static.e-publishing.af.mil/production/1/af a4/publication/afi32-7001/afi32-7001.pdf
- AFI 32-7065, Cultural Resources Management
 - o http://static.e-publishing.af.mil/production/1/af a4/publication/afi32-7065/afi32-7065.pdf
- AFI 90-2002, Air Force Interactions with Federally Recognized Tribes
 - http://static.e-publishing.af.mil/production/1/saf_ie/publication/afi90-2002/afi90-2002.pdf
- Cultural Resources EAP
 - o https://cs2.eis.af.mil/sites/10040/wpp/eaptool/eap_view.aspx?eapid=559
- Cultural Resources Management Playbook
 - o https://cs2.eis.af.mil/sites/10041/ceplaybooks/cr/pages/overview.aspx
- eDASH AFLOA Legal and Other Requirements List

- o https://cs2.eis.af.mil/sites/10040/lists/afloalegal/allitems.aspx?filterfield1=program%5fx0 020%5farea&filtervalue1=cultural%20resources
- <u>eDASH Cultural Resources Home Page</u>
 - o https://cs2.eis.af.mil/sites/10040/wpp/programpage/programpage.aspx?program=cultural %20resources
- <u>eDASH Training Matrix</u>
 - o https://cs2.eis.af.mil/sites/10040/lists/trainingmatrix/allitems.aspx?filterfield1=program% 5fx0020%5farea&filtervaue1=cultural%20resources
- Environmental Reporting Playbook
 - o https://cs2.eis.af.mil/sites/10041/ceplaybooks/er/pages/overview.aspx
- Environmental Quality PPBE Playbook
 - o https://cs2.eis.af.mil/sites/10041/ceplaybooks/eqppbe/pages/overview.aspx
- ISO 14001, Environmental Management Systems–Requirements with Guidance for Use
 - o https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-3:v1:en
- Activity Management Plan Playbooks

11.2 Installation References

Reports

- Allen, Polly. National Register of Historic Places Registration Form for March Field Historic District (Amendment), 2012. JRP Historical Consulting Services.
- Altschul, Jeffrey H. and Donn R. Grenda (editors). "Islanders and Mainlanders: Prehistoric Context for the Southern California Bight." SRI Press, Tucson, Arizona, 2002.
- Baksh, Michael, Andrew Robert Pigniolo, and Richard Bark. "Where Territories Merge: An Ethnohistoric and Ethnographic Review of Traditional Native American Territories and Traditional Cultural Properties for March Air Force Base, California." Tierra Environmental Services, San Diego, for Earth Tech, Inc., Colton, California, 1999.
- Department of Defense Instruction 4715.3. Environmental Conservation Program. May 3, 1996.
- Department of Defense Instruction 4715.16. *Cultural Resources Management*. September 18, 2008.
- Deputy Assistant Secretary of Defense for Infrastructure. *Department of Defense Base Structure Report***Report FY 2-18 Baseline. 2018. https://www.acq.osd.mil/eie/Downloads/BSI/Base%20Structure%20Report%20FY18.pdf. Accessed May 13, 2019.
- Drucker, Philip. "Culture Element Distribution: VI Southern California." University of California Anthropological Records 1(1), 1937.
- Grenda, Donn. Continuity and Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore. Prepared for the U.S. Corps Army of Engineers, Los Angeles District. Statistical Research, Inc., Tucson, Arizona, 1997.
- Grenda, Donn. Between the Coast & the Desert: Archaeological Data Recovery at the Yukaipa't Site, CA-SBR-1000, Yucaipa, California. Statistical Research, Inc., Technical Series 70, Tucson, Arizona, 1998.
- Johnson, Patti. Inventory and Evaluation of World War II Structures March Air Force Base, Riverside, California, 1991.
- JRP Historical Consulting Services. Cold War Cultural Resources Inventory and Evaluation,

- Update Report, March Air Reserve Base, Riverside County, California. Prepared for Civil Engineering Support/Environmental Management Office, March Air Reserve Base, April 2013.
- JRP Historical Consulting Services. *Integrated Resources Management Plan, March Air Reserve Base (March ARB), Riverside County, California.* Prepared for Civil Engineering Support/Environmental Management Office, March Air Reserve Base, April 2011.
- JRP Historical Consulting Services. *Maintenance Manual for Buildings within the March Field Historic District, March AFB, Riverside, California.* Prepared for U.S. Army Corps of Engineers, Los Angeles District and March Air Force Base, November 1995.
- JRP Historical Consulting Services. National Register of Historic Places Registration Form for March Field Historic District, 1992.
- McDonald, M. and B. Giacomini. Phase I Archaeological Survey from 2500 Acres at March Air Force Base, Riverside County. Report on file, Environmental Management, March Air Reserve Base, Riverside, CA. 1996.
- Lerch, Michael K., and Amanda C. Cannon. Mystic Paavo Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California. Statistical Research, Inc., Technical Report 05-34, Redlands, California. Submitted to the County of Riverside, 2008.
- William Manley Consulting. *Historic Building Inventory and Evaluation, March Air Force Base, Riverside County, California.* 1995.

Published

- Advisory Council on Historic Preservation. "Protection of Historic Properties." 36 CFR 800.
- Bean L.J. "Cahuilla." In *Handbook of North American Indians*. Volume 8. Washington, D.C.: Smithsonian Institution, 1978.
- Bean, Lowell John. "Comment Letter to the US Air Force dated August 28, 1997." In Baksh, "Where Territories Merge: An Ethnohistoric and Ethnographic Review of Traditional Native American Territories and Traditional Cultural Properties for March Air Force Base, California," Michael, Andrew Robert Pigniolo, and Richard Bark, Tierra Environmental Services, San Diego, for Earth Tech, Inc., Colton, California.
- Butler, William J. *Images of America: March Air Force Base*. Arcadia Publishing, 2009.
- Federal Register 69: 128, 40544-40555.
- Harley, Bruce. *March Field Story*, 1918-1978. Published by March Air Force Base, California, 1978.
- Heizer, Robert F. *Handbook of North American Indians: Volume 8 California*. Smithsonian Institution, Washington, D.C., 1978.
- Kroeber, A.L. "Handbook of the Indians of California." *Bureau of American Ethnology Bulletin 78* (1925): 578-580.
- Moratto, Michael J. California Archaeology. San Francisco, California: Academic Press, 1984.
- National Historic Preservation Act of 1966. 54 U.S.C. 300101, et seq. (as amended through 2016).
- Phillips, G.H. Chiefs and Challengers. University of California Press: Berkeley, California, 1975.
- Programmatic Agreement Among the Air Force Reserve, the Advisory Council on Historic Preservation, and the California State Historic Preservation Officer Regarding Routine Maintenance of Historic Properties Within the March Air Reserve Base Historic District, Riverside County, California.

- Programmatic Agreement Between the United States Department of the Air Force and the California State Historic Preservation Officer for the Disposal of Portions of March Air Force Base, California.
- "The Secretary of the Interior's Standards and Guidelines for Federal Agency Historic Preservation Programs Pursuant to the National Historic Preservation Act." Federal Register 63: 79 (April 24, 1998): 20499.
- Strong, William D. "Aboriginal Society in Southern California." *University of California Publications in American Archaeology and Ethnology*, Volume 26 (1929): Map 7.
- True, Delbert L. "The Pauma Complex in Northern San Diego County." *Journal of New World Archaeology* 3(4). 1980, 1-39.
- U.S. Department of the Interior, National Park Service, "National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation," 1990, revised 1991, 1995, 1997. https://www.nps.gov/nr/publications/bulletins/pdfs/nrb15.pdf. Accessed March 26, 2019.
- U.S. Department of the Interior, National Park Service, "National Register Bulletin 16A: Guidelines for Completing National Register of Historic Places Form, Part A: How to Complete the National Register Form," 1977, revised 1986, 1991, 1997. https://www.nps.gov/nr/publications/bulletins/pdfs/nrb16a.pdf. Accessed March 26, 2019.
- U.S. Department of the Interior, National Park Service, "Secretary of the Interior's Standards and Guidelines for Architectural and Engineering Documentation: HABS/HAER Standards," 1990, originally published in *Federal Register*, Vol. 48, No. 190, (Thursday, September 29, 1983), 44730-44734.
- U.S. Department of the Interior, National Park Service. 36 CFR 800 Protection of Historic Properties, incorporating amendments effective August 5, 2004).

Unpublished

- Johnson, John. Personal communication with Sharon Waechter, Far Western Anthropological Research Group, Inc., November 22, 2010 concerning traditional territories in the MARB vicinity.
- Lerch, Michael K. and Amanda C. Cannon. *Mystic Paavo Cultural Resources Survey and Evaluation of The Villages of Lakeview Specific Plan, Riverside County, California.* Statistical Research, Inc., Technical Report 05-34, Redlands, California. Submitted to the County of Riverside, 2008.
- March Field Air Museum. "Bob Hope and the USO: 1941-1991." Exhibit, 2019.
- U.S. Department of the Interior, National Park Service, "National Register Photo Policy Factsheet updated 5/15/2013," 2013. https://www.nps.gov/nr/publications/guidance/Photo_Policy_final.pdf. Accessed March 26, 2019.

12.0 ACRONYMS

12.1 Standard Acronyms (Applicable to all USAF Installations)

- eDASH Acronym Library
- Cultural Resources Management Playbook Acronym Section
- U.S. EPA Terms & Acronyms

12.2 Installation Acronyms

•	°F	Fahrenheit
•	4 AF	Fourth Air Force
•	15 AF	Fifteenth Air Force
•	22 AFRES	22 nd Air Refueling Squadron
•	22 ARW	22 nd Air Refueling Wing
•	22 BW	22 nd Bombardment Wing
•	44 BW	44 th Bombardment Wing
•	452 AMW	452 nd Air Mobility Wing
•	722 ARW	722 nd Air Refueling Wing
•	AIRFA	American Indian Religious Freedom Act
•	AFI	Air Force Instruction
•	AFLOA	Air Force Legal Operations Agency
•	AFMAN	Air Force Manual
•	AFRC	Air Force Reserve Command
•	AFRMS	Air Force Records Management System
•	AMC	Air Mobility Command
•	ANG	Air National Guard
•	ARB	Air Reserve Base
•	BCE	Base Civil Engineer
•	BRAC	Base Realignment and Closure
•	CA	Comprehensive Agreements
•	CHRIS	California Historical Resources Information System
•	CRS	Cultural Resource Specialist
•	DENIX Exchange	DoD Environment, Safety and Occupational Health Network and Information
•	DPR	Department of Parks and Recreation
•	EMP	Environmental Management Plan
•	ICBM	Intercontinental Ballistic Missile
•	IMT	Information Management Tool
•	ITLO	Installation Tribal Liaison Officer
•	ITRP	Installation Tribal Relations Plan

• JRP Historical Consulting Services, LLC

Office of Primary Responsibility

• March ARB March Air Reserve Base

MFHD March Field Historic District
 MJPA March Joint Powers Authority
 OHP Office of Historic Preservation

• POW Prisoner of war

SAC Strategic Air Command
 TAC Tactical Air Command

• TCP Traditional Cultural Property

• U.S. United States

• UEC Unit Environmental Coordinator

• USAF United States Air Force

USO United Service Organization

13.0 DEFINITIONS

OPR

13.1 Standard Definitions (Applicable to all USAF Installations)

• Refer to the definitions section of the Cultural Resources Management Playbook

13.2 Installation Definitions

• No installation-specific definitions have been identified

14.0 INSTALLATION-SPECIFIC CONTENT

There are two unique maintenance requirements associated with historic properties at March ARB that must be integrated into the cultural resources management program. These requirements have been developed to facilitate the effective management of historic properties on base and have done much to streamline management of maintenance activities and integrate effective preservation strategies into ongoing maintenance activities. The first unique requirement governing maintenance activities is the Maintenance Manual. The manual was developed to provide basic preservation guidance to personnel about how to treat buildings in the district and includes comprehensive guidelines for appropriate maintenance and restoration measures. The manual shall be consulted for all military construction and operation and maintenancerelated construction, renovation, and maintenance activities within the district and is also on file for personnel reference in the Environmental Management Office. The Maintenance Manual was developed in 1995, and it is recommended that the BCE and CRM consider updating the Maintenance Manual to ensure its accuracy and validity and encompass changes to any contributing and non-contributing resources (refer to Section 9.0). The development of the Maintenance Manual provided the conceptual foundation for the second unique maintenance requirement at March ARB. The second requirement is adherence of all maintenance activities within the MFHD to the Routine Maintenance PA. This PA exempts routine maintenance activities within the district from consultation under NHPA Section 306108 if the maintenance activities adhere to the guidelines and treatment techniques of the Maintenance Manual. Maintenance activities that do not incorporate the guidelines of the Maintenance Manual are not exempt from consultation under Section 306108. The Routine Maintenance PA and Maintenance Manual are included in Appendixes E and K.

APPENDIXES

Appendix A. Archaeological Resources Inventory Tables

No previously recorded archaeological sites are located within the boundaries of March ARB. An isolate, consisting of a glass fragment, has previously been identified within the airfield but has not been recorded. The glass fragment remains in place. Refer to Section 8.3 for more information.

Appendix B. Built Resources Inventory Tables

Refer to Appendix B Excel file for a list of resources surveyed at March ARB as part of this ICRMP.

Appendix C. Traditional Cultural Resources Inventory Tables

No known TCPs are located within the boundaries of March ARB; refer to Section 8.3 for more information.

Appendix D. NHPA Section 306108 Memoranda of Agreement

No MOAs have been executed.

Appendix E. NHPA Section 306108 Programmatic Agreements

Programmatic Agreement Among the Air Force Reserve, the Advisory Council on Historic Preservation, and the California State Historic Preservation Officer Regarding Routine Maintenance of Historic Properties Within the March Air Reserve Base Historic District, Riverside County, California

Appendix F. Installation Tribal Relations Plan

No Installation Tribal Relations Plan has been executed.

Native American points of contact are provided in Section 2.0.

Appendix G. Tribal Agreements

No Tribal Agreements have been executed.

Appendix H. Wing Instructions or Policy Documents

No Wing Instruction or Policy Documents have been developed for the Cultural Resources Management Program.

Appendix I. Archaeological Survey and Site Forms

All areas of the former and current installation have been surveyed for surface archaeological resources, and no previously recorded resources were identified within the current boundaries of March ARB. An isolate, consisting of a glass fragment, has previously been identified within the airfield but has not been recorded. The glass fragment remains in place.

Appendix J. Historic Property Survey and Site Forms

Historic property survey and site forms are located in Appendix A of Volume II of this ICRMP, which contains DPR 523 Series Forms prepared for this ICRMP. All previously prepared survey and sites forms are on-file with March ARB and at the CHRIS.

Appendix K. Historic Building Maintenance Plans

Maintenance Manual for Buildings within the March Field Historic District, March AFB, Riverside, California. Prepared for U.S. Army Corps of Engineers, Los Angeles District and March Air Force Base, November 1995.

Appendix L. Privatized Housing Documents

None at this time.



Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
100	1929]	The March Inn	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination for March Field Historic District (Amendment), 2012 (hereafter referred to as MFHD NRHP Nomination Amendment, 2012) JRP Consulting Services, National Register of Historic Places Registration Form for March Field Historic District, 1992 (hereafter referred to as NRHP Nomination, 1992)
102	1932	The March Inn and McBride Suites	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
108	1934	Storage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
110	1934	The Hap Arnold Club	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
115	1931	610th Air Operations Group	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
176	1930	452nd Air Mobility Wing Headquarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
177	1929	Commanding Officer's Garage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
181	1950	Sally's Alley Casual Bar (club operations building)	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 JRP Historical Consulting Services, Cold War Cultural Resources Inventory and Evaluation Update Report, March Air Reserve Base, Riverside County, California, 2013 (hereafter referred to as Cold War Update Report, 2013 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
238	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
239	1930	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
240	1930	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
241	1930	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
242	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
243	1930	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
244	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
245	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
246	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
247	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
248	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
249	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
250	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
251	1931	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012
258	1951	Transient Alert (storage)	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		MFHD NRHP Nomination, 1992 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
260	1952	Night Lighting Vault	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
300	1929	Boeing C-17 Field Services	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
301	1932	922nd Civil Engineering Flight S-Team	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
311	1929	Clay Hall (enlisted dorm)	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
315	1936	Storage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
317	1934	Medical Administration Offices	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
323	1931	4th Air Force Headquarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
355	1929	452nd Maintenance Shop	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
356	1929	452nd Maintenance Group	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
362	1932	Garage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
364	1932	Garage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012
365	1993	Garage	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	2012 (added as a Non-Contributor to the MFHD)		MFHD NRHP Nomination, 1992 DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012
373	1929	Department of Homeland Security Maintenance Shop, Customs and Border Protection Riverside Air Unit	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
378	1954	4th Air Force Storage Building	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
381	1934	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
382	1934	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
383	1934	Visiting Airmen's Quarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
386	1931	Building 301 Storage	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
394	1952	452nd Air Mobility Wing Safety Education Building	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
400	1929	Kisling Hall (enlisted dorm)	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
405	1938	Sabor Contractor Exbon	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination (Amendment), 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
406	1934	Water Reservoir	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination (Amendment), 2012 MFHD NRHP Nomination, 1992
407	1934	Water Tower	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination (Amendment), 2012 MFHD NRHP Nomination, 1992
408	1934	Water Reservoir	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination (Amendment), 2012 MFHD NRHP Nomination, 1992
409	1934	Water Reservoir	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Polly Allen, March Field Historic District National Register of Historic Places Nomination (Amendment), 2012 MFHD NRHP Nomination, 1992
410	1927	Water Tower Storage	Refer to Figure 2 in ICRMP Update Volume I	Previously Determined Non- Contributing to the MFHD but Presently Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
411	1927	Water Pump House	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
412	1943	Water Pump House	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
413	1917	Operations Supervisor Assistant & Training Section	Refer to Figure 2 in ICRMP Update Volume I	Individually Eligible/Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
415	ca. 1987	Garage	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
417	1937	452nd AMW/IP	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
418	1934	Motor Pool Building	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
420	1931	452nd Aviation Flight Support	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
426	1964	March Inn Business Center	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
429	1929	752nd Aircraft Maintenance	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
430	1931	452nd Prime Ribs	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
431	1929	Electrical Switch House	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
432	1941	Air Force Inn Linen Exchange	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
433	1931	March Field Total Force Gonor Guard	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
434	1933	Ticket & Tours, Outdoor Recreation Office	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
435	1931	Lodging Supply	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
439	1932	Water Pump House	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
440	1929	452nd Aerospace Ground Equipment	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
442	1974	452nd Air Mobility Wing	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
449	1941	452nd Operational Contracting Office	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
450	1949	Beacon Light	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
452	1929	Explosive Ordnance Disposal Shop	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
453	1929	452nd Mobility Bag Storage Unit	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
454	1980	Loading Platform	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
456	1933	Mathies Hall (enlisted dorm)	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
457	1929	Unnamed Maintenance Shop	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
458	1929	Headquarters, 452nd Medical	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
465	1933	March Field Sports & Fitness Center	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
466	1933	452nd Comptroller	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
467	1933	Base Theater	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
468	1942	Law Center	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
470	1929	Base Headquarters	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
472	1929	Utility Vault	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
479	1938	Storage & Minor Maintenance	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
488	ca. 1970s	Memorial	Refer to Figure 2 in ICRMP Update Volume I	Previously Determined Contributing to the MFHD but Presently Non- Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
496	ca. 1987	Storage	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
497	1931	Water Treatment Plant	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012
601	1967	452nd Aero Medical Staging Squadron	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		MFHD NRHP Nomination, 1992 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
625	1968	Reserve Component Medical Training Building	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
758	1974	March Air Reserve Base Exchange	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1201	1970	General Purpose Aircraft Shop	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1203	1970	Reserve Civil Engineering Facility	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1211	1957	452nd Aircraft Maintenance Squadron	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1212	1957	Communications Squadron Administration	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1213	1957	Environmental Health	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1214	1957	452nd Emergency Management Flight	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1217	1954	Base Fuels	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
1218	1954	Petroleum/Oil /Lubricant Support Storage for Building 1217	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019
		1217					Cold War Update Report, 2013
1221	1956	Maintenance Shop	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 William Manley Consulting, Historic Building Inventory and Evaluation, March Air Force Base, Riverside County, California, 1995 (hereafter referred to as Historic Building Inventory and Evaluation, 1995)
1241 and 1242	1961	Storage Building Wash Rack Pad	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1244	1963	452nd MXS Fuel System	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Historic Building Inventory and Evaluation, 1995
1246	1967	Maintenance Dock	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Historic Building Inventory and Evaluation, 1995
1247	1967	Pump Station	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1250	1967	Fire Truck and Refueling Maintenance Facility	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1254	1971	Liquid Oxygen Storage Area	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1256	1964	Liquid Oxygen Storage Area	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1267	1941	BE Storage CV Facility	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1301	ca. 1957	TACAN	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
1511	1960	Airfield Apron	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Patti Johnson, Inventory and Evaluation of World War II Structures, March Air Force Base, Riverside, California, 1991 (hereafter referred to as Inventory and Evaluation of World War II Structures, 1991)
1518	1967	Airfield Apron	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991
1522	1951	Airfield Runway	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991
1523	1958	Airfield Runway Overrun	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991
1524	1967	Airfield Runway	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991
1536	1967	Airfield Taxiway	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991
1538	1958	Airfield Power Check Pad	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Inventory and Evaluation of World War II Structures, 1991

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
							DPR 523 Series Forms prepared for ICRMP Update, 2019
1539	1958	Airfield Runway Shoulders	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		Cold War Update Report, 2013
							Inventory and Evaluation of World War II Structures, 1991
							DPR 523 Series Forms prepared for ICRMP Update, 2019
1540	1958	Airfield Runway Shoulder	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		Cold War Update Report, 2013
							Inventory and Evaluation of World War II Structures, 1991
1618	1967	Vehicle Parking	Refer to Figure 2 in	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
			ICRMP Update Volume I	, ,			Cold War Update Report, 2013
1800	1985	TACAN Backup Electrical Generator	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1801A	1991	TACAN Backup Electrical Generator	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1900	1952	High Intensity Runway Lighting	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
							Cold War Update Report, 2013
1901	1952	Taxiway Lighting	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
							Cold War Update Report, 2013 DPR 523 Series Forms prepared for ICRMP
1902	1956	Approach Lighting	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		Update, 2019
							Cold War Update Report, 2013
1903	1963	Airfield Special Lighting	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
							Cold War Update Report, 2013
2150	1957	TACAN	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
			•				Cold War Update Report, 2013
2202	1953	Fuel Pump Station	Refer to Figure 2 in	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019
			ICRMP Update Volume I				Cold War Update Report, 2013
2203	1954	Gasoline Storage Tank	Refer to Figure 2 in	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019
		<i>g</i>	ICRMP Update Volume I	, 8			Cold War Update Report, 2013
2204	1954	Gasoline Storage Tank	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019
							Cold War Update Report, 2013

Buildin	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
2205	1954	Jet Fuel Storage Tank	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019
2300	1955	Medical Squadron Training	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		Cold War Update Report, 2013 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2301	1955	Water Supply Storage	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2302	1955	Water Fire Pump Station	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2303	1955	542 MXS Aero Repair Shop	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Historic Building Inventory and Evaluation, 1995 Inventory and Evaluation of World War II Structures, 1991
2304	1933	Gatehouse	Refer to Figure 2 in ICRMP Update Volume I	Previously Unevaluated but Presently Contributing to the MFHD	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
2305	1965	163rd Aircraft Maintenance Squadron	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Historic Building Inventory and Evaluation, 1995 Inventory and Evaluation of World War II Structures, 1991
2306	1967	Maintenance Dock	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013 Historic Building Inventory and Evaluation, 1995
2310	1968	Base Supply Warehouse	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2311	1965	Sewage Pump Station	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
2405	1942	Traffic Management Facility	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
2406	1971	Post Office	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
2418	1968	The March Inn	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2419	1959	The March Inn	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2420	1968	The March Inn	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2421	1968	The March Inn	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2558	ca. 1984	Platform Scale	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
2620	1952	Base Communications Building	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
6005	1967	Small Arms Range Support Building	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
6006	1942	Small Arms Range	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
6515	1947	Fuel Unloading Platform	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
6603	Between ca. 1967 and 1997	Reservoir	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
6604	1965	Hospital Drains	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
8005	1963	Obstruction Lights	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		Cold War Update Report, 2013 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Papert, 2013
9015	1953	Exterior Area Lighting	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		Cold War Update Report, 2013 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013

Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
ca. 1960s	Traffic Lights	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1956	Liquid Fuel Pipeline	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1952	Security Alert System	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1949	Vehicle Parking	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1949	Open Auto Storage	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1956	Bridge	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	2013		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1949	Roads	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1953	Driveways	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1968	Curbs and Gutters	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1949	Sidewalks	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
1957	Wind Measuring Set	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
1963	Wind Measuring Set	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		Cold War Update Report, 2013 DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
	ca. 1960s 1956 1952 1949 1949 1956 1949 1953 1968 1949 1957	ca. 1960s Traffic Lights 1956 Liquid Fuel Pipeline 1952 Security Alert System 1949 Vehicle Parking 1949 Open Auto Storage 1956 Bridge 1949 Roads 1953 Driveways 1968 Curbs and Gutters 1949 Sidewalks 1957 Wind Measuring Set	ca. 1960s Traffic Lights Refer to Figure 2 in ICRMP Update Volume I 1956 Liquid Fuel Pipeline Refer to Figure 2 in ICRMP Update Volume I 1952 Security Alert System Refer to Figure 2 in ICRMP Update Volume I 1949 Vehicle Parking Refer to Figure 2 in ICRMP Update Volume I 1949 Open Auto Storage Refer to Figure 2 in ICRMP Update Volume I 1956 Bridge Refer to Figure 2 in ICRMP Update Volume I 1949 Roads Refer to Figure 2 in ICRMP Update Volume I 1949 Roads Refer to Figure 2 in ICRMP Update Volume I 1953 Driveways Refer to Figure 2 in ICRMP Update Volume I 1958 Curbs and Gutters Refer to Figure 2 in ICRMP Update Volume I 1949 Sidewalks Refer to Figure 2 in ICRMP Update Volume I 1957 Wind Measuring Set Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I 1957 Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I Refer to Figure 2 in ICRMP Update Volume I	ca. 1960s Traffic Lights Refer to Figure 2 in ICRMP Update Volume I 1956 Liquid Fuel Pipeline Refer to Figure 2 in ICRMP Update Volume I 1952 Security Alert System Refer to Figure 2 in ICRMP Update Volume I 1954 Vehicle Parking Refer to Figure 2 in ICRMP Update Volume I 1955 Not Individually Eligible ICRMP Update Volume I 1956 Refer to Figure 2 in ICRMP Update Volume I 1956 Bridge Refer to Figure 2 in ICRMP Update Volume I 1956 Refer to Figure 2 in ICRMP Update Volume I 1956 Refer to Figure 2 in ICRMP Update Volume I 1957 Not Individually Eligible ICRMP Update Volume I 1958 Curbs and Gutters Refer to Figure 2 in ICRMP Update Volume I 1959 Refer to Figure 2 in ICRMP Update Volume I 1950 Not Individually Eligible ICRMP Update Volume I 1951 Not Individually Eligible ICRMP Update Volume I 1952 Refer to Figure 2 in ICRMP Update Volume I 1953 Not Individually Eligible ICRMP Update Volume I 1954 Refer to Figure 2 in ICRMP Update Volume I 1955 Refer to Figure 2 in ICRMP Update Volume I 1956 Refer to Figure 2 in ICRMP Update Volume I 1957 Wind Measuring Set Refer to Figure 2 in ICRMP Update Volume I 1957 Wind Measuring Set Refer to Figure 2 in ICRMP Update Volume I 1958 Refer to Figure 2 in ICRMP Update Volume I 1959 Not Individually Eligible ICRMP Update Volume I 1950 Not Individually Eligible ICRMP Update Volume I 1951 Not Individually Eligible ICRMP Update Volume I 1952 Refer to Figure 2 in ICRMP Update Volume I 1953 Not Individually Eligible ICRMP Update Volume I	ca. 1960s Traffic Lights Refer to Figure 2 in ICRMP Update Volume 1 1956 Liquid Fuel Pipeline Refer to Figure 2 in ICRMP Update Volume 1 1952 Security Alert System Refer to Figure 2 in ICRMP Update Volume 1 1949 Vehicle Parking Refer to Figure 2 in ICRMP Update Volume 1 1949 Open Auto Storage Refer to Figure 2 in ICRMP Update Volume 1 1956 Bridge Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1956 Refer to Figure 2 in ICRMP Update Volume 1 1957 Not Individually Eligible N/A* Not Individually Eligible N/A*	cu. 1960s Traffic Lights Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1956 Liquid Fuel Pipeline Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1952 Security Alert System Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1949 Vehicle Parking Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1949 Open Auto Storage Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1956 Bridge Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1956 Bridge Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1949 Roads Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1953 Driveways Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1968 Curbs and Gutters Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1968 Curbs and Gutters Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1968 Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1969 Sidewalks Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1960 Not Individually Eligible N/A* 1960 Refer to Figure 2 in CRMP Update Volume I Not Individually Eligible N/A* 1960 Not Individually Eligible N/A*

Building	gs and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation
20004	1941	Tennis Court	Refer to Figure 2 in ICRMP Update Volume I	Non-Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992 Inventory and Evaluation of World War II Structures, 1991
21000	1949	Fence	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
21001	1949	Fence	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
21026	1964	Fence	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
23001	1965	Vehicle Parking	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019 Cold War Update Report, 2013
Concrete Culvert	ca. 1956	Culvert	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
RV Park	ca. 1977	RV Park	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
Static Display	ca. 1990	Static Display	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
Stone Drainage Canal	1942	Drainage Canal	Refer to Figure 2 in ICRMP Update Volume I	Contributing to the MFHD	1994		DPR 523 Series Forms prepared for ICRMP Update, 2019 MFHD NRHP Nomination Amendment, 2012 MFHD NRHP Nomination, 1992
Tyson Field	ca. 1967	Field	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019
Unnamed Bridge	1940	Bridge	Refer to Figure 2 in ICRMP Update Volume I	Not Individually Eligible	N/A*		DPR 523 Series Forms prepared for ICRMP Update, 2019

^{*} Resources with a "N/A" Date of NRHP Status Determination are previously unevaluated. This includes those resources that were identified in JRP's 2013 Cold War Cultural Resources Inventory and Evaluation Update Report, March Air Reserve Base, Riverside County, California, but not recorded or evaluated. The resources have all been evaluated as part of the ICRMP Update but have not yet received an agency determination.

Building	Buildings and Structures						
Facility Number	Date of Construction	Current Use/Function	Location	NRHP Eligibility/Status	Date of NRHP Status Determination	ACES-PM	Description and Location of Supporting Documentation

References

Allen, Polly. National Register of Historic Places Registration Form for March Field Historic District (Amendment). 2012. JRP Historical Consulting Services. On file at March ARB. Johnson, Patti. Inventory and Evaluation of World War II Structures March Air Force Base, Riverside, California. 1991. On file at March ARB.

JRP Historical Consulting Services. Cold War Cultural Resources Inventory and Evaluation, Update Report, March Air Reserve Base, Riverside County, California. 2013. On file at March ARB.

JRP Historical Consulting Services. National Register of Historic Places Registration Form for March Field Historic District . 1992. On file at March ARB.

William Manley Consulting. Historic Building Inventory and Evaluation, March Air Force Base, Riverside County, California . 1995. On file at March ARB.



PROGRAMMATIC AGREEMENT AMONG THE AIR FORCE RESERVE, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION, AND THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER REGARDING ROUTINE MAINTENANCE OF HISTORIC PROPERTIES WITHIN THE MARCH AIR RESERVE BASE HISTORIC DISTRICT, RIVERSIDE COUNTY, CALIFORNIA

WHEREAS, the Air Force Reserve, March Air Reserve Base, Riverside County, California, has determined that the routine maintenance of historic buildings, structures, and grounds within the March Air Reserve Base Historic District; a property determined eligible for inclusion on the National Register of Historic Places, may have an effect upon the District, and has consulted with the Advisory Council on Historic Preservation (Council) and the California State Historic Preservation Officer (SHPO) pursuant to Section 800.13 of the regulations (36 CFR Part 800) implementing Section 106 of the National Historic Preservation Act (16 USC 470f) and Section 110 of the same Act; and

WHEREAS, the definitions given in Appendix A are applicable throughout this Programmatic Agreement; and

WHEREAS, certain minor undertakings described in Appendix B of this Agreement, if executed in the appropriate manner, can be deemed exempt from further consultation with the SHPO or the Council; and

WHEREAS, the document in Appendix C, Maintenance Manual for Buildings within the March Field Historic District, March Air Reserve Base, Riverside, California shall be used as a reference for maintenance procedures;

NOW, THEREFORE, the Air Force Reserve, the Council, and the SHPO agree that the routine maintenance of historic properties included in the March Air Reserve Base Historic District shall be administered in accordance with the following stipulations to satisfy the Air Force Reserve Section 106 responsibilities for all individual undertakings of the program.

Stipulations

The Air Force Reserve will ensure that the following measures are carried out.

- 1. The Air Force Reserve shall implement the Maintenance Manual for Buildings within the March Field Historic District, March Air Reserve Base, Riverside, California, attached as Appendix C, to ensure long-term protection of historic properties in the March Air Reserve Base Historic District.
- 2. Actions described in Appendix B, "Actions Not Requiring Further Consultation," may proceed with no further consultation.

- 3. With the exception of activities which appear in Appendix B as exemptions to further consultation, the Air Force Reserve will submit undertakings which are subject to review to the SHPO and the Council pursuant to 36 CFR Part 800, et. seq.
- 4. The SHPO will be afforded thirty (30) days after receipt to comment on any documentation submitted by the Air Force Reserve under the terms of this Agreement. Should the SHPO decline to participate or fail to respond within thirty (30) days to a written request for participation, the Air Force Reserve shall consult with the Council to complete the Section 106 process.
- 5. The SHPO and the Council may monitor activities carried out pursuant to this Programmatic Agreement, and the Council will review such activities if so requested. The Air Force Reserve will cooperate with the SHPO and the Council in carrying out their monitoring and review responsibilities.
- 6. The Air Force Reserve shall provide the SHPO and the Council with an annual report each February 1, with the first report due on February 1, 1999. If the Air Force Reserve is unable to submit the report on this date, it shall notify SHPO and the Council in writing of this delay and inform the parties of the expected completion date. This report shall list all undertakings reviewed under this Agreement and will indicate the nature and status of those undertakings. The report shall also summarize actions taken to implement the terms of this Agreement and propose any recommendations for its implementation over the coming year including any suggestions to modify or amend it. Within the report, the Air Force Reserve shall also reassess the provisions of Appendix B and C to ensure that they continue to address the Agreement's goals and objectives. The parties may elect to review and discuss this written report at a meeting and the Air Force Reserve shall meet with any party to this agreement who so requests.
- 7. If any party to this Agreement determines that its terms cannot be met or believes an amendment or addendum necessary, that party shall immediately request the consulting parties to consider an amendment or addendum to the Agreement. Such amendment or addendum shall be executed in the same manner as the original Agreement. No amendment or addendum to this Agreement will go into effect without written concurrence of all consulting parties.
- 8. Any party to this Programmatic Agreement may terminate it by providing thirty (30) calendar days notice to the other parties, provided that the parties will consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination. In the event of termination, the Air Force Reserve will comply with 36 CFR sections 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.
- 9. Should the SHPO or the Council object within thirty (30) calendar days to any actions pursuant to this Agreement, the Air Force Reserve shall consult with the objecting party to resolve the objection. If the Air Force Reserve determines that the objection cannot be resolved, the Air Force Reserve shall request the further comments of the Council pursuant to 36 CFR 800.6(b). The Council will provide comments within thirty (30) days of receipt of adequate documentation.

Any Council comment provided in response to such a request shall be taken into account by the Air Force Reserve in accordance with 36 CFR 800.6(c)(2) with responsibility to carry out all actions identified under this Agreement that are not the subject of the dispute will remain unchanged.

10. In the event the Air Force Reserve does not carry out the terms of this Programmatic Agreement, the Air Force will comply with 36 CFR sections 800.4 through 800.6 with regard to individual undertakings covered by this Programmatic Agreement.

Execution and implementation of this Programmatic Agreement evidences that the Air Force Reserve has satisfied its Section 106 responsibilities for all individual undertakings of the program.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

BY:

-m:41 - .

Fowler, Executive Director

DATE:

UNITED STATES AIR FORCE RESERVE

BY:___

Title: Commander, 452d Air Mobility Wing

DATE: 14 Jan 98

CALIFORNIA STATE HISTORIC PRESERVATION OFFICER

BY

Title

)ATE:

APPENDIX A DEFINITION OF TERMS USED IN THIS AGREEMENT

In addition to the terms defined here, and unless otherwise indicated, all definitions given in 36 CFR 800.2 will be accepted for the purpose of this agreement.

- 1. <u>Routine maintenance</u>: Routine maintenance will include interior and exterior maintenance and repair.
- 2. <u>Maintenance</u>: Maintenance in the recurring day-to-day or periodic work required to continue current use of a facility. It includes work undertaken to prevent damage or deterioration.
- 3. <u>Repair</u>: Repair includes overhauling, refinishing or reprocessing constituent parts or material of a facility in order to continue effective current use. It includes replacement in kind when new materials and design match existing materials and design.

APPENDIX B ACTIONS NOT REQUIRING FURTHER CONSULTATION

The following activities do not require further consultation with the SHPO or Council when carried out in accordance with the *Maintenance Manual for Buildings within the March Field Historic District, March Air Reserve Base, Riverside, California*, dated November 1995 (Appendix C).

A. Structural Elements

- 1. Repair or replacement of trim, or hardware when done in kind to match existing material and design.
- 2. Replacement of glass when done in kind to match existing material and design. Window panes may be double or triple glazed as long as the glazing is clear and replacement does not alter existing window material and form. This excludes the use of tinted glass, which will require consultation.
- 3. Maintenance of features such as frames, paneled or decorated jambs and moldings through appropriate surface treatments such as cleaning, rust removal, paint removal, and re-application of protective coating systems,
- 4. Repair or replacement of doors, when done in kind to match existing material and form.
- 5. Repair or replacement of roofs or parts of a roof that are deteriorated, when done in kind to match existing material and design. Adequate anchorage for roofing material to guard against wind damage and moisture penetration shall be provided.
- 6. Repair or replacement of gutters and drain pipes, when done in kind to match existing material and design.
- 7. Repair or replacement of porches and stairs when done in kind to match existing material and design.

- 8. Repair of window and door frames by patching, splicing, consolidating, or otherwise reinforcing or replacing in kind those parts that are either extensively deteriorated or are missing. The same configuration of panes will be retained.
- 9. Repair or replacement of window and door screens when done in kind to match existing material and design.
- 10. Alteration, repair and/or modification of the interior of buildings, not impacting on exterior appearance.
- 11. Demolition of non-contributing buildings within the Historic District boundaries that have been evaluated within the last five (5) years and found to be non-contributing elements of the District.

B. Surfaces

- 1. Painting exterior surfaces when the new paint matches the existing or original color. As all eligible buildings within the District are stucco, standard methods of re-surfacing are allowed.
- 2. Replacement or installation of caulking and weather-stripping around windows, doors, walls, and roofs.
- 3. Removal of non-original intrusive surface applied elements such as exterior wall mounted conduit, pipes, wiring, junction boxes, etc.

C. <u>Utility Systems</u>

- 1. Installation of mechanical equipment that does not effect the exterior of the buildings.
- 2. Replacement, removal, or upgrading of electrical wiring.

D. Surrounding Features

- 1. Ongoing maintenance of immediately surrounding landscaping, including such modifications as removing diseased or safety-threatening vegetation.
- 2. Repair or replacement of street pavement, curbs, driveways and walkways done in kind to match existing materials and design.
- 3. Repair or replacement of fencing done in kind to match existing material and design.

E. New Materials

- 1. Installation of dry insulation.
- 2. Installation of security devices, including dead bolts, door locks, window latches, and door peep holes. Damage to historic doors and windows should be minimized during installation.
- 3. Installation of fire or smoke detectors.
- 4. Installation of security systems.

F. Ground Disturbing Activities

- 1. Excavations for repair or replacement of building footings or foundation work within two (2) feet of existing footings and foundations.
- 2. Installation of utilities, such as sewer, water, storm, electrical, and gas, where installation is restricted to areas previously disturbed by installation of these utilities.
- 3. Tree or shrub planting or removal in areas that have been previously disturbed by these activities.
- 4. Installation of landscape sprinkler systems.



Maintenance Manual

for Buildings within the March Field Historic District, March AFB, Riverside, California

Prepared for:

1.3 美克里兰

Army Corps of Engineers, Los Angeles District and March Air Force Base Contract No. DACA09-92-D-0011

Prepared by:

JRP Historical Consulting Services 1477 Drew Avenue, Suite 105 Davis, CA 95616

with:

ASM Affiliates, Inc. 543 Encinitas Blvd, Suite 114 Leucadia, CA 92024-0960

November 1995

The state of

.

Table of Contents

1.	Exec	utive Summary	1-1
2.	Gene	ral Comments on March Field Historic District	2-1
	2.1 2.2	Boundaries for March Field Historic District Materials and Building Types within the Historic	2-1
		District	2-2
	2.3	Care for Materials Found within the Historic District	2-2
	2.4	General Comments on Historic Integrity	2-3
	2.5	General Comments on Maintenance Concerns	2-4
	2.6	General Guidelines for Restoration Actions	2-9
	2.7	A Note on the Historic Color Palette	2-10
	2.8	Guidelines to Ensuing Sections of the Maintenance Manual	2-11
3.	Offic	er Housing	3-1
	Offic	ers' Quarters Type A	3-9
		Building 123	3-17
		Building 124	3-18
		Building 127	3-19
		Building 128	3-20
		Building 131	3-21
		Building 132	3-22
		Building 135	3-23
		Building 138 Building 141	3-24
		Building 141 Building 145	3-26
		Building 149	3-27 3-28
		Building 153	3-20
		Building 157	3-30
		Building 161	3-31
		Building 163	3-33
		Building 166	3-34
	Offic	ers' Quarters Type B	3-35
		Building 121	3-41
		Building 126	3-42
		Building 129	3-44
		Building 134	3-45
		Building 136	3-46
		Building 137	3-47
		Building 139	3-48
		Building 147	3-49
		Building 155	3-50
		Building 168	3-51

Officers' Quarters Type C	3-53
Building 125 Building 130 Building 133 Building 143 Building 151 Building 159	3-59 3-60 3-61 3-62 3-63 3-64
Officers' Quarters Type D	3-65
Building 164 · Building 167	3-73 3-74
Officers' Quarters Type E	3-75
Building 162 Building 169	3-81 3-82
Officers' Quarters Type F	3-83
Building 117 Building 118 Building 119 Building 120 Building 122 Building 140 Building 142 Building 144 Building 146 Building 150 Building 152 Building 156 Building 158 Building 160	3-93 3-94 3-96 3-97 3-98 3-99 3-100 3-101 3-102 3-103 3-105 3-106 3-107 3-108
Officers' Quarters Type G	3-109
Building 115 Building 170 Building 171 Building 172 Building 173 Building 174	3-117 3-118 3-119 3-120 3-121 3-122
Commanding Officer's Quarters	3-123
Building 176	2.122

4.	NCO Housing	4-1
	NCO Building Type A	4-7
	Building 202	4-13
	Building 203	4-14
	Building 210	4-15
	Building 211	4-16
	Building 218	4-17
	Building 219	4-18
	Building 224	4-19
	Building 225	4-20
	Building 232	4-21
	Building 233	4-23
	Building 240	4-24
	Building 241	4-25
	Building 248	4-26
	Building 249	4-27
	Building 332	4-28
	Building 337	4-29
	Building 341	4-30
	Building 345	4-31
	Building 382	4-32
	NCO Building Type B	4-33
	Building 206	4-41
	Building 207	4-42
	Building 214	4-43
	Building 215	4-44
	Building 228	4-45
	Building 229	4-46
	Building 236	4-47
	Building 237	4-48
	Building 244	4-50
	Building 245	4-51
	Building 329	4-52
	Building 334	4-53
	Building 335	4-54
	Building 339 Building 343	4-55
	building 343	4-56
	NCO Building Type C	4-57
	Building 200	4-65
	Building 201	4-66
	Building 204	4-67
	Building 205	4-68
	Building 208	4-69

	Building 209 Building 212 Building 216 Building 217 Building 220 Building 221 Building 222 Building 222 Building 222 Building 223 Building 226 Building 230 Building 230 Building 231 Building 234 Building 235 Building 238 Building 239 Building 242 Building 242 Building 243 Building 247 Building 250 Building 251 Building 251 Building 330 Building 330 Building 330 Building 338 Building 344 Building 344 Building 344	4-70 4-71 4-72 4-73 4-74 4-75 4-76 4-77 4-78 4-81 4-82 4-83 4-84 4-84 4-85 4-91 4-91 4-92 4-93 4-94 4-95 4-99 4-99 4-99 4-99 4-99 4-99
	Building 381	4-102
5.	Building 383 Garages	4-103
,.	Building 112	5-1 5-5
	Building 113 Building 116 Building 165 Building 175 Building 177 Building 178 Building 179 Building 180 Building 252 Building 253 Building 254	5-6 5-8 5-9 5-11 5-14 5-16 5-17 5-18 5-19 5-20 5-21

	Building 255 Building 256 Building 257 Building 331 Building 362 Building 364	5-22 5-24 5-25 5-26 5-27 5-28
6.	Hangers and Hanger-Like Buildings	6-1
	Building 300 Building 355 Building 373 Building 385 Building 429 Building 440 Building 452 Building 453 Building 457 Building 458	6-9 6-11 6-13 6-16 6-20 6-23 6-27 6-29 6-31
7.	Barracks (Dormitories)	7-1
	Building 311 Building 400 Building 456	7-5 7-9 7-14
8.	Warehouses	8-1
	Building 420 Building 430 Building 435 Building 441	8-5 8-9 8-11 8-14
9.	Non Repetitive Buildings	9-1
	Building 100 Building 102 Building 108 Building 148 Building 154 Building 301 Building 315 Building 317 Building 323 Building 386 Building 405 Building 406 Building 407	9-3 9-11 9-14 9-17 9-21 9-25 9-31 9-34 9-40 9-49 9-52 9-55
	Building 408	9-58

		Building 409 Building 410 Building 411 Building 412 Building 413 Building 417 Building 418 Building 431	9-59 9-60 9-63 9-66 9-69 9-73 9-77
		Building 432 Building 439 Building 463 Building 465 Building 466 Building 467 Building 470 Building 472 Building 479 Building 488 Building 497	9-82 9-85 9-88 9-90 9-93 9-104 9-114 9-117 9-120 9-121
10.	10.1	ic Landscape General Comments on Historic Landscape	10-1
	10.2 10.3	Contributing and Non-Contributing Elements General Maintenance and Restoration Considerations	10-2 10-3
	Gilley Adam: "L" St "M" S "B" St "A" S Plumm Dekay	Streetscape Streetscape s Avenue Streetscape creetscape streetscape treetscape treetscape treetscape treetscape treetscape are Avenue Streetscape er Avenue Streetscape er Avenue Streetscape	10-8 10-10 10-11 10-12 10-13 10-14 10-15 10-16 10-17
11.		ically Significant Buildings Outside the March Historic District	11-1
	11.1 11.2	General Comments on Integrity, Maintenance, and Restorative Measures Other Historic Buildings Outside the Historic District	11-1 11-1
		Building 641 Building 641A	11-3 11-7

12.	A Che Archit	12-1	
	12.1	A Maintenance Strategy: The Ground Rules	12-1
	12.2	Documentation	12-2
	12.3	Conclusions	12-8
13.	Sugge	ested Reading and Selected Bibliography	13-1

Appendix I: Index to Buildings.

Appendix II: National Park Service, Preservation Briefs.

- A. The Cleaning and Waterproof Coating of Masonry Buildings.
- B. Preservation of Historic Concrete: Problems and General Approaches.
- C. The Preservation and Repair of Historic Clay Tile Roofs.

1. Executive Summary

This Maintenance Manual was prepared by JRP Historical Consulting Services for March Air Force Base (March AFB) in conjunction with a Cultural Resources Management Plan (CRMP) for March AFB. The work was undertaken under Contract No. DACAO9-92-D-0011 with the Corps of Engineers, Los Angeles District and ASM Affiliates, Inc. of Leucadia, California. Together, the Maintenance Manual and the CRMP are designed to provide basic historic preservation guidance for decision makers at March AFB about how to treat historically significant properties at March AFB, especially those contained within the March Field Historic District. The March Field Historic District is a triangular area, bounded by the flightline, Riverside and Meyer Avenues, comprising the historical area of the base. Although the historic district comprises a small portion of the total acreage of March AFB, it includes almost all of the historically significant properties located within the base. The only buildings outside the historic district that have been determined eligible for listing in the National Register are the Red Cross Building and its associated garage on Riverside Avenue.

The CRMP and Maintenance Manual are separate documents and address different audiences. The CRMP is a planning document which provides general historic preservation guidelines and actions, addressing broader questions of how the historically significant buildings should be used, maintained, and treated, including guidance on how this historic district might be handled under base realignment.

This Maintenance Manual is much more detailed and is intended for a somewhat different audience. The general objective of the Maintenance Manual is to offer guidance on how the buildings within the historic district may be maintained in such a way as to preserve and/or restore historic integrity to the maximum extent that is practicable. The entire manual seeks to address four issues about each building and about the historic district generally. The four issues are: significance; integrity; maintenance needs; and restoration potential. Significance is the historical importance of the resource, i.e., why it deserves preservation. Integrity is the historical authenticity of the resource, i.e., what about it is historical and what is of more modern origin. Maintenance needs are simply perceived problems with a building which need to be addressed to preserve, not only the historic value but the structural integrity of the building. Restoration potential is the potential for correcting past modifications and restoring the building to more closely approximate its original appearance.

The Manual is divided into thirteen sections, including this executive summary, which is section 1. Section 2 provides general statements about the significance, integrity, maintenance needs and restoration potential for the historic district generally. Sections 3 through 9 address the buildings within the historic district by building types: NCO houses; officers quarters; garages; barracks; hangars; warehouses; and other buildings which do not fit into repetitive building types. Section 10 discusses historic landscape elements of the historic district, while Section 11 addresses maintenance concerns for Buildings 641 and 641A, the Red Cross Building and its associated garage. These two structures are the only known National Register-eligible buildings outside the historic district. An inspection and maintenance checklist for exterior architectural elements is provided in Section 12 and Section 13 contains suggestions for further reading and a selected bibliography.

The intended audience is somewhat different for Section 2 versus Section 3 through 9. Section 2 addresses general maintenance and restoration concerns and, for this reason, is more useful for long-range planning purposes. It is intended for use by management at March AFB as well as by maintenance engineers and maintenance staff, as a more general orientation to historic preservation concerns within the March Field Historic District. The later sections

offer much more specific guidance and are intended chiefly for use by maintenance engineers and maintenance staff in developing specific plans for these buildings. These later sections, however, may be useful for long-term planning as well, if decision-makers must confront plans for entire groups of buildings. This type of decision may arise, for example, under various base realignment options.

The general reader is invited to read Section 2 for a general discussion of significance, integrity, maintenance, and restoration considerations for the historic district. If the reader is interested in a particular building type -- residence, hangar, warehouse, barracks, and so forth, he or she is invited to read Section 2 followed by the front matter to the appropriate chapter. If the reader is interested in a particular building, he or she is invited to read Section 2, the front matter for the appropriate chapter, followed by the inventory form for the particular building.

2. General Comments on the March Field Historic District

The March Field Historic District is most easily appreciated when considered as a whole. It includes 228 buildings and structures, located in a triangular area of about 158 acres. Virtually all of these (199 of the 228 buildings and structures) were built between 1928 and 1943 and retain a sufficiently high degree of historical authenticity to contribute to the historic district. As with any historic district, the March Field Historic District is important because it conveys a "sense of time and place" in a way no individual building could do.

Nonetheless, the district is composed of individual, freestanding buildings and structures, each of which has its unique history and character and poses unique maintenance and preservation challenges. For this reason, this maintenance manual is built around a series of individual reports about the contributing elements of the historic district. Where appropriate, these comments are clustered to deal with repetitive buildings, such as the various building types within the residential area, the hangars, the garages, the water tanks, and so forth.

Before proceeding to these individualized building reports, however, it is worthwhile to comment on the historic district generally, focusing on four areas: materials and building types; historical integrity; maintenance and structural conditions; and possible restoration measures.

2.1 Boundaries for the Historic District

The boundaries for the March Field Historic District include a triangular area, defined in general by Meyer Drive, Riverside Drive and the rear of the buildings which abut the flightline. The regular triangle is truncated somewhat at the northwest and southeast to exclude noncontributing buildings.

The triangular plan for the March Field Historic District is itself a major aspect of the historic significance of the historic district. This plan was developed in part by George B. Ford, one of the leading early American city planners. In long range planning for the historic district, the plan -- the arrangement of buildings, open spaces, and streets -- should be regarded as the major unifying factor in the area and treated as an essential part of the significance of the entire district.

The historic district is quite self-contained and is insulated to a large degree from modern construction outside the historic district. Along Meyer and Riverside, the wide boulevards and generous plantings along the perimeter fence form clear boundaries between the historic district and the rest of the base. At the southwest, the flightline itself serves as a huge open space, shielding the historic district from new construction. New construction has intruded into the setting of the historic district only at the northwest and southeast. At the northwest, Building 423 is a massive new hangar, out of scale with the historic hangars nearby. At the southeast, World War II-era and later buildings intrude into the setting for the hangars as well as the Non-Commissioned Officer housing.

The general isolation of the historic district helps insulate it from most potential impacts arising from new construction at March AFB. Only at the northwest and southeast corners is the historic district vulnerable to secondary impacts from new construction. As discussed below, the principal threat to the integrity of the district arises from new construction within the boundaries of the district.

2.2 Materials and Building Types within the Historic District

The March Field Historic District is built around groups of repetitive building types, each of which represented a functional type (residential, industrial, hangars, and so forth), and each of which comprises a distinctive method of construction. The residential units, which account for more than half the buildings, are, with rare exceptions, built in a hollow wall concrete method. This construction method is highly unusual and is a key aspect of significance for these buildings. The hangars are steel framed buildings with concrete walls. Industrial buildings are predominantly hollow clay tile or tile brick construction.

Construction materials help to define the appearance of the buildings. The hollow concrete walls of the residences are nearly two feet thick, giving deep shadow lines at the windows and doors, one of the more handsome attributes of these buildings. The steel-framed hangars are notable for their relatively thin walls. These thin walls, combined with the great clear span interiors and generous windows, give these buildings a light and airy feeling.

Construction methods also help explain the repetitive maintenance problems for these buildings as well as predictable changes to their historic integrity. The vast hangar spaces have relatively thin metal roofs. These roofs are caught in the winds and nearly all of them leak. The thick concrete walls of the residences resist any effort to make new openings for utilities. As a consequence, the walls are laced with exterior electrical conduits. The clay tile buildings appear to be the most fragile of any building types within the historic district. The only major structural deterioration observed within the historic district concerns the hollow clay tile buildings, especially garages in the residential sector.

Maintenance engineers and maintenance staff will be well advised to acknowledge the different materials and building types within the historic district. Plans which work well for one building type may not work at all for another. In the following section, general observations are made regarding care for particular building materials found within the historic district.

2.3 Care for Materials Found within March Field Historic District

It is recognized that the various materials found within the March Field Historic District pose special problems for maintenance engineers and crews, as these materials are not commonly found in other parts of the base. These materials require special care and expertise for proper maintenance. Fortunately, a vast literature has been developed by the historic preservation community, detailing proper maintenance methods for dealing with antiquated materials. These techniques are detailed conveniently in a series of "Preservation Briefs," prepared by the U.S. Department of Interior. Specialized "briefs" detail the preferred treatment methods for all of the unusual material found within the March Field Historic District: terra cotta ornamentation, hollow clay tile walls, tile roofs, and so forth. Section 13 of this report includes a list of applicable "Preservation Briefs."

More detailed and specialized comments on the maintenance of materials at March Field are presented in Section 2.5, below. These comments address unique problems found at the March Field Historic District, problems that may not be addressed in sufficient detail in the general literature cited in Section 13.

2.4 General Comments on Historic Integrity for Historic District

In general, the historic district retains a very high degree of integrity. As used in historic preservation literature, the term, integrity, refers to historic authenticity, measured as the degree to which a property retains its historical appearance. For the March Field Historic District, the period of significance is defined as 1928 to 1943; integrity is the degree to which any given building resembles its appearance during that time period. Of the 228 buildings and structures within the so-called "triangle," 199 contribute to the historic district. At any given spot within the boundaries of this historic distinct, one is likely to be surrounded almost entirely by buildings which closely resemble their appearance during the period of significance.

Nearly all of the buildings and structures within the historic district have been used continuously since the 1928-43 period and each has been to some degree repaired, upgraded, or otherwise modified during recent years. Very few buildings, however, have been so heavily modified as to no longer contribute to the significance of the historic district.

The range of modifications is very large. The following discussion treats some of the more common causes of a loss of historical integrity.

2.4.1 Non-Conforming Additions. The few non-contributing buildings within the historic district offer instructive examples of how essential integrity may be lost. There are two basic reasons a building within the historic district is a non-contributor: it is old (1928-1943) but has been modified; or it was built after 1943. Pre-1944 buildings that are non-contributors all share one characteristic: they were expanded with non-conforming additions. If any single activity may be seen as detracting from the integrity of the historic district, it is the construction of additions which do not conform with the basic design of the original.

The impact of these additions may be seen most dramatically in Building 356. This building actually comprises two of the earliest buildings constructed at March AFB; a Parachute Building and a photographic laboratory. These buildings were joined together in 1967 with a major new 130' x 50' frame and stucco addition along Graeber Street. The impact is equally apparent in additions to Building 110, the Officers' Club. The late-1920s element of the club is virtually unrecognizable because of multiple generations of additions that have increased the original floor plan from 6,400 to 30,000 square feet. The original Officer's Club is almost completely enclosed within more recent construction. Major additions have been made to many contributing buildings as well, including Building 470, the Headquarters Building, Building 465, the gymnasium, and Building 458, a hangar-like building used for engine repair.

In planning for the future, these types of additions should be avoided except as a last resort. As these additions age and are scheduled for major repairs, they should also be considered for removal.

2.4.2 Window Replacement. Window replacement projects appear to be the single most common form of modification which has detracted from the historical authenticity of the historic district. Incompatible window replacements have occurred throughout the residential area, in the barracks, and in many office buildings, while relatively few such window replacements have occurred in the industrial and hangar sectors. These replacement windows often detract from historical integrity for two reasons: incompatible geometry and incompatible materials, often both at once. The change in appearance can be dramatic. In the barracks, for example, dozens of metal casement windows were replaced with aluminum double hung windows. Inaccurate in both geometry and materials, as well as color, these replacement windows are especially distractive because they appear in such great numbers.

2.4.3 New construction other than additions. This type of new construction results in freestanding buildings and structures in the "triangle" area. Relatively little construction of this nature has taken place through the years. Most of the new buildings and structures are quite small, such as Building 168, a small bus shelter. Very recent structures built within the historic district include a series of concrete footbridges over a storm drainage canal on Riverside and Meyer drives.

It is not possible to identify a simple rule of thumb for freestanding new construction that is as dependable as the rule of thumb for additions. Generally, it may be observed that any new construction will cause an effect. That effect may be adverse or not adverse depending upon the scale of new construction and its compatibility with historic properties. As to scale, it is quite likely that any very large new building or structure will result in an adverse effect because it almost certainly will detract from the setting for one or more of the historic properties. The historic buildings are in close quarters in the triangle area and even the few open spaces are themselves part of the original plan and are regarded as contributing elements of the historic district. Thus, a large new building will likely be treated as an adverse effect, irrespective of its compatibility with the historic qualities of the buildings.

Smaller buildings and structures may be either adverse or not adverse, depending chiefly upon the compatibility of the design. Several recent examples illustrate how small and compatible new construction may be accomplished without adverse effect to historic properties. Recently, March AFB constructed a series of small concrete footbridges over a storm drainage channel at the edges of the historic district. These small bridges replaced non-contributing elements. The bridges do not recreate a historic element of the district but do utilize a material and construction method -- reinforced concrete with rough form board finish -- that is found throughout the area. They are also small in scale and do not represent major visual intrusions. The combination of historical materials and small scale allows the bridges to blend unobtrusively into the character of the historic district. As another example, the base recently built an automobile garage in the NCO area which mimics the design of much older garages in the residential area. Although it is noticeably different from the older garages, it is quite compatible with the older design and does not pose an adverse effect. In either of these cases, an adverse effect may have occurred with a different design, one without precedent in the architectural vocabulary of the historic district.

2.5 General Comments on Maintenance Concerns within the Historic District

As will be observed in the individualized building analyses below, buildings within the historic district are generally in a very good state of repair. Maintenance problems are quite site specific, with particular building types experiencing maintenance problems unique to the construction methods, uses, renovation history, and other elements unique to those building types. A few general comments are in order, pertaining to the historic district at large.

2.5.1 The Secretary of Interior's Standards and State Historical Building Code Offer Reliable Measures for the Effect of Maintenance on Historic Values. "The Secretary of the Interior's Standards for Rehabilitation" is the measure by which all work related to historic resources is evaluated by the Federal government and the State of California. Paralleling these "Standards" is California's Historical Building Code, which governs all historic buildings, mandating reasonable alternatives to those requirements of current building codes which would negatively affect the historic fabric or the historic character of these resources. All work within the district, both on structures and on the site, should be governed by these documents.

Another valuable resource is the National Park Service's "Preservation Briefs", some three dozen leaflets dealing in a comprehensive way with specific problems related to historic resource protection and preservation. Preservation Brief No. 32, "The Mothballing of Historic Buildings," may become a particularly useful document for personnel at March AFB, in the event that base realignment removes the function and mission of some of the buildings within the historic district.

2.5.2 Unused buildings are in the greatest need of repair. Not surprisingly, buildings with no current use are in greatest need of repair and rehabilitation efforts. Outside the careful watch of building managers and the daily observations of workers, these buildings have experienced considerable deterioration due to natural elements. These unused buildings are essentially the only elements of the historic district which show signs of serious maintenance problems.

Examples of unused, deteriorated buildings include Building 143 (the historic gate house), Building 148 (the original radio hut), and the various unused pump houses. Even recently abandoned buildings, such as Building 420 (until recently, the base museum) show signs of deterioration through neglect. These buildings illustrate a pressing need to find uses for all buildings within the historic district because, quite naturally, buildings that have occupants receive much more careful attention than those that do not.

2.5.3 Accessibility Must Be Addressed but Need Not Result in Adverse Effects. The Americans with Disabilities Act (ADA) as well as California's Title 24 mandate the removal of architectural barriers to the mobility impaired. However both these mandates recognize the need to balance the goals of accessibility with the protection of the Nation's cultural legacy. For this reason, when modifications for accessibility would threaten or destroy historic materials or historic perceptions, alternative means or methods may be implemented to provide an equivalent level of accessibility. In rare and unusual cases, audio-visual representations of inaccessible experiences may be tolerated. Every effort should be made to generate the maximum levels of accessibility, stopping short only when there is a significant threat to the resource. When this happens, solutions should be sought in consultation with representatives of the disabled community.

Alternative access standards for historic buildings can be applied on an item-by-item or case-by-case basis. Guidelines have been developed by the California State Historic Building Code that facilitates access and use by the physically disabled to historic buildings open to the public, while maintaining the significant historic fabric of historic buildings. These guidelines are applied accordingly to the priorities outline in a table of alternatives that rank each option according to a declining order of preference. (Part 8, Title 24, C.C.R., Chap. 8-13)

2.5.4 Energy Efficiency Should Not Be Pursued to the Detriment of Historic Values. While everyone has a duty to contribute to the conservation of energy, historic buildings are categorically exempt from California's Energy Code. This exemption recognizes that it is never acceptable to remove historic windows - one of the most character-defining elements of any historic composition. If, as in the case of March Field, most of the windows have already been replaced; the next time wear and obsolescence brings up the question, the windows should be replaced to match the originals - some of which still exist and are noted in this report, and others which can be copied from the original drawings or old photographs.

Given the benign climate of March Field, where the difference between outside and inside temperature is only rarely more than 40 degrees; and given the double-wall construction and deep window recesses of many of the buildings, and (apart from the hangar-type and warehouse-type structures which were not intended to be centrally heated or cooled) given

the relatively small ratio of window to wall; double glazing at this installation is probably more effective at sound control than at temperature control, and should not dictate the replacement window choice.

Another energy-conservation observation: Many of the hangars and a few of the other buildings along Graeber Street are still equipped with the original, single sheet steel plate doors. Where these doors are on an unshaded southwest elevation, and opening into air conditioned spaces, the impact on energy consumption from the re-radiation of the sun's heat on these doors, is considerable. There are two preservation-sensitive ways to reduce this impact. 1) A rigid foam slab, from 3/4 to 1-1/2 inches thick, depending on circumstances, can be scribed into the interior side of the door, glued in place, then protected with fiberglass or another durable coating. This will significantly reduce the flow of heat. 2) Acceptable, although far less desirable, would be the relocation of these original doors to locations on these buildings where the interior is not climate controlled, or to locations which receive little or no direct sunlight. These vintage doors, like all original doors in the District, are historically significant and should be made serviceable rather than discarded.

It must be emphasized that the original design for March Field incorporated energy conservation as part of the building and site plan. The hollow wall concrete design of many buildings was devised specifically to reduce heat gain and loss. The dense landscaping was installed specifically to shade all residential and administrative buildings. Operable windows and transoms were installed specifically to facilitate heat ventilation and introduction of cool breezes. These historic energy conservation features worked well over the life of this historic district and must be protected for both historical and energy-conservation considerations.

- 2.5.5 Deferred Maintenance Is Inappropriate for National Register Properties. Deferred maintenance is a practice, born of scarce manpower and/or funding, and applicable to buildings with a limited lifespan. If a building outlives its usefulness before the deferred maintenance is accomplished, there is, at least to the bookkeeper, a cost saving. Deferred maintenance however, is never acceptable for structures intended to endure. Small problems almost always grow, and associated repair costs tend to grow exponentially. Since the demolition option is not appropriate for historic resources, the earlier the fix, the less costly it will be. This is especially true for situations which generate the potential for water infiltration or pest infestation.
- 2.5.6 Wrought Iron Handrails Require Immediate Attention. Throughout the historic district there are problems related to the railings embedded in porches and stairways. The basic embedment methodology made possible infiltration of moisture down the baluster and onto the buried metal strap connecting the balusters together. The result has been numerous cases of these embedded straps rusting and expanding, thus cracking and spalling the surrounding concrete. In some cases the spalling has loosened entire edges of porch floors or stairways, and in others the rusting of balusters is so severe that most of the metal cross-section has disappeared. Either of these conditions could pose a hazard to building users.

In general, an acceptable historic preservation-oriented solution is to use stainless steel anchors into the masonry. Some other possible remedies are discussed below, but they all will require the removal of the existing railing and its embedded strap, and the reconstruction of the concrete porch or stair edge. None of these solutions is easy or inexpensive, but they can be accomplished over time as the conditions of the railings dictate. For buildings intended to endure, the least costly solution, ultimately, is the solution that endures the longest.

- 1) If the condition of the embedded strap and the balusters is still good, consideration should be given to the removal, the thorough cleaning, epoxy coating and re-installation of the originals. This would be the preferred solution.
- 2) Where the rusting of the straps or balusters is beyond repair, fabricate identical new railings of stainless steel or epoxy-coated steel and replace the existing deteriorating railings as required. Painted to match the originals, this solution preserves both the original design and the feel of metal; this would be the preferred replacement solution, if replacement is necessary.
- 3) Investigate the fabrication of railings from a high-quality chemical product, such as ultra-violet inhibited rigid polyvinyl chloride, a material from which windows are now fabricated. Replacement with this non-ferrous material would eliminate the spalling problems, could be integrally colored to match the original, and could reclaim the original design and appearance.
- 4) In some locations, replacement railings have been fabricated with both top and bottom rails exposed, permitting only periodic penetration into the concrete floor, for fastening stability. This clearly reduces the number of opportunities for water infiltration into the concrete, but unless the embedded fasteners are stainless or epoxy coated steel, rusting and spalling will ultimately continue. Moreover, these replacement railings are not true to the historic design which brings each baluster into the floor or step.

Expect variations in both the color and the texture of the original concrete at each railing repair location. It is very important that the best possible match be obtained when accomplishing the repair/replacement work. It is suggested that an epoxy-cement be utilized, and that the expertise of individuals with sculptured and colored concrete experience and/or historic preservation experience be sought to insure the color and texture match.

2.5.7 Clay Building Material Requires Special Care and Should Not Be Painted. The essence of the Mission Revival style at March AFB invokes the use of concrete or stucco on wall surfaces and clay for roofing and ornamentation. The most prominent use of clay is in clay Mission tiles for roofing on most major buildings. Terra-cotta is also used in applied ornamentation on key buildings, most notably on at least the two older barracks. On the third barracks (456) and on Building 470, the ornamentation appears to be caste stone.

Terra-cotta ornamentation is less sensitive than clay tile roofing to the extent that it does not function structurally. Aesthetically, however, it is an extremely important part of the buildings to which it was applied. Most terra-cotta ornamentation has been painted, usually the same color as the adjacent concrete wall. In painting the terra-cotta, one diminishes the intended effect which is as important as the contrast between concrete walls and clay tile roofs. The contrast in texture, finish, and color is lost entirely through painting; only through careful inspection may one now determine that the ornamentation is terra cotta rather than concrete.

Terra cotta is too brittle to handle abuse well, and in doorway locations and elsewhere where traffic is a factor, one encounters many nicks and gouges. It is recognized that painting the damaged terra cotta at least does a partial job of disguising the damage; yet when painted the same color as the wall, the terra cotta loses far too much of its intended architectural impact. Ideally, all paint should be removed from the terra cotta, revealing its original color and glazed texture. Badly damaged elements should be reproduced in terra cotta if possible, or in fiberglass-reinforced concrete. Special finishes have been created to reproduce the color and

finish of terra cotta, and these should be ultimately utilized also for the touch-up work on small scale damage.

Tile roofs have rarely been painted; only Building 148 includes a painted tile roof. Most tile roofs have been adversely affected, however, by paint overspray, an avoidable problem that should be addressed in any future paint projects. By contrast, virtually all terra cotta ornamentation has been painted, typically to match the base coat of the building. This is true of all the barracks as well as the caste stone surround at the entrance to Building 470. Careful removal of this paint to reveal the intended terra cotta (or caste stone) color and glaze might prove to be one of the least expensive restoration projects that might be undertaken at the March Field Historic District.

To remove paint from roof tile, terra cotta, or caste stone use a liquid or semi-liquid (paste) paint remover. Do not sandblast, or use abrasives.

- 2.5.8 Care Must Be Taken to Ensure Viability of Attic Vents. Painting operations over the years appear to have rarely attempted to mask off the screens which provide ventilation to attics throughout the district. The paint buildup in some locations is so severe that deterioration from a lack of ventilation is a genuine threat. A routine program of screen replacement should be inaugurated, and painting contractors should be strongly warned to mask these small but functionally important openings.
- **2.5.9** Industrial Sash Throughout the Historic District Requires Special Attention. The removal of exterior paint from the glass of the thousands of industrial sash windows is, by far, the preferable long-term plan. However returning this vast amount of glass to transparency would result in significant solar gain to the large industrial and hangar buildings. Simply stripping paint from the industrial sash may not be a practical solution.

Contrasted with the solar gain burdens of clear glass is the obvious ease with which a spray-paint nozzle can erase the problem. Although not a solution to the problem of painted-over glass, a level of visual mitigation can be derived by a darkening of the paint used on the sash and the glass as compared to the paint color used on wall surfaces. This would help to at least give a measure of articulation to those vast areas of wall which were historically meant to be glazed. And even this painted-over condition, being "reversible," is by far more sensitive to the historic resource than removal of the windows.

Fortunately, for the long term, the glass <u>can</u> be reclaimed--providing light without paying a penalty in solar gain. There have been very significant advances in the technology of window film. Films can filter and/or reflect very specific frequencies of visible light as well as ultraviolet and infra-red energy. Further, adhesive technology is far advanced from that which produced peeling patchworks on windows of a generation ago. Both light control and solar gain control are now possible in a <u>durable</u> product. An added benefit, where desired, is the outstanding security from intrusion that several of these films can provide.

2.5.10 Alternative Solutions Are Needed for Blocked-Off Door and Window Openings. There are viable alternatives to blocking out exterior doors and windows, and infilling them with masonry. Doors can be closed, locked, and--if necessary--the hardware removed. If there is need for even further security, these measures can be installed <u>behind</u> the door, out of sight.

The same is true with windows. Only the most extraordinary circumstances would justify their removal. There are light, sound-control and security devices which can be installed behind the glass, which will not generate a significant adverse effect. Security film placed

on the interior face of the glass, and originally developed for embassies, is strong enough to bury an ax in it without penetrating. This is a particularly useful--and acceptable--alternative in historic resources, at those locations, like french doors, where current codes require tempered or laminated glass. Original, uneven, drawn glass is an important character-defining element of historic significance.

In those locations where circumstances permit no alternative to the loss of the window or door, the closure should continue to reveal the size and shape of the original opening, so as to retain not only a record of the original opening's location, but to permit the original intent and/or rhythm of the exterior design to remain intact. Leave the sills in place, and inset the infill by at least an inch, so that the shadow will reveal the original composition. But this is the solution of last resort. The best solution will retain the window, permitting its re-utilization in the future.

2.5.11 Pest Control. Control of Pests is an essential preservation requirement. There is little evidence of any significant pest problems within the District. Wasps were occasionally noticed, most frequently near attic vents. These vents, as well as basement and under-floor crawl space vents, should have durable screening behind their decorative or utilitarian faces. It is very important that this screening not be painted; doing so significantly limits the air flow capability, and could become the cause of excess moisture build-up in attic and under-floor spaces, resulting in dry-rot. If wasps or bees attempt to invade, contact professional help for their removal. The same is true for pigeons or swallows. Be advised that the swallow, as a migratory bird, is protected by the federal government.

Because most of the Historic District's structures are constructed of poured-in-place concrete walls, and because many of them have concrete floors as well, the West's most common destructive pest -- the termite -- does not appear to be a significant factor. There is a need for constant vigilance, however, at those buildings where their infestation can most easily occur: the Red Cross Building and its garage, the garages at the Living Quarters, and the historic bakery. The garages have wood components which are too close to the soil and, as noted under their specific headings, immediate remedial action is necessary. Based on our cursory overview, we found no overt evidence of termite infestation at either the Bakery or the Red Cross Building itself, but because they are the only significant contributors constructed of wood rather than concrete, a comprehensive annual routine inspection for termite infestation should be instituted for them, as well as for any other buildings wholly or partially constructed of wood.

2.6 General Guidelines for Restoration Actions within the Historic District

In this document, the term, restoration, refers to an action taken to restore a building to its original appearance, reversing an earlier modification. The term, "beyond compliance" is sometimes used to refer to these types of restoration projects, i.e. steps that go beyond what would ordinarily be expected under compliance with Federal historic preservation projects. It is recognized at the outset that it is unlikely that MAFB will undertake restoration projects per se. It is possible, however, that restoration objectives may be achieved, through restoration-oriented repair, through mitigation efforts, or through showcase restoration projects, such as those sometimes funded under the "Legacy" program.

2.6.1 Restoration may be achieved most effectively when modifications need to be replaced. In most instances, modifications to the buildings within the March Field Historic District occurred many years ago. Modifications were usually made to the most fragile elements of the buildings, such as windows, internal equipment and finishes, and so forth. Many of these

older modifications will themselves need to be replaced in the near future. The most inexpensive approach to restoration is simply to select replacement parts which approximate those used originally. Older modifications exist throughout the historic district: windows in Green Acres; doors throughout the industrial area; doors and windows in the dormitories; doors and windows in Buildings 100, 470, and 323 (the historic hospital). The original appearance of these elements is generally known or may be researched through use of photographs, plans, and other documents at March AFB.

Depending upon the circumstances, restoration may be no more expensive than use of more "off-the-shelf" parts. Indeed, the buildings at March Field are so unusual that essentially all replacement materials are likely to be custom-made. Even when it is more expensive to replicate the original, the "restoration cost" is restricted to the difference in cost, not the total cost between the appropriate replacement material and a less expensive, inappropriate substitute. Replacing worn-out inappropriate elements with appropriate replacement parts is by far the least expensive method of pursuing restoration of the historic district.

- 2.6.2 Restoration activities may be included as mitigation for other needed modifications. This strategy is of limited utility but may be appropriate for instances in which it is necessary to offset unavoidable adverse effects. If, for example, it were necessary to build an addition to a contributing building, the adverse effect of the addition might be partially offset, or mitigated, through restoration of original features elsewhere on the same building. This type of mitigation strategy is commonly used in the review of projects that use Federal historic preservation tax incentives. In these circumstances, the project is evaluated as a total package, with the necessary modernizing elements balanced against efforts to restore lost architectural elements. March AFB could adopt this general strategy by coupling restoration projects with its on-going program to upgrade the buildings, with an eye toward balancing an adverse impact with restoration measures resulting in a "no net loss" approach to preservation of the historic district.
- 2.6.3 Restoration activities that focus upon high visibility, "showcase" buildings. If March AFB were to decide upon pro-active, beyond compliance restoration work, it should resolve to focus its activities on those buildings which would yield the best results. Some buildings within the historic district are more important than others in their capacity to convey the sense of the original March Field. These buildings are also generally the most visible, ensuring that restoration work there would be available for the general public as well. Building 100, for example, is a large, elegant, and strategically situated building that also serves many persons visiting the base for the first time. While the basic outline of the building is intact, it has lost a great deal through window replacements, wall enclosures, and interior renovations. "Beyond compliance" efforts at Building 100 would probably do more to restore the character of the historic district than any other action that might be taken.

Other buildings that might be considered for "showcase" type restoration work include the barracks (because of their high visibility), Building 470 (because of its important function and key location), and Building 323 (also a very large and elegant building that is strategically situated).

2.7 A Note on Historic Color Palette

No spraying or sanding studies have been undertaken to determine the original paint colors on historic buildings at March AFB. Historically appropriate paint colors are those that were available and considered appropriate during the period of significance, i.e. 1928-1943. The colors most strongly associate with Mission and Spanish Revival architecture were based on the natural building materials and vegetable dye paints of the original Spanish Colonial

builders. Among the more favored colors were earth tones, sandstone, beige, ocre, red clay, dark greens, Indian red, burnt orange, whitewash, and salmon.

Archival evidence from the General Correspondence files of the Quartermaster Corp in the National Archives provides information on the historical paint palette on a select group of building types within the officers' quarters. (Building Types A-E, inclusive.) Contract records and office correspondences relating to other buildings merely provides that the paint color be approved by the base quartermaster before application. The historic paint pallette for Officer Quarters Type A-E is summarized below in Table 1.

Table 1. Color Palette: Officer Quarters Type A-E

Building Type	Stucco Tint	Wood Trim	Front Door	Interior Walls	Interior Trim
TYPE A	Buff	Burnt Turkey Umber	Antwerp Blue	Light Buff	Ivory Cream (cafe au lait) enamel; or fumed oak, if stained
TYPE B	Natural Cement Wash	Burnt Turkey Umber	Cobalt or Bulletin Blue	Light Buff	Ivory Cream (cafe au lait) enamel; or fumed oak, if stained
TYPE C	White	Burnt Turkey Umber	Copper Verde Blue	Light Buff	Ivory Cream (cafe au lait) enamel; or fumed oak, if stained
TYPE D	Buff	Burnt Turkey Umber	Antwerp Blue	Light Buff	Ivory Cream (cafe au lait) enamel; or fumed oak, if stained
TYPE E	Natural Cement Wash	Burnt Turkey Umber	Cobalt or Bulletin Blue	Light Buff	Ivory Cream (cafe au lait) enamel; or fumed oak, if stained

2.8 Guide to Ensuing Sections of the Maintenance Manual

In Sections 3 through 9 below, the buildings within the March Field Historic District are discussed individually and, where appropriate, by groups of structurally similar buildings. Section 3 concerns the 57 Officers' Quarters, Section 4 the 73 NCO Quarters, Section 5 the 18 garages, and Section 6 the eight hangars and two hangar-like buildings. Section 7 deals with three barracks and Section 8 with four structurally similar warehouse buildings. Section

9 deals with the remaining 33 historic buildings within the historic district which cannot be grouped by structural type. The historic landscape of the district is discussed in Section 10. Finally, Section 11 deals with the Red Cross Building and its associated garage.

The decision was made to discuss buildings by type as opposed to discussing them in ascending numerical order by building number, simply because the comments from one building to the next within a given type are so repetitive. To allow for ease of use, references to individual buildings are listed in the attached Appendix I "index to buildings." In addition, the building numbers for each section are listed clearly at the beginning of each section.

References to technical leaflets that provide useful information on how to treat historic building materials can be found in Appendix II.

3. Officer Housing

Buildings Treated in This Section (by Building Number):

115, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 166, 167, 168, 169, 170, 171, 172, 173, 174, 176

3.1 General comments on integrity, maintenance, and restoration measures for Officers' Housing units

The March Field Historic District includes 57 single-family residences for married commissioned officers. The Officers' Quarters represent a very key element of the historic district. While fewer in number, the Officers' Quarters are much more varied than the adjacent NCO Quarters. The NCO Quarters include only three basic models, while the Officers' Quarters include seven -- identified as A, B, C, D, E, F, and G. (It must be emphasized that the NCO models A, B, and C are quite different from the Officers' Quarters with the same designation. In this discussion, the models are identified as NCO A or Officers' Quarters A to avoid any confusion.) The seven Officers' Quarters types are distinctly different in plan and elevation, although types A and B and types D, E, F, and G are similar, one to another. Obviously, there are simply fewer examples of each type within the Officers' Quarters than is the case with the NCO housing types. For example, there are only two each of the D and E types. The Officers' Quarters sector actually includes an eighth distinct type -- the commanding officers' house -- which is unique. The form for this house (Building No. 176) is included at the end of this section. Because there so many variations in the types of buildings, it is possible to make only a few general comments which apply to the residences as a group.

The Officers' Quarters were built in two distinct phases, with types A through E built in 1929 and types F and G in 1931. The 1929 houses are of hollow wall concrete construction and originally had wooden casement windows. Types F and G were built of hollow clay tile with eight-light steel casement sash, topped with a four-light transom. As noted earlier, the building types may be grouped according to plan. Types A and B are predominantly linear and quite similar to each other. Type C is rectangular and is the smallest of all the types. Types D, E, F, and G are H-shaped, with a long transverse section and front-facing wings at either side. The commanding officers' house is unlike any other, although it most closely resembles the E type building, being a hollow wall concrete building with a basic H-shaped plan.

Historic photographs of the various types of Officers' Quarters are available in records held by the MAFB historian's office. Interior views of the quarters are quite rare, the exception being the quarters occupied by Captain Ira Eaker in the mid-1930s. These views of the dining room, living room, and bedroom provide good documentation for original architectural details of the officers' residences. (Photographs 3.1 through 3.4)

The arrangement of Officers' Quarters does not follow the courtyard plan used with the NCO houses, although it is possible to discern patterns to the arrangement. Types A and B buildings are clustered, as are type F and G. This arrangement, however, has more to do with the sequence in which the buildings were constructed than with a formal courtyard plan. The larger residences -- types D, E, F, and G -- include rear patios which bring landscaping

elements into the structural shell of the building. These garden gates and patios are treated as part of the structural elements of the buildings and are discussed in the attached individual building forms.

In terms of maintenance considerations, the Officers' Quarters share several common problems: misaligned or missing roof tiles; intrusive landscaping, especially large trees growing immediately adjacent to homes; some instances of rusted front rails and spalling porch concrete; inoperable attic vents; and some instances of foundation vents below grade.

In terms of restoration measures for the Officers' Quarters, four maintenance projects could yield great restoration benefits: removing dropped ceilings in kitchens and baths; removing carpeting from hardwood floors; replacing inappropriate windows; and removing recently-installed patio covers. These actions are treated as maintenance considerations because all of these materials -- acoustical tiles in kitchens and baths, carpets, patio covers, and windows -- will need to be replaced in the near future.

The hardwood floors in the Officers' Quarters is exposed in a few buildings and appears to be in very good condition. This elegant surface could be exposed and refinished inexpensively, yielding a high preservation value at little cost. Similarly, removal of acoustical tile in the kitchen and baths would easily and inexpensively restore the intended appearance of a substantial proportion of the square footage of these buildings, at little cost in money or utility. Restoring the windows will be more expensive and should be considered only when the existing windows wear out. The restoration expense in this case is simply the <u>additional</u> cost of using windows which approximate the original steel casements. Removing patio covers would be very inexpensive, although it would have a cost in terms of covered space for the affected houses.

Other "beyond compliance" type actions that might be considered include: removing paint from the hardwood interior doors (this has been done in a few Officers' Quarters with dramatic effect); consideration of rebuilding the handsome original kitchen and bath cabinetry (plans for these exist on base); and replacing aluminum screen doors with wood.

3.2 Contributing Elements of the Officers' Quarters Area

57 Quarters. The road system and sidwalks within the Officers' Quarters area define the geometrically complex plan for the historic district and are considered contributing elements. The landscape plan with its broad expanses of lawn and tree lined streets closely approximates the landscaping that has prevailed in this area since the 1930s.

3.3 Non-Contributing Elements of the Officers' Quarters Area

See individual building forms; none for the area generally.

3.4 Maintenance Considerations for Officers' Quarters Area

All the Officers' Quarters were built at approximately the same time and many of the maintenance and modifications have been authorized for the Officers' Quarters housing as a group. The condition of the houses is uniformly quite good. It is important to note that all the residents we met during the site inventory period were very pleased with their houses. They all seemed to recognize the buildings' historic value and also very much valued the landscaping.

It should be noted that this review is limited to historic items and is not intended as an inspection of health, safety, structural and building code issues. Since the buildings are relatively old, a review of that type is advisable.

A number of maintenance concerns were observed within the Officers' Quarters area.

Repair roof tiles: Perhaps the highest priority consideration for these houses is to care for the tile roofs. While the tiles generally are in good condition, most of the houses have broken, missing or displaced tiles which will eventually lead to degradation of structural elements and interior finishes. Since the tiles are clay, they are very difficult to clean where paint overspray occurs. Painting contracts need specifications that do not allow paint on adjacent surfaces and limit spraying during windy conditions. Field review of on-going work is necessary.

Remove intrusive landscaping: A second general consideration is to remove landscaping, especially volunteer palm trees, that are growing directly adjacent to house walls. The wood roof overhangs and especially the noted copper gutters can be damaged by the fast-growing palms. (Replacement of the copper gutters and downspouts may be quite costly today.)

Repair cracked concrete walls: Where concrete walls are noted as having cracks and/or steel reinforcing bars exposed, these items may seem minor when viewed on site. The concern is for the structural integrity of the walls. If water is able to penetrate into the walls and rust out the steel reinforcing, the walls will lose their tensile strength and may be damaged under high winds or earthquake stresses. Epoxy cement filler specifically formulated for filling narrow cracks is advised.

<u>Install GFI electrical outlet</u>: Some exterior electrical receptacles appear to be lacking a "ground fault interrupting circuit." This is a safety hazard and does not comply with current codes. This may apply to interior kitchen and bath locations as well.

Repair and clean attic vents: Attic vent screens on many of the houses are either missing, torn, or are painted nearly solid so as to limit air circulation. Attic air circulation aids in summer cooling and limits the build-up of moisture that may cause dry rot in winter. The lack of screens can allow birds and other animals to nest in the attic causing unsanitary conditions.

Repair rusted front rails, spalling concrete on porches: This problem is much more acute in the NCO area but does occur in some Officers' Quarters. These railings were installed with a horizontal bar embedded just below the surface of the concrete. If the rails are allowed to rust, the rust expands to that horizontal bar, causing discoloration and ultimately to spalling of the concrete.

<u>Ensure foundation vents are water-safe</u>: At some houses, foundation vents are close to ground level, potentially allowing storm water to enter the crawl space. One remedy would be to provide a low retaining wall just above ground level (so as not to alter the visual/historic character of the houses) and provide a dry well on the house side of the low wall. This strategy should be verified, sized, and detailed by a soils engineer.

Ensure operable casement windows: Another item of note is that many of the residents seem to be closing their casement windows without properly operating the latch. While this has an impact on heating and cooling costs, the more serous consequence may be rain penetration to the interior spaces. With so many of the houses unoccupied during the daytime, rainwater could come into the house for a number of hours before it is discovered. A simple note regarding this in the base newsletter may avoid damage to interior finishes.

3.5 Energy Considerations for Officers' Quarters Area

Energy conservation versus historic preservation: When it is necessary to replace any building component which has both an energy use and visual/historic impact, it should be a standard procedure to review a series of alternative strategies by preparing a computer simulation of the thermal performance and energy use costs of the house. For example, when replacing windows, which have a very significant influence on energy costs, the performance of the house(s) with different window options can be modeled for the Riverside climate. Both single and insulated (double) glazing payback can be studied with an inflation factor built in for increasing energy costs over time. The size and appearance of steel window frames and muntin bars can be significantly different for single and insulated glazing; this difference has historic preservation consequences. (Yet all new windows would have weatherstripping, a significant improvement over the existing unweather-stripped metal windows.)

In doing such an analysis the goal is to help quantify the benefits (energy savings) and costs (additional initial cost plus historic implications) of a building modification in the mild Riverside climate. To be thorough, the analysis should look at a single component, such as the windows in the above example, in the context of other alternative energy strategies. Added attic insulation, as another example, may be much more cost effective and less visually intrusive than insulated glazing. (One attic we entered had only about one inch of rock wool insulation.) Other options to consider in the hot summer, mild winter Riverside climate includes interior summer window shading with reflective insulating blinds or draperies; radiant barriers on the underside of the attic rafters; higher efficiency, insulated (or tankless) water heaters; higher efficiency heating and cooling systems; and under floor insulation.

This is an inexpensive task, and since there are so few different types of houses, this is an extremely cost effective procedure. The cost to study a number of options is also very minor once the building characteristics are entered into the program. After the chosen strategies are installed, some, preferably unoccupied houses could be monitored and compared to prior utility bills to verify the accuracy of the results. (Many California utility companies have grant programs to fund studies such as this.) Finally, it must be noted that historic buildings are categorically exempt from the California Energy Code.

3.6 Potential Restoration Projects within Officers' Quarters Area

In terms of restoration projects, three maintenance projects could yield great restoration benefits: removing dropped ceilings in kitchens and baths; replacing inappropriate windows; and restoring hardwood floors. These actions are treated as maintenance considerations because all of these materials -- acoustical tiles in kitchens and baths, carpeting, and windows -- will need to be replaced in the near future.

The removal of acoustical tile in the kitchen and baths would easily and inexpensively restore the intended appearance of a substantial proportion of the square footage of these buildings, at little cost in money or utility. Restoring the windows will be more expensive and should be considered only when the existing windows wear out. The restoration expense in the case is simply the <u>additional</u> cost of using windows which approximate the original steel casements. Restoring hardwood floors may or not be expensive, depending upon the extent to which the original floors were damaged during installation of parquet and/or carpeting.

<u>Potential restoration project with the Officers' Quarters area</u>: The residents of the Officers' Quarters housing are quite positive about their homes including such general factors as the site planning and landscaping, the thermal performance of the houses in the hot months and the historic detailing.

Given that the future of the housing area is uncertain, it may be possible to take advantage of the historic interest of current residents and/or future owners. The first step would be to make available to the residents copies of historic drawings (and possibly summaries of our report) to enhance recognition of, and preservation of historic features.

A further step would be to provide opportunities for housing owners to restore various renovations to "original" conditions. This could be made much more affordable by having contractors provide itemized cost packages to all the owners, thereby giving the owners the ability to choose which items would best serve their individual needs, yet assure that the detailing would be kept reasonably close to original conditions. The primary options for this include:

- Replacement of the existing exterior heating and cooling units and water heaters with smaller units primarily located in interior spaces; the original heaters are in the sub-floor crawl spaces. (See energy section for more discussion of this.)
- Removal, as noted, of the suspended ceilings in kitchens and baths, thereby raising them to former heights. (If there is a concern for retaining current lighting levels with high ceilings, suspended light fixtures can be used to bring the light down closer to work surfaces.)
- Removal of some floor coverings to expose the original hardwood.
- Rebuilding the handsome original kitchen and bath cabinetry, dressers, and shelves. (See **Figures** 2 through 6.)
- Replacement of aluminum screen doors with reproductions of original wooden screens. Many original wooden screen doors are in place to serve as models.
- Removal of patio covers. Permanent patio covers have been installed on some houses, particularly in the Type A and B houses. These could be removed, as noted, at little dollar cost, although a cost would be incurred to the resident in terms of covered space. It should be emphasized, however, that the newer patio covers in the A and B types are non-contributing elements to the historic district, while the ca. 1935 covers in the F and G models are contributing elements.

Another consideration is to provide a checklist of items to review when houses change occupants. The list could include floor finishes, suspended ceilings, etc. Obviously the best time to do restoration work is when the houses are unoccupied.

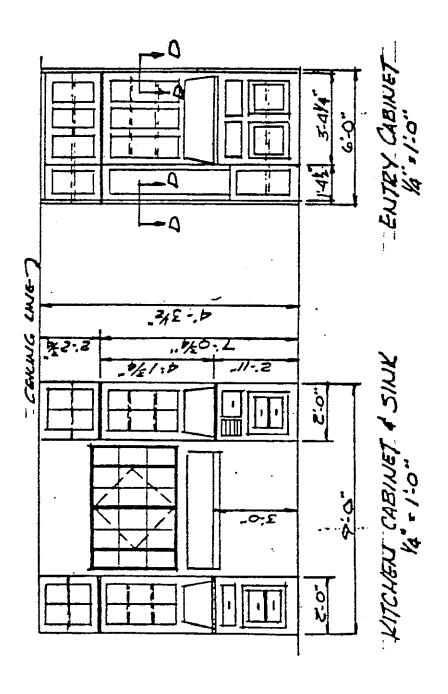


Figure 2

Historic design plan of Entry Cabinet and Kitchen Cabinet and Sink for Company Officers' Quarters Type F-1. November 1932.

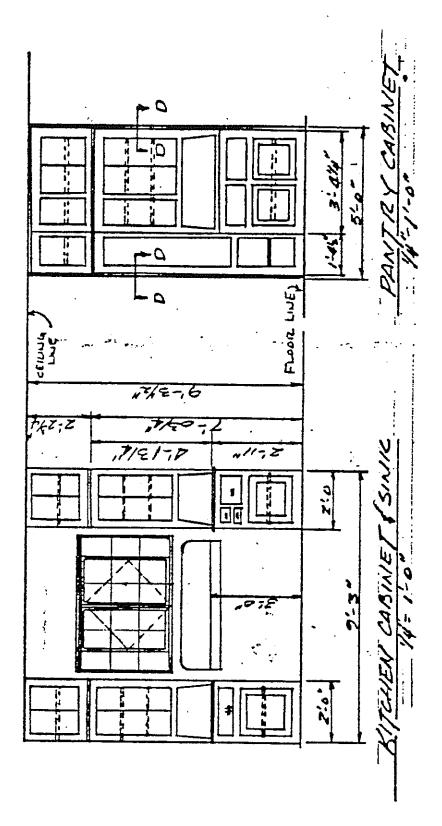
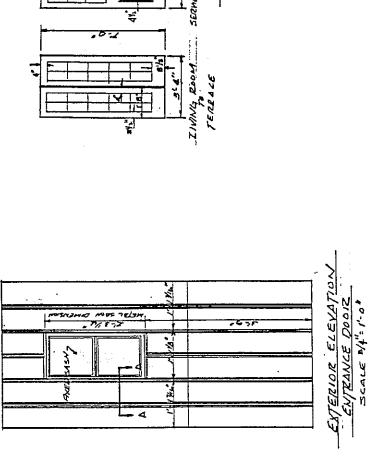


Figure 3

Historic design plan of Pantry Cabinet and Kitchen Cabinet and Sink for Company O()rs' Quarters Type F-1 and F-2. February 1931.



LUNGA CLOSE 4.0 Karues SCALE: 14". - Zood TERESCE TOOK

Figure 4

Historic design plan of Entrance Door and Door Schedule for Company Officers' Quarters Type F-1 and F-2. February 1931.

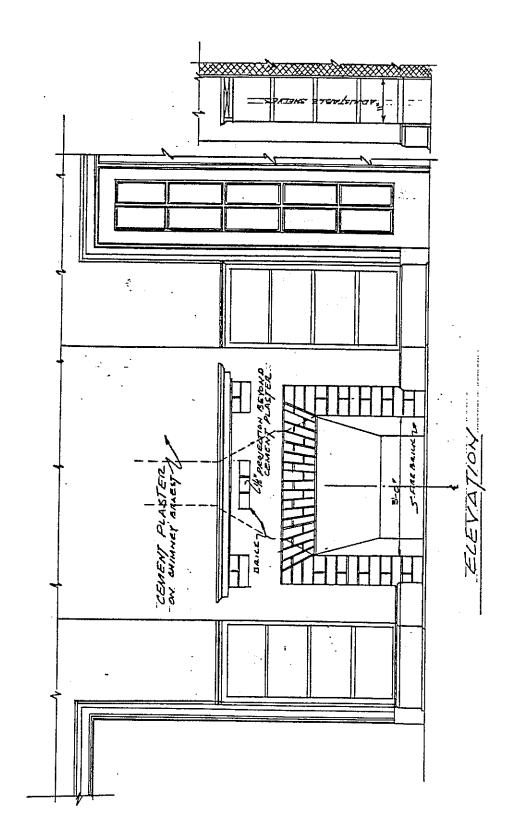


Figure 5

Historic design plan of the fireplace and its adjustable shelves for Company Officers' arters Type F-1 and F-2. February 1931.

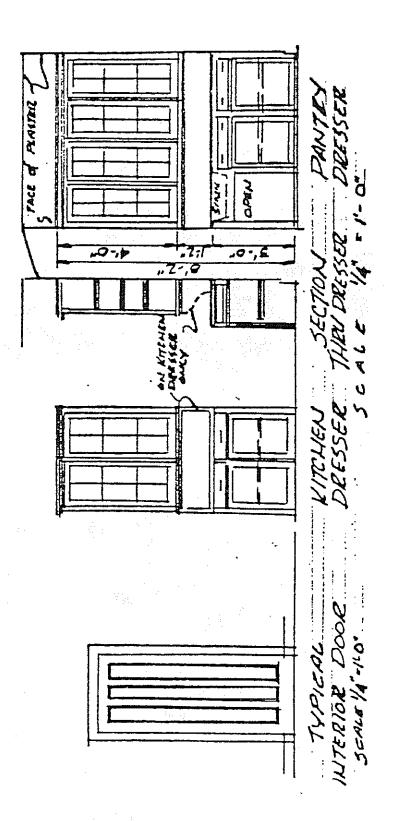
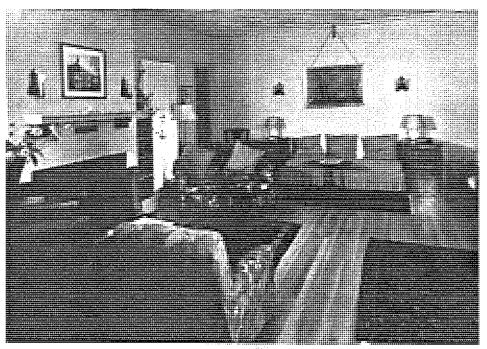
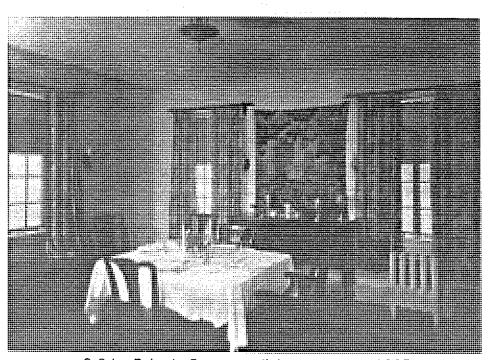


Figure 6

Historic design plan of Typical Interior Door, Kitchen Dresser, and Pantry Dresser for Company Officers' Bungalow Type C-2. February 1928.



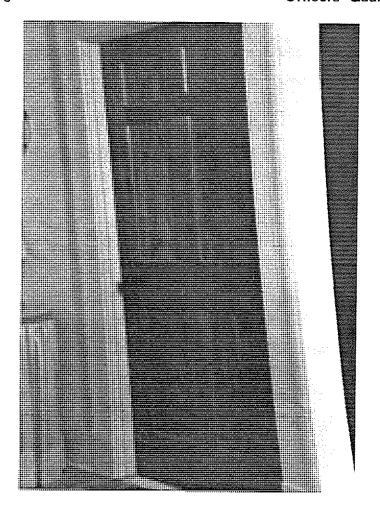
3.1 Ira Eaker's Quarters, living room, ca. 1935.



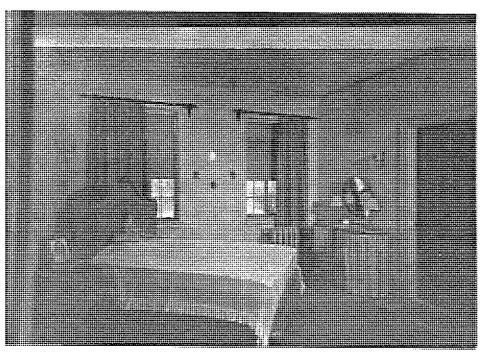
3.2 Ira Eaker's Quarters, dining room, ca. 1935.

Selected Photographs of Building Detail

Officers' Quarters



3.3 Ira Eaker's Quarters, bedroom door detail, ca. 1935.



3.4 Ira Eaker's Quarters, bedroom, ca. 1935.

Officers' Quarters Type A

Historical Use: Officer Family Housing Current Use: Officer Family Housing

Date Constructed: 1929-31 Area: 1604 sf

2. Historical and Architectural Significance

The Officers' Quarters Type A home is one of the original building types built in the early years of construction at March AFB. There are 16 OQ Type A residences at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition

Description: Officers' Quarters Type A is a 1604 sf single story residence, built for occupancy by field grade officers. It is a standard type for March AFB, sometimes designated by subtypes A-1 and A-2. The Type A building is a one-story hollow-wall concrete residence with a Mission tile side gabled roof. It is distinguished by a cross gable front extension and a small open porch at one end. As with most homes in the officers quarters sector, there are A-1 and A-2 variations, distinguished by the location of the front gable bedroom extension, right for A-1 and left for A-2, and the location of a rear kitchen, located opposite the bedroom extension. The A building is an attractive example of Mission Revival design. It is a linear design, particularly at the facade. Its fenestration offers a pleasing mix of forms, from the balconied rectangular openings with French doors to the arched openings at the side porches (**Photograph 3.5**). The Officers' Quarters Types A and B are quite similar and generally appear next to one another in a courtyard pattern. This courtyard pattern is much less formal, however, than occurs in the NCO area.

The Type A building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: a balcony with steel rails and French doors opening from the living room; the original fireplace, mantle, and adjoining bookcases; built-in sideboard; a convex opening into the living room; a front porch with paving tiles; and decorative rafter tails and brackets. There are few major intrusions into this historical integrity, the most notable being the replacement of the original wooden casement windows with aluminum casements; a dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet.

General Condition: See Officers' Quarters summary for a description of the general condition of the buildings.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Large round vents in gable ends * Arched wooden front door * Arched front screen door (some with grills over small window) * Copper gutters and downspouts (gutter behind beam, front porch) * Porch door * Paving tiles in porch * Concrete splash guard * Front porch roof brackets and beam * Scalloped rafter tails * Square hole foundation vents * Exterior doors and windows with moulding * Living room balcony and railing * Six-lite, one panel rear door * Ten-lite French doors at balcony * Steel rail at rear porch	* Brick fireplace, tile hearth * Wood mantle * Built-in shelves by fireplace * Built-in sideboard, dining room * Built-in telephone niche * Plaster ceilings, except kitchen and bath * Three-panel interior doors, two-panel at narrow closet doors * Picture moulding * Convex composite doorway to living room * Oak flooring in closet * Attic access door * Base trim and door trim * Trim detail at passage from dining to living room

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * Wooden porch enclosure (common) * Fiberglass porch roof (common) * HV/AC unit and water heater * Concrete cover for foundation vents * Bathroom window sealed off * Kitchen window sealed off * Aluminum screen doors * Miscellaneous television antenna brackets	* Dropped acoustic tile ceilings in kitchen and bath * Removal of wall of "maid's room," to create a family room * Kitchen, bath and family room cabinets * Kitchen appliances and fixtures * Non-historic parquet floor covering * Parquet flooring (common) * Carpeting (common) * HV/AC floor grills

5. Maintenance Considerations:

See individual building forms.

6. Possible Restoration/Enhancement Measures: Officers' Quarters Type A

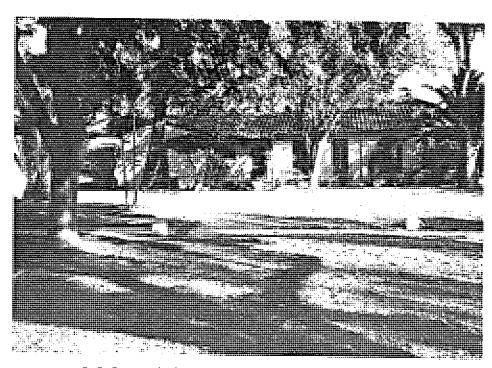
As discussed earlier, the historical integrity is generally very high for the A buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters A type buildings, four non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath; and temporary porch roof covers. As these items are replaced, every effort should be made to replicate or approximate the original design. Screened porch enclosures and temporary roof covers exist throughout the Officers' Quarters but are most common with the A and B models. As they deteriorate, they should be removed. Alternatively, the base could develop a uniform design for these items, based upon historical precedents in the historical district, such as the terrace enclosures ("lanais") in the F and G models.

Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with steel or wooden casements. The A Type originally featured wooden casements. Models still exist for both the steel and wooden casements. Steel casement windows exist in smaller utility buildings, including the pump houses. Wooden casements may be seen at the Officers' Club (Building 110).
- 3. Restoration of hardwood floors as carpeting or parquet flooring deteriorate.
- 4. Remove temporary patio covers as they deteriorate; replace only with uniform model based upon historical precedent.
- 5. Replace aluminum screen doors with wooden screen doors.



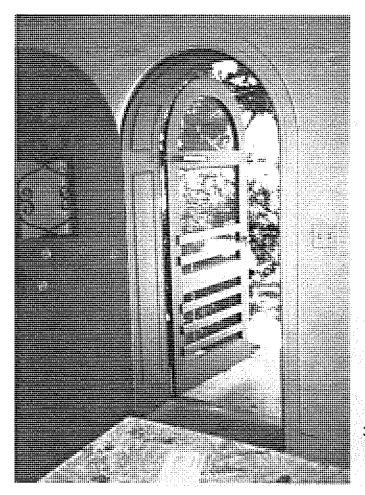
3.5 Type A Officers' Quarters, 1929.



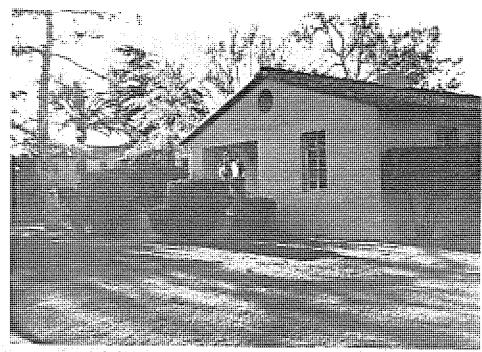
3.6 General view of Officers' Quarters, Type A.

Selected Photographs of Building Detail

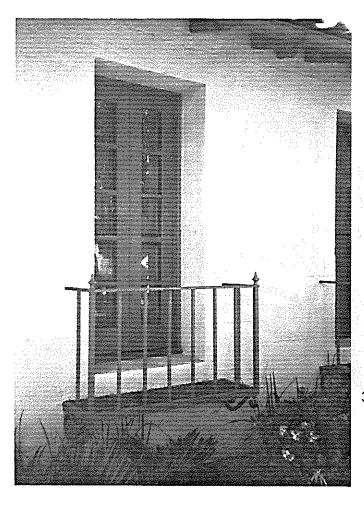
OQ Building Type A



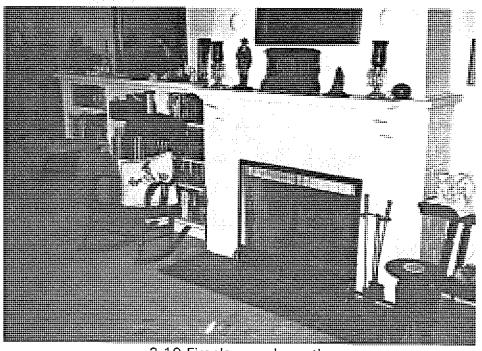
3.7 Arched entry door and screen.



3.8 Side porch, arched and squared openings.



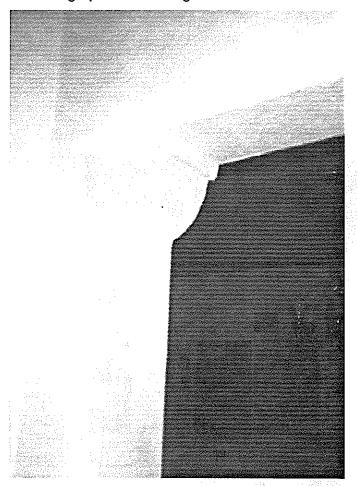
3.9 Living room balcony and french doors.



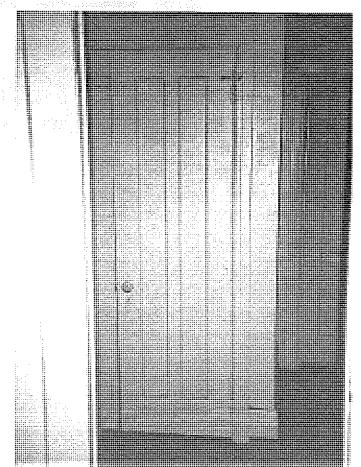
3.10 Fireplace and mantle.

Selected Photographs of Building Detail

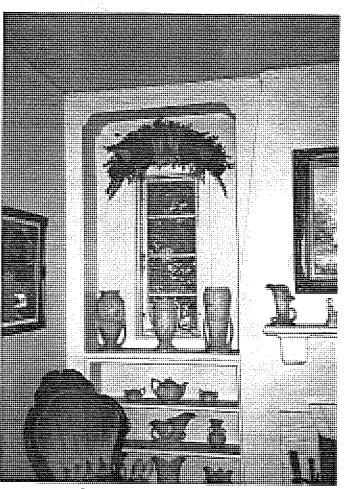
OQ Building Type A



3.11 Convex moulding between living room and dining room.



3.12 Vertical panel interior doors.



3.13 Living room alcove.

Historical Use: Field Grade Officer Family Housing

Building: 123 (OQ Type A)

Building No.: 123 Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition: See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The aluminum screen doors on the side and rear porches are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Paint overspray on roof tile
- * Broken roof tile
- * Front downspout displaced
- * Foundation vents plugged
- * Paint overspray, side terrace tile floor
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Replace aluminum screen doors with wooden screen doors.

Building: 124 (OQ Type A)

1. Basic Building Data

Building No.: 124 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Area: 1604 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type A Buildings

3. Building Description/Condition: See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The fiberglass porch roof and wooden porch enclosure are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

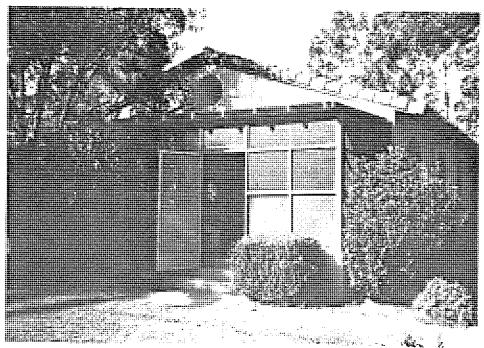
- * Too much paint on attic vent
- * Foundation vent screen missing
- * Antenna straps on chimney
- * Roof tile broken

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

- a. Remove fiberglass porch roof.
- b. Remove interior sliding door.

Selected Photograph of Building Detail



3.14 Wooden enclosure at porch.

Building No.: 127 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 127 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

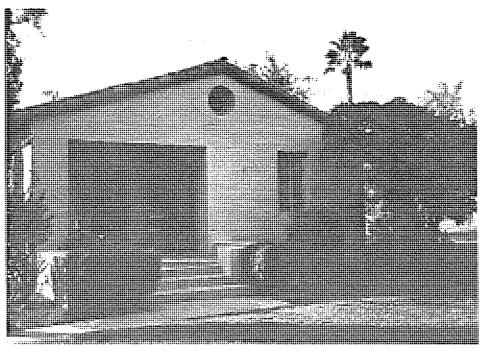
See general form for OQ Type A Buildings. The television antenna straps on the chimney and wooden brackets on rear wall are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken, missing, and displaced roof tile
- * Plant growing against building wall
- Possible Restoration/Enhancement Measures:
 Unique to this building. See general form for OQ Type A Buildings.
 - a. Remove miscellaneous exterior brackets.

Selected Photograph of Building Detail



3.15 Front porch.

Building No.: 128 Historical Use: Field Grade Officer Family Housing
Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 128 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings.

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Partially screened-in side porch with aluminum screen door * Metal bracket and wiring at both round, gable end attic vents * Aluminum screen door at rear porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken and missing roof tile
- * Paint overspray on roof tile
- * Foundation and attic vent screens missing
- * Splash block missing, and downspout partially buried at left front

6. Possible Restoration/Enhancement Measures:

- a. Remove porch enclosures.
- b. Remove miscellaneous items at attic vents.

Building No.: 131 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 131 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Hose rack added to steel rail at balcony * Partially screened side porch * Aluminum screen door at rear porch and side porch doors	·

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Many broken and missing roof tile
- * Foundation vents plugged or missing
- * Rear porch concrete spalling at steps
- * Paint on side porch light fixture

6. Possible Restoration/Enhancement Measures:

- a. Remove porch screening.
- b. Remove balcony hose rack.

Building: 132 (OQ Type A)

Building No.: 132

Date Constructed: 1929

Area: 1604 sq. ft.

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Metal straps on chimney * Partially screened side porch * Replacement rear screen door * Wood bracket projecting from round, gable end attic vent	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken and missing roof tile
- * Damaged screen at front door
- * Palm tree growing against house wall, crushing gutter
- * Rear porch concrete spalling at rail and at step
- * Paint overspray on roof tile
- * Young palm growing against house
- * Window frames discolored
- 6. Possible Restoration/Enhancement Measures:

- a. Remove porch screening.
- b. Remove miscellaneous brackets.

Building No.: 135 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 135 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Metal straps on chimney * Aluminum screen door at back porch	* Replacement door off dining room

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Many broken roof tile
- * Crawl space access opening lacks cover
- * Crack in step at back porch
- * Window glazing putty needs repair
- * No surface bolts at tops of "balcony" French doors (some bottom bolts also missing)
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Replace aluminum screen door with wooden screen door.

Building: 138 (OQ Type A)

Building No.: 138

Date Constructed: 1929

Area: 1604 sq. ft.

Historical Use: Field Grade Officer Family Housing Current Use: Filed Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The metal straps on the chimney and the aluminum screen door at the rear porch are non-contributing elements.

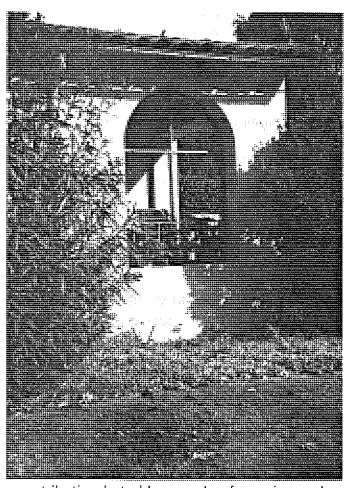
5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Downspout at front displaced
- * Small concrete spalling, front porch rail
- * Palm trees sprouting adjacent to house walls
- * Some foundation vent screens painted solid
- * Attic vent screens missing
- 6. Possible Restoration/Enhancement Measures:

- a. Remove metal straps on chimney.
- b. Replace aluminum screen door with wooden screen door.

Building: 138 (OQ Type A)



3.16 Non-contributing but older wooden frame in porch archway.

Building: 141 (OQ Type A)

Building No.: 141

Date Constructed: 1929

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The screened and roofed back porch enclosure, with wood infill at the upper arch section, is a noncontributing element.

Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Palm trees growing against rear porch wall and front wall
- * Downspout connection displaced at rear wall
- * Broken roof tile
- * Brown paint on roof tile

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Remove porch screening.

Building: 145 (OQ Type A)

Building No.: 145

Date Constructed: 1929

Area: 1604 sq. ft.

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Infilled wood frame at side terrace * Roof added to back porch	* Bath tub and enclosure

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Paint overspray on roof tile
- * Window glazing putty cracked
- * Concrete wall spalling at steel rail at side porch
- * Minor interior crack in dining room wall
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Remove new items at back porch and side terrace.

Historical Use: Field Grade Officer Family Housing

Building No.: 149 Date Constructed: 1929

Current Use: Field Grade Officer Family Housing

Building: 149 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The steel foundation access dam is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken roof tiles
- * Crawl space access cover missing at front
- * Window glazing putty old and flaking
- * Foundation vent screen missing
- * Palm tree growing against house wall
- * Minor checking of gable end rafter at left wall
- * Painted floor tile at side porch
- 6. Possible Restoration/Enhancement Measures:

See general form for OQ Type A Buildings.

Building No.: 153

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

Building: 153 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Wood piece added to front porch rafters * Wood panel added to arch at side porch * Screen doors at side porch * Metal dams at foundation vents * Metal bracket at round gable end attic vent	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Minor concrete cracks at front porch
- * Downspout displaced at front wall
- * Chipped concrete wall at side porch
- * Gutter displaced at rear wall
- * Roof tile missing at front wall, left end
 - * Window glazing putty falling off

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Remove miscellaneous added exterior elements and screen doors.

Historical Use: Field Grade Officer Family Housing
Current Use: Field Grade Officer Family Housing

Building: 157 (OQ Type A)

Date Constructed: 1929

Area: 1604 sq. ft.

Building No.: 157

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The partially screened-in side porch and the aluminum screen doors on the rear and side porches are non-contributing elements.

5. Maintenance Considerations:

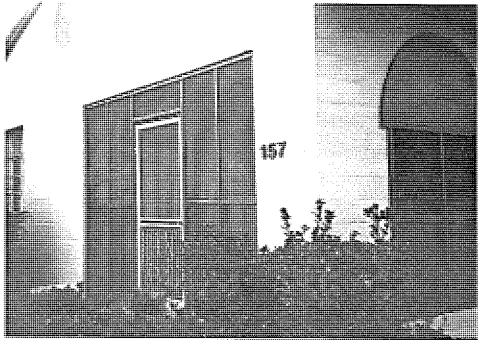
Unique to this building. See general form for OQ Type A Buildings.

- * Broken and missing roof tile
- * Missing screens, foundation and attic vents
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Remove porch screening and aluminum screen doors.

Selected Photograph of Building Detail



3.17 Porch screening, aluminum screen door.

Building No.: 161 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 161 (OQ Type A)

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Front porch roof, beam and brackets removed * Side porch partially enclosed * Painted side porch tile floor * Concrete foundation vent cover * Aluminum screen door at rear porch * Steel foundation vent cover	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

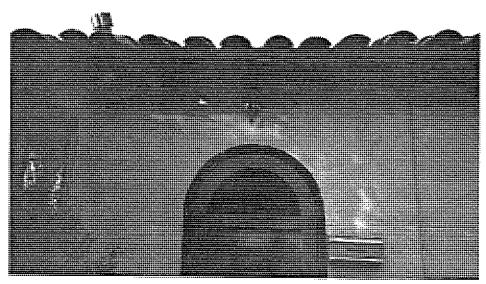
- * Palm tree growing against house wall
- * Window glazing putty in poor condition
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Restore front porch roof.

Selected Photograph of Building Detail

Building: 161 (OQ Type A)



3.18 Entry doorway showing absence of porch roof, beam and brackets.

Date Constructed: 1929

Historical Use: Field Grade Officer family Housing Current Use: Field Grade Officer Family Housing

Building: 163 (OQ Type A)

Area: 1604 sq. ft.

Building No.: 163

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition:

See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type A Buildings. The steel foundation vent dams and the aluminum screen doors at the side and rear porches are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken roof tile
- * Attic vent screens missing
- * Middle piece of rear window missing
- * Downspout at rear wall missing
- * Foundation vent dams detached
- * Minor paint blistering at exposed end rafter at front gable end
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Replace the aluminum screen doors with wooden screen doors.

Historical Use: Filed Grade Officer Family Housing

Building: 166 (OQ Type A)

Building No.: 166 Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Area: 1604 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type A Buildings

3. Building Description/Condition: See general form for OQ Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type A Buildings.

Exterior	Interior
* Screened archway at side porch * Both side porch screen doors missing * Metal straps on chimney * Aluminum screen door at rear porch * Steel foundation vent dams	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type A Buildings.

- * Broken roof tile
- * Palm tree growing against house front wall
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type A Buildings.

a. Remove porch screening and replace porch screen doors.

Date Constructed: 1929

Officers' Quarters Type B

Historical Use: Officer Family Housing Current Use: Officer Family Housing

Area: 1604 sf

2. Historical and Architectural Significance:

The Officers' Quarters Type B home is one of the original building types built in the early years of construction at March AFB. There are 10 OQ Type B residences at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition:

Description: Officers' Quarters Type B is a 1604 sf single story residence, built for occupancy by field grade officers. It is a standard type for March AFB, sometimes designated by subtypes B-1 and B-2. The Type B building is a one-story hollow-wall concrete residence with a Mission tile side gabled roof. It is distinguished by a cross gable front extension and a small open porch at one end. As with most homes in the officers quarters sector, there are B-1 and B-2 variations, distinguished by the location of the front gable bedroom extension, right for B-1 and left for B-2, and the location of a rear kitchen, located opposite the bedroom extension. The B building is an attractive example of Mission Revival design. It is a linear design, particularly at the facade. Its fenestration offers a pleasing mix of forms, from the balconied rectangular openings with French doors to the arched openings at the side porches (Photograph 3.19). The Officers' Quarters Types A and B are quite similar and generally appear next to one another in a courtyard pattern.

The Type B building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: a balcony with steel rails and French doors opening from the living room; the original fireplace, mantle, and adjoining bookcases; built in sideboard; double arched openings into the living room; a front porch with paving tiles; and decorative rafter tails and brackets. There are few major intrusions into this historical integrity, the most notable being the replacement of the original wooden casement windows with aluminum casements; a dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet.

General Condition: See Officer's Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Single large round vent in gable ends * Wooden front door with grill over small window * Front screen door * Copper gutters and downspouts * Paving tiles in side porch * Low concrete wall at porches * Small arched opening at side porch * Nine-light, one-panel door to side porch * Wooden windows in mud room * Living room balcony, with rail and french doors * Concrete splash guard * Heavy wooden beam and bracket at front porch * Square hole foundation vents * Moulding on exterior doors and windows * Stucco upper gable end wall	* Brick fireplace, tile hearth * Wood mantle * Built-in shelves by fireplace * Double interior arched openings * Built-in sideboard, dining room * Built-in telephone niche * Plaster ceilings, except kitchen and bath * Three panel interior doors * Picture moulding and base trim * Oak plank flooring in entry (common) * Oak strip flooring in closets * Hexagonal tile in family bath floor (common) * Wainscotting in bath (common) * Attic access door * Curved niche in living room * Six-light, one-panel door in mud room

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * HV/AC unit and water heater * Concrete cover for foundation vents * Bathroom window sealed off (common) * Kitchen window sealed off (common) * Wood in-filled walls at back porch with wooden windows and wooden screen door	* Dropped acoustic tile ceilings in kitchen, bath, and family room * Kitchen appliances and fixtures * Non-historic carpeting * New kitchen cabinets, floor * New bath cabinets, fixtures, floor * HV/AC floor grills

5. Maintenance Considerations:

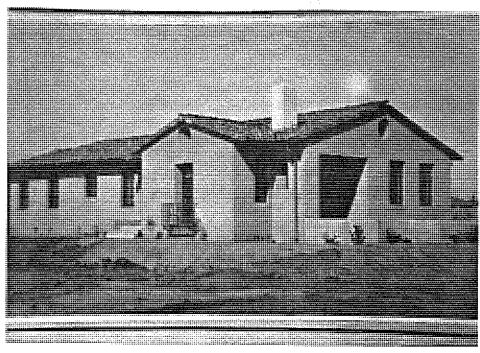
See individual building forms.

6. Possible Restoration/Enhancement Measures:

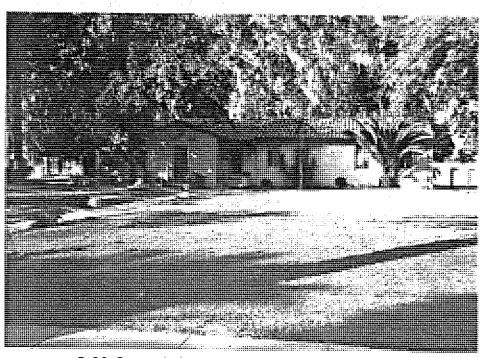
As discussed earlier, the historical integrity is generally very high for the B buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters B type buildings, four non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath; and temporary porch roof covers. As these items are replaced, every effort should be made to replicate or approximate the original design. Temporary roof covers exist throughout the Officers' Quarters but are most common with the A and B models. As they deteriorate, they should be removed. Alternatively, the base could develop a uniform design for patio covers, based upon historical precedents in the historical district, such as the terrace enclosures ("lanais") in the F and G models.

Priority restoration undertakings, linked to maintenance activities:

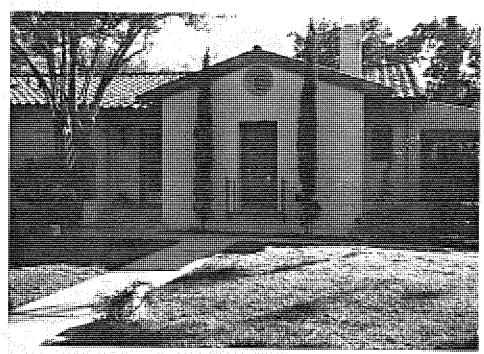
- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with wooden or steel casements. The Type B Officers' Quarters originally had wooden casements like those found near the southwest corner of the Officers' Club (Building 110).
- Restore interior conditions to allow sealed-off exterior windows to become functional.
- 4. Consider removal of the non-contributing wooden enclosure of the back porch. If the enclosure is to remain in place, consider stucco finish for more compatible appearance. Provide more finished detailing throughout the existing enclosure.
- 5. Restoration of hardwood floors as carpeting and parquet flooring deteriorate.
- 6. Remove temporary patio covers as they deteriorate; replace only with uniform model based upon historical precedent.
- 7. Replace aluminum screen doors with wooden screen doors.



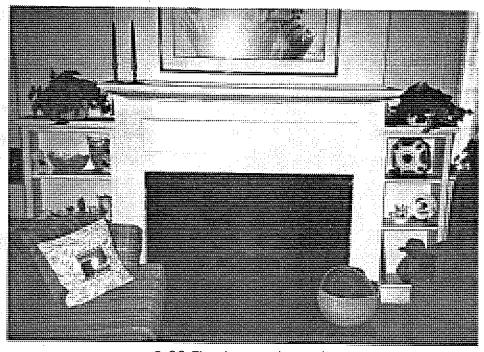
3.19 Type B Officers' Quarters, 1929.



3.20 General view of Officers' Quarters, Type B.



3.21 Living room balcony.



3.22 Fireplace and mantle.

Selected Photographs of Building Detail

OQ Building Type B



3.23 Arched niche in living room.



3.24 Wooden windows in back porch; these are not original, but are quite old.

Building No.: 121 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 121 (OQ Type B)

Area: 1570 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for OQ Type B Buildings. The remodeled living room niche is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Ceiling cracks in bedroom, previously repaired
- * Portion front porch downspout missing
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Restore living room niche and front downspout.

Building No.: 126 Historical Use: Field Grade Officer Family Housing
Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Area: 1570 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior
* Aluminum front screen door * Enclosed side porch * Partially in-filled small arched opening at side porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

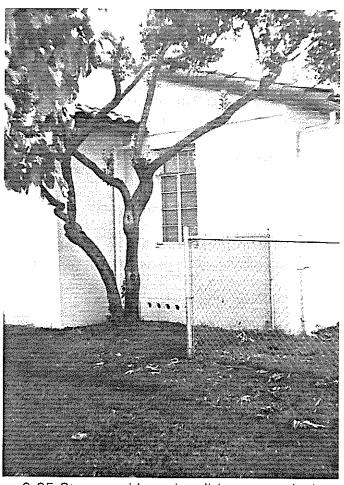
- * Many broken roof tile
- * Palm tree growing against front roof
- * White paint on brown trim at right wall
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Restore small arched opening at the side porch, remove porch enclosure, and remove aluminum screen door.



Building: 126 (OQ Type B)



3.25 Stucco gable end wall (upper portion).

Building: 129 (OQ Type B)

Building No.: 129

Date Constructed: 1929

Area: 1570 sq. ft.

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type B Buildings. The metal porch cover and the mud room door are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

* Tree growing against front porch wall

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Remove metal porch cover.

Building No.: 134 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Building: 134 (OQ Type B)

Area: 1570 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior
* Metal strap on chimney * Metal canopy over side porch * Aluminum screen door at side porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Front porch downspout disconnected
- * Hole drilled in front porch roof bracket
- * Foundation vent screens missing
- * Broken roof tile
- * Window frames discolored
- 6. Possible Restoration/Enhancement Measures: See general form for OQ Type B Buildings.

Building No.: 136 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929 Current Use: Field Grade Officer Family Housing

Area: 1570 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior	
* Grill in front door glass panel missing * Aluminum screen door at entry * Awkwardly relocated downspout at water heater compartment * Canopy over side porch		

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- a. Young palm tree growing against house eventually will damage gutters and roof tile
- b. Broken window on right wall
- c. Missing roof tile

6. Possible Restoration/Enhancement Measures:

See general form for OQ Type B Buildings.



Building: 136 (OQ Type B)

Date Constructed: 1929

Historical Use: Field Grade Officer Family Housing Current Use: Field Grade Officer Family Housing

Building: 137 (OQ Type B)

Area: 1570 sq. ft.

Building No.: 137

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior
* Aluminum entry screen door * Grill missing on front door * Canopy over side porch * Metal straps on chimney * Aluminum screen door at side porch * Concrete panel foundation vent covers * Splash block missing at rear * Television antenna	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Caulking needed at front gable end vent (wood to concrete)
- * Roof tile missing and broken
- * Rear downspout displaced, bottom portion missing
- * Foundation vent screens painted shut

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Remove aluminum screen doors and canopy at side porch.

Building No.: 139 Historical Use: Field Grade Officer Family Housing Date Constructed: 1929

Area: 1570 sq. ft.

Current Use: Field Grade Officer Family Housing

Building: 139 (OQ Type B)

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition: See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior	
* Stud wall behind front & rear bath windows visible from exterior * Side porch enclosed; screen door missing * Grill missing from front door * Water heater flue much too long (crooked) * Small arch at side porch infilled		·

Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Vent screens at foundation painted shut
- * Roof tile missing and broken
- * 4" diameter hole in sidewalk along Gilley Street near F Street
- * Screen door missing on side porch
- * Water heater flue too long (crooked)

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Remove small arch at side porch.

Building: 147 (OQ Type B)

Building No.: 147

Date Constructed: 1929

Area: 1570 sq. ft.

Historical Use: Field Grade Officer Family Housing Current Use: Field Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior	
* Aluminum screen door at entry and rear porch * Grill missing on entry door		
* Side porch roof canopy		

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Roof tile broken
- * Foundation vent screen missing
- * Splash block missing at rear
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Remove aluminum screen doors, replace with wooden screen doors.

Building No.: 155

Historical Use: Field Grade Officer Family Housing

Current Use: Field Grade Officer Family Housing

Building: 155 (OQ Type B)

Area: 1570 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Buildings.

Exterior	Interior
* Aluminum screen entry door * Screen panel added to side porch at small arched opening * Side porch screened enclosure * Original side porch screen door missing * Steel foundation vent dam * Grill missing at front door	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Buildings.

- * Roof tile missing, displaced, and broken
- * Window glazing putty in poor condition
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Buildings.

a. Remove aluminum screen doors and screened enclosures.

Building No.: 168 Historical Use: Field Grade Officer family Housing Date Constructed: 1929 Current Use: Field Grade Officer family Housing

Building: 168 (OQ Type B)

Area: 1570 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type B Buildings

3. Building Description/Condition:

See general form for OQ Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type B Building.

Exterior	Interior
* Aluminum screen door at entry * Grill missing on entry door * Metal bracket at rear wall * Metal canopy at side porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type B Building.

- * Foundation vent screens painted shut
- * Roof tile broken & displaced
- * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type B Building.

a. Remove aluminum screen door and porch canopy.

Officers' Quarters Type C

Historical Use: Officer Family Housing Current Use: Officer Family Housing Date Constructed: 1929

Area: 1400 sf

2. Historical and Architectural Significance

The Officers' Quarters Type C home is one of the original building types built in the early years of construction at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition

Description: Officers' Quarters Type C is a 1400 sf single story residence, built for occupancy by company grade officers. It is a standard type for March AFB, sometimes designated by subtypes C-1 and C-2; there are six C-type buildings within the historic district. The Type C building is a one-story hollow wall concrete residence with a side gable roof in tile. It is distinguished from other housing types in the officers quarters by its essentially square plan and by the fact that it is the only two-bedroom plan in the area. As with other types, there are C-1 and C-2 variations, distinguished by the location of an open front porch, right for C-1 and left for C-2. The Type C building originally included wooden French door and wooden casement windows (Photograph 3.26).

The Type C building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: a tiled front patio with French doors behind; the original fireplace, mantle, and adjoining bookcases; and original cabinets in the laundry room. There are few major intrusions into this historical integrity, the most notable being the replacement of the original wooden casement windows with aluminum casements; a dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet.

General Condition: See Officers' Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Stucco chimney * Tile floor at front terrace * Two pair french doors at front terrace * Wooden screen doors at front terrace * Copper gutters and downspouts * Large porch flat-laid beam and four brackets * Radiator vents at eaves * Large round recessed attic vent * Low concrete wall around front terrace * Square foundation vents * Concrete splash guard * Moulding on exterior doors and windows * Original attic access stairs	* Brick fireplace * Wood mantle * Built-in shelves by fireplace * Plaster ceilings, except kitchen and bath * Three panel interior doors * Picture moulding and base trim curved niche in living room * Attic access door and stairs * Laundry room cabinets

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * HV/AC unit and water heater * Concrete or metal dams at foundation vents (common) * Rear window painted out (common)	* Removal of wall of "maid's room," to create a family room * Dropped acoustic tile ceilings in kitchen, bath and family room * Kitchen cabinets, appliances, fixtures, and floor * New bath cabinets, fixtures, and floor * Non-historic carpeting * Some front terraces enclosed

5. Maintenance Considerations:

See individual building forms.

6. Possible Restoration/Enhancement Measures:

As discussed earlier, the historical integrity is generally very high for the C buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters C type buildings, four non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath; and temporary porch roof covers. As these items are replaced, every effort should be made to replicate or approximate the original design.

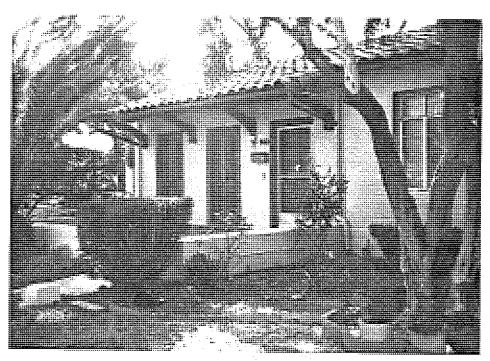
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with steel or wooden casements. The C Type originally featured wooden casements. Models still exist for both the steel and wooden casements. Steel casement windows exist in smaller utility buildings, including the pump houses. Wooden casements may be seen at the Officers' Club (Building 110).
- 3. Restoration of hardwood floors as carpeting and parquet flooring deteriorate.
- 4. Remove front terrace covers.

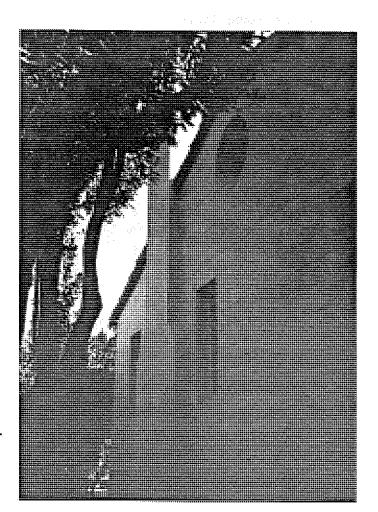
Selected Photograph of Building Detail



3.26 Type C Officers' Quarters, 1929.



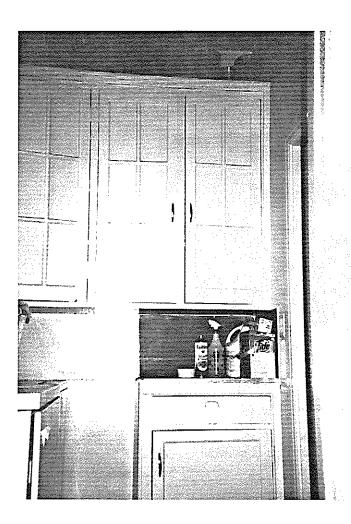
3.27 General view of Officers' Quarters, Type C.



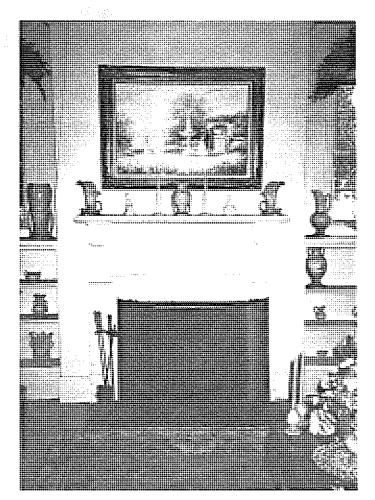
3.28 Stuccoed chimney.

Selected Photographs of Building Detail

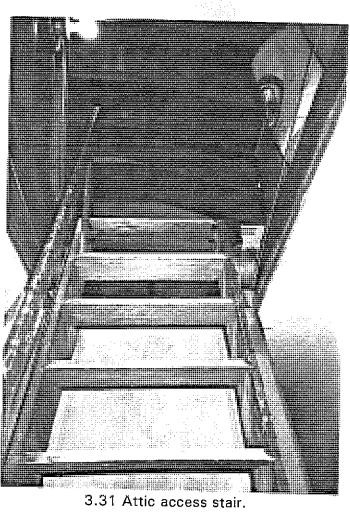
OQ Building Type C



3.29 Laundry room cabinets.



3.30 Fireplace, mantle, and built-in shelving.



Building No.: 125 Historical Use: Company Grade Officer Family Housing Date Constructed: 1929 Current Use: Company Grade Officer Family Housing

Building: 125 (OQ Type C)

Area: 1400 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type C Buildings.

Exterior	Interior
* Front terrace enclosed with aluminum system, front screen door removed * Rear downspout altered * Small metal enclosure added to rear wall	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Broken roof tile
- * Palm tree growing against main wall
- Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Remove aluminum enclosure at front terrace.

Building No.: 130
Date Constructed: 1929

Area: 1400 sq. ft.

Historical Use: Company Grade Officer Family Housing

Building: 130 (OQ Type C)

Current Use: Company Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type C Buildings.

Exterior	Interior
* Aluminum front screen door does not align with the walkway or front terrace steps * Exterior mounted screen, in round, gable end attic vent * Metal canopy over back porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Many broken roof tiles
- * Window glazing putty in poor condition
- * Holes in side of water heater compartment

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Remove metal canopy and aluminum front screen door.

Building No.: 133 Historical Use: Company Grade Officer Family Housing Date Constructed: 1929 Current Use: Company Grade Officer Family Housing

Building: 133 (OQ Type C)

Area: 1400 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type C Buildings.

Exterior	Interior
* Inappropriate entry door * Aluminum screen doors * Television antenna	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Gutter detached at front left
- * Paint on roof tile
- * Broken and missing roof tile
- * Gutter damaged
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Replace entry door and remove aluminum screen doors.

Building No.: 143 Historical Use: Senior Grade Officer Family Housing
Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Building: 143 (OQ Type C)

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type C Buildings. The infilled radiator niche at the front door is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Broken roof tile
- * Living room ceiling cracks (previously repaired)
- * Bracket trim at entry porch missing a piece at porch light
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Repair porch bracket trim and open niche at front door.

Building No.: 151 Historical Use: Company Grade Officer Family Housing Date Constructed: 1929 Current Use: Company Grade Officer Family Housing

Building: 151 (OQ Type C)

Area: 1400 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for OQ Type C Buildings. The aluminum screen doors at the front and rear are non-contributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Broken roof tile
- * Mortar broken away at ridge of left gable end
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Remove aluminum screen doors, replace with wooden screen doors.

Building No.: 159 Historical Use: Company Grade Officer Family Housing
Date Constructed: 1929 Current Use: Company Grade Officer Family Housing

Area: 1400 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type C Buildings

3. Building Description/Condition:

See general form for OQ Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type C Buildings. The metal straps on the chimney and the aluminum screen doors at the front and rear are non-contributing elements.

Building: 159 (OQ Type C)

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type C Buildings.

- * Broken roof tile
- * Window glazing putty in poor repair
- * Front downspout detached
- * Young palm trees growing against front terrace wall
- * Rear downspout and splash block missing
- * Bottom piece of downspout missing
- * Foundation crawl space vents buried

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type C Buildings.

a. Replace aluminum screen doors with wooden screen doors.

Officers' Quarters Type D

Historical Use: Officer Family Housing Current Use: Officer Family Housing

Date Constructed: 1929 Area: 2153 sf

2. Historical and Architectural Significance:

The Officers' Quarters Type D home is one of the original building types built in the early years of construction at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition:

Description: Officers' Quarters Type D is a 2153 sf single story residence, built for occupancy by senior grade officer. It is a standard type for March AFB, often designated by its subtypes D-1 and D-2; there are only two D-type buildings within the historic district. The Type D building is a one-story hollow wall concrete residence with a Mission tile gabled roof. The D type house is H-shaped, featuring a long side gabled core with front gabled side elements forming front and rear patios. Types D-1 and D-2 are mirror images; on D-1 the side element is longer on the right, with the longer front element on the left for D-2. This front extension serves as the master bedroom. The D type buildings originally included wooden casement windows as well as wooden French doors. The Type D and E buildings are similar in plan and in the fact that very few examples were ever built; these two senior officer housing designs were precursors for the Types F and G, which would be built in large number during the early 1930s (Photograph 3.32).

The Type D building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: an enclosed rear patio with French doors opening from the living room (this patio was originally open but was enclosed early); the original fireplace, mantle, and adjoining bookcases; the original three-panel interior doors; and hexagonal tile floors in the "maid's room" bathroom. There are few major intrusions into this historical integrity, the most notable being the replacement of the original wooden casement windows with aluminum casements; a dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet.

General Condition: See Officers' Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface on house and rear terrace enclosure walls * Mission tile roof * Stucco chimney * Diamond pattern attic vents and deep round attic vents * Original front door and screen (six-light, one-panel door) * Copper gutters and downspouts * Large porch flat-laid beam * Radiator vents extending through roof * Wood trim at exterior doors * Steel windows at rear patio terrace * Square foundation vents * Concrete splash guard * Original door and screen door at laundry * Carved rafter tails	* Brick fireplace, tile hearth * Wood mantle * Built-in shelves by fireplace * Plaster ceilings, except kitchen and bath * Three panel interior doors * Picture moulding and base trim curved niche in living room * Terrace doors from living room * Hexagonal tile floor in maid's bathroom

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * Two HV/AC units * Concrete cover for foundation vents * Dams at foundation * Closed in rear patio * Exterior water heater	* Dropped acoustic tile ceilings in kitchen and bath and family room * Kitchen cabinets * Kitchen appliances and fixtures * Non-historic carpeting * New kitchen cabinets, floor * New bath cabinets, floor * Two bathroom windows closed off

5. Maintenance Considerations:

See individual building forms.

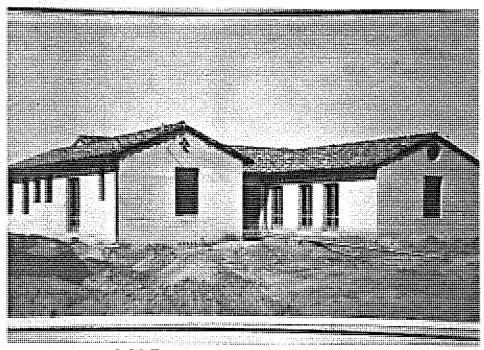
6. Possible Restoration/Enhancement Measures:

As discussed earlier, the historical integrity is generally very high for the D buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters D type buildings, three non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; and acoustical tiles in kitchen and bath ceilings. As these items are replaced, every effort should be made to replicate or approximate the original design.

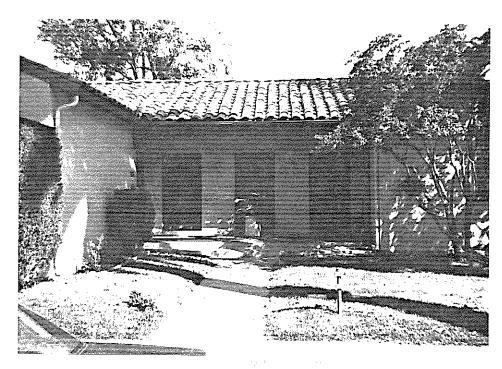
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with wooden or steel casements. The Type D Officers' Quarters originally featured three-light wooden casement windows similar to those that remain near the southwest corner of the Officers' Club (Building 110).
- 3. Remove aluminum patio enclosures, replace with wooden enclosures if necessary.
- 4. Restoration of hardwood floors as carpeting and parquet flooring deteriorate.

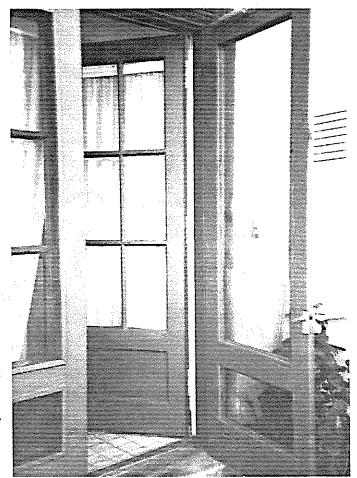
Selected Photograph of Building Detail



3.32 Type D Officers' Quarters, 1929.



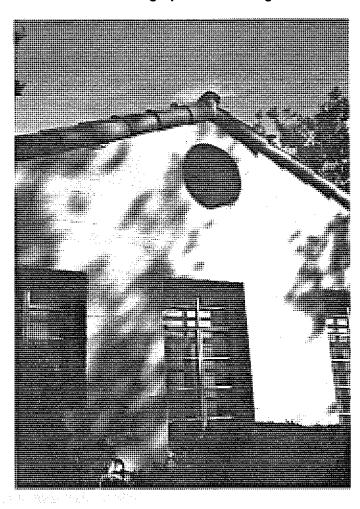
3.33 General view of Officers' Quarters, Type D.



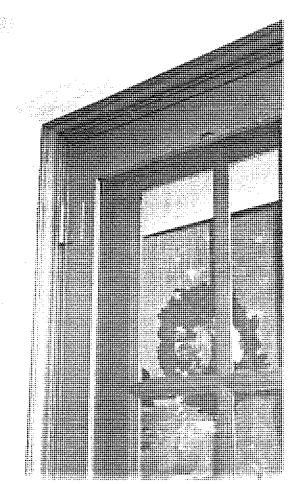
3.34 Original french doors and screens.

Selected Photographs of Building Detail

OQ Building Type D



3.35 Round gable end vent.



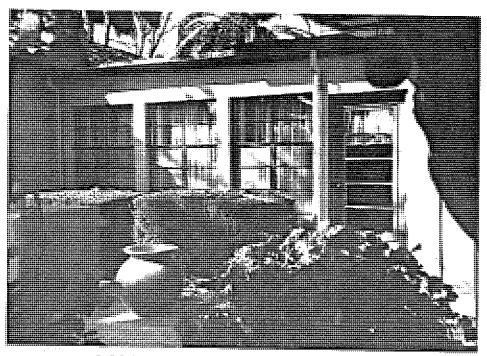
3.36 Wood trim, exterior doors.

Selected Photographs of Building Detail

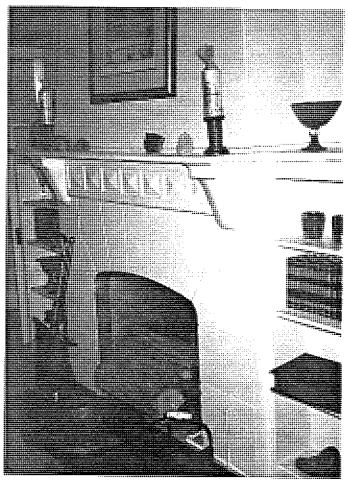
OQ Building Type D



3.37 Replacement metal windows, without trim.



3.38 Rear patio enclosure, Building 167.



3.39 Fireplace, mantle, and cabinets.

Building No.: 164 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1929 Current Use: Senior Grade Officer Family Housing

Building: 164 (OQ Type D)

Area: 2153 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type D Buildings

3. Building Description/Condition:

See general form for OQ Type D Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type D Buildings.

Exterior	Interior
* Rear terrace enclosed with partial new and partial old floor	* Front terrace doors changed to single door; old style door used

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type D Buildings.

- * Checks in front porch beam
- * Roof tile broken, displaced, missing
- * Tree growing against patio wall; patio separating from house wall
- * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures:

See general form for OQ Type D Buildings.

Building No.: 167 Historical Use: Senior Grade Officer Family Housing
Date Constructed: 1929 Current Use: Senior Grade Officer Family Housing

Area: 2153 sq. ft.

2. Historical and Architectural Significance:

See general form for OQ Type D Buildings

3. Building Description/Condition:

See general form for OQ Type D Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type D Buildings.

Exterior	Interior
 * Rear patio tile removed * Rear patio cover * New gate (appropriate design) * Chimney antenna straps * Steel brackets at rear wall 	* Wall sconce light fixtures removed

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type D Buildings.

- * Attic vent screens missing
- * Downspout missing
- 6. Possible Restoration/Enhancement Measures:

See general form for OQ Type D Buildings.



Building: 167 (OQ Type D)

Officers' Quarters Type E

Historical Use: Officer Family Housing Current Use: Officer Family Housing

Date Constructed: 1929 Area: 1874 sf

2. Historical and Architectural Significance:

The Officers' Quarters Type E home is one of the original building types built in the early years of construction at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition:

Description: Officers' Quarters Type E is a 1874 sf single story residence, built for occupancy by senior grade officers. It is a standard type for March AFB, sometimes designated by subtypes E-1 and E-2; there are only two E-type buildings within the historic district. The Type E-1 building is a one-story hollow wall concrete residence with a Mission tile gabled roof. The E type house is H-shaped, featuring a long side gabled core with front gabled side elements forming front and rear patios. Types E-1 and E-2 are mirror images; on E-1 the side element is longer on the right, with the longer front element on the left for E-2. The E type buildings originally included wooden casement windows as well as wooden French doors; today, the French doors are wooden but the windows are aluminum casements. The Type D and E buildings are similar in plan and in the fact that very few examples were ever built; these two senior officer housing designs were precursors for the Types F and G, which would be built in large number during the early 1930s.

The Type E building retains a very high degree of integrity, with most of its important original exterior features intact. An enclosed rear patio with French doors opening from the living room was originally open but was enclosed early. There are few major intrusions into the building's historical integrity on the exterior elevations, the most notable being the replacement of the original wooden casement windows with aluminum casements. Architectural field crews were denied access to both Type E Officers' Quarters. The housing office reported that the interior spaces have much the same alterations that characterize the other Officers' housing - dropped acoustical tile ceilings in the kitchen and baths, and covering of most oak plank flooring with parquet or carpet.

General Condition: See Officers' Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Stucco chimney * Diamond pattern attic vents * Pair of french doors with wood screens at entry * Tiled entry porch and rear terrace * Copper gutters and downspouts * Large porch flat-laid beam with curved bracket at front porch * Four-light, two-panel doors and wooden screen doors at left wall * Wood trim at exterior doors * Square foundation vents * Concrete splash guard	[Denied access]

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * HV/AC unit and water heater * Concrete cover for foundation vents * Wooden gate at rear terrace wall (similar to original)	[Denied access]

5. Maintenance Considerations: See individual building forms.

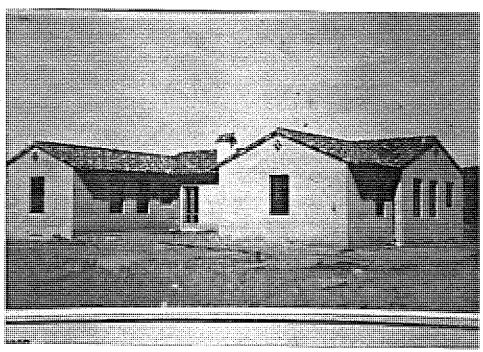
6. Possible Restoration/Enhancement Measures: Officers' Quarters Type E

As discussed earlier, the historical integrity is generally very high for the E buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters E type buildings, three non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; and acoustical tiles in kitchen and bath. As these items are replaced, every effort should be made to replicate or approximate the original design.

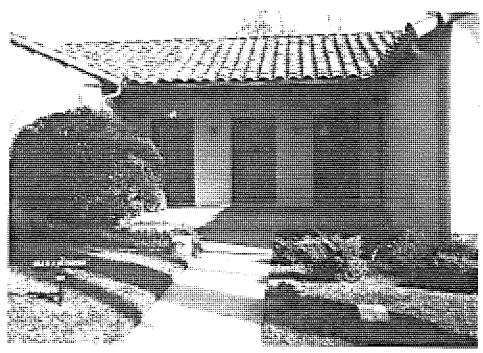
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with wooden or steel casements. The original Type E quarters had three-light wooden casement windows like those that still exist near the southwest corner of Building 110. These would be the most appropriate type replacement windows.
- 3. Restoration of hardwood floors as carpeting and parquet flooring deteriorate.

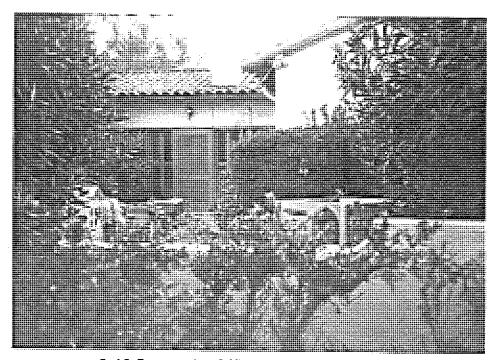
Selected Photograph of Building Detail



3.40 Type E Officers' Quarters, 1929.



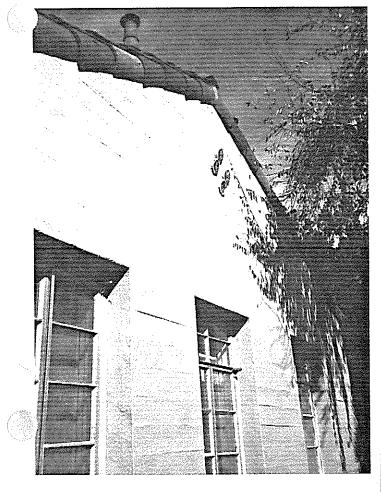
3.41 General view of Officers' Quarters, Type E.



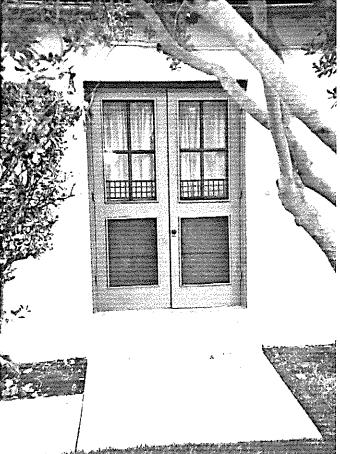
3.42 Rear patio, Officers' Quarters Type E.

Selected Photographs of Building Detail

OQ Building Type E



3.43 Tile attic vents at gable ends.



3.44 Wooden screen doors.

Building No.: 162 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1929 Current Use: Senior Grade Officer family Housing

Area: 1874 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type E Buildings

3. Building Description/Condition:

See general form for OQ Type E Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type E Buildings. The covered terrace at the rear is a non-contributing element.

Building: 162 (OQ Type E)

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type E Buildings.

- * Paint overspray on roof tile
- * Window glazing putty in poor condition
- * Palm tree growing against roof and rear concrete patio wall
- * Broken and displaced roof tile
- * Crawl space access door detached

6. Possible Restoration/Enhancement Measures:

See general form for OQ Type E Buildings.

Building No.: 169 Historical Use: Senior Grade Officer Family Housing
Date Constructed: 1929 Current Use: Senior Grade Officer Family Housing

Area: 1874 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type E Buildings

3. Building Description/Condition:

See general form for OQ Type E Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type E Buildings. The original wooden doors and wooden screen doors at the front porch and rear patio are contributing elements.

Building: 169 (OQ Type E)

Non-Contributing Elements: Unique to this building. See general form for OQ Type E Buildings.

Exterior	Interior
* Awkward repair to wood screen door at right wall * Louvered glass door opens onto rear terrace from left wing (as viewed from rear) * Interior stud wall visible through window on left wall	[Denied access]

Maintenance Considerations:

Unique to this building. See general form for OQ Type E Buildings.

- * Attic vent screens missing
- * Roof tile missing
- * Palm tree growing against house roof
- * Pine needles & vines on roof
- * Portion of cover plate missing on water heater box in ground (found nearby, but broken)
- * Downspout displaced on left wall
- * Young palm trees growing adjacent to house

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type E Buildings.

a. Restore interior floor plan to allow sealed-off window to function.

Officers' Quarters Type F

Historical Use: Officer Family Housing Current Use: Officer Family Housing Date Constructed: 1931

Area: 2187 sf

2. Historical and Architectural Significance:

The Officers' Quarters Type F home is one of the original building types built in the early years of construction at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district. Constructed in 1931 two years after the other Officers' Quarters, types F and G are built with hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition:

Description: Officers' Quarters Type F is a 2187 sf single story residence, built for occupancy by senior grade officers. It is a standard type for March AFB, sometimes designated by subtypes F-1 and F-2; there are 14 F-type buildings within the historic district. All were constructed in 1931 under two separate contracts. The Type F building is a one-story hollow clay tile residence with a Mission tile gabled roof. The F type is easily distinguished from Types A through E by the fact that it was finished with a smooth plaster over clay tile, separating it from the rough form board finish of the other types. It is an H-shaped building, featuring a long side gabled core with front gabled side elements forming front and rear patios. Types F-1 and F-2 are mirror images; on F-1 the side element is longer on the right, with the longer element on the left for F-2. The F type buildings originally included eight-light steel casement windows with four-light transoms and wooden French doors (Photographs 3.45 and 3.46); today, the French doors are wooden but the windows are single light aluminum casements with a fixed window below.

The Type F building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: an enclosed rear patio with French doors opening from the living room (this patio was originally open but was enclosed early; these enclosures are individualized, with no uniformity which indicates that they were probably completed with available materials or according to the wishes of the occupants)(Photographs 3.47, 3.48, and 3.49); the original fireplace, mantle, and adjoining bookcases; the original interior doors; and hexagonal tile floors in the "maid's room" bathroom. In a few buildings, the original hardwood floors remain and even fewer buildings have interior doors restored to their original, unpainted condition; these doors, apparently mahogany, are striking. There are few major intrusions into this historical integrity, the most notable being the replacement of the original steel casement windows with aluminum casements; dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet. The buildings include new patio gates at the rear. While technically not contributing, these new gates are handsome and quite consistent with the original design; these are models for replacement projects throughout the base.

General Condition: See Officers' Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow clay tile construction * Smooth plaster exterior surface * Mission tile roof * Stucco chimney * Enclosed rear terrace (dates to 1935) * Two-light entry door with three-panel screen door * Tiled rear patio flooring * Copper gutters and downspouts (restricted to side porch and entry porch) * Rear and side porch doors, nine-light, two-panel * Concrete window sill extensions * Wood trim at exterior doors * Rectangular attic vents * Concrete splash guard * Heavy front porch beam without brackets * Carved, curved rafter tails * Round foundation vent holes * Ten-light french doors to enclosed terrace, or "lanai" * Steel rails at side porch * Wood form board texture on concrete patio walls * Steel rails at side porch	* Fireplace and mantle * Hexagonal tile in maid's room bath floor (common) * Maid's bathroom wainscotting * Marble bath threshold and shower enclosure (common) * Bronze threshold at rear porch * Stucco ceiling at rear porch * Telephone niche * Base trim and picture moulding * Steel windows from storage area to rear terrace * Oak flooring in closets * Interior doors * Door moulding

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * HV/AC unit and water heater * Cover for foundation vents * Rear patio wooden gate (similar to original)	* Dropped acoustic tile ceilings in kitchen and bath and family room * Kitchen appliances, cabinets, fixtures, and floor * Kitchen storage walls removed * New bath cabinets, floor * Sealed off passage between second bedroom and master bathroom * Non-historic carpeting * Seating alcove removed * HV/AC floor grills

5. Maintenance Considerations:

See individual building forms.

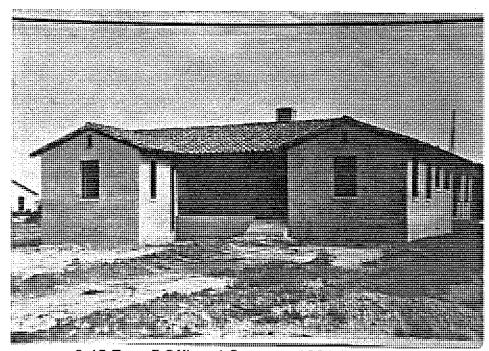
6. Possible Restoration/Enhancement Measures:

As discussed earlier, the historical integrity is generally very high for the F buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters F type buildings, three non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; and acoustical tiles in kitchen and bath. As these items are replaced, every effort should be made to replicate or approximate the original design.

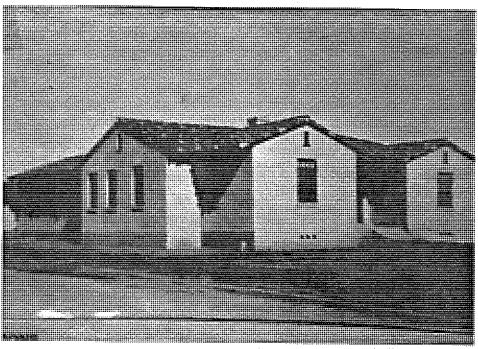
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with steel casements. The appropriate type of steel casements would be eight-light casement windows with a four-light transom. The original steel casement sash was manufactured by the Detroit Steel Products Company. Examples of these steel window types can be found on several small utility buildings and pump houses within the historic district.
- 3. Restoration of hardwood floors as carpeting or parquet flooring deteriorate.

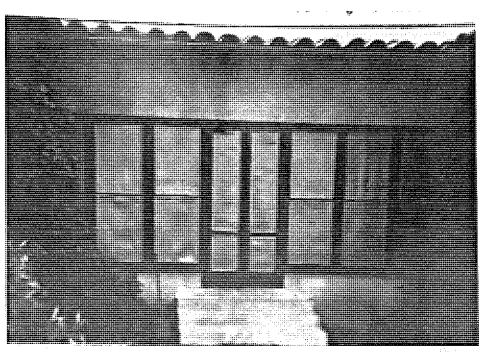
Selected Photograph of Building Detail



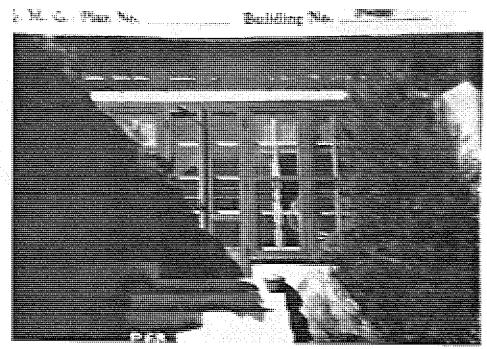
3.45 Type F Officers' Quarters, 1931 (Building 140).



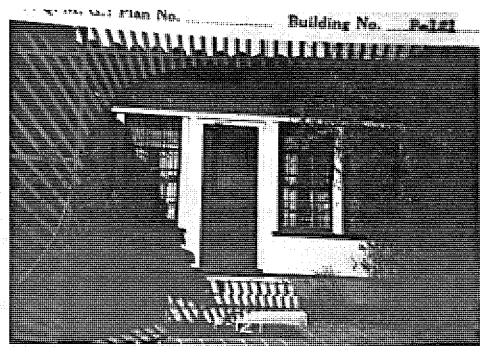
3.46 Type F Officers' Quarters, 1931 (Building 117).



3.47 Porch addition, Building 140, 1936.



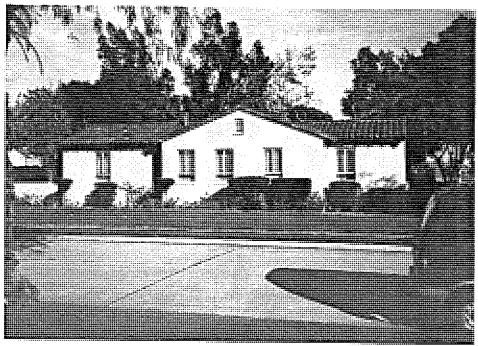
3.48 Porch addition, Building 117, 1936.



3.49 Porch addition, Building 150, 1936.



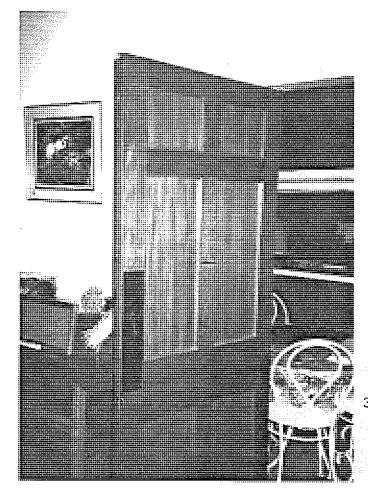
3.50 General view of Officers' Quarters, Type F.



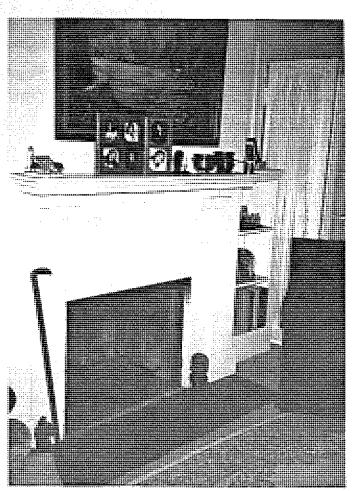
3.51 Side view of Officers' Quarters, Type F.

Selected Photographs of Building Detail

OQ Building Type F



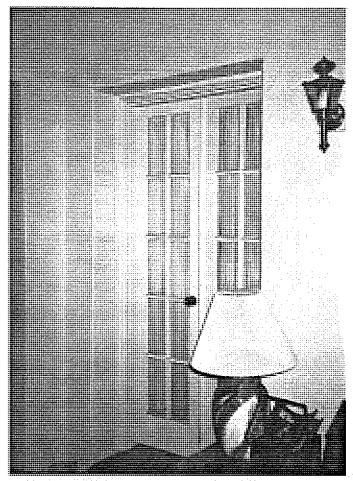
3.52 Hardwood (mahogany?) interior door, stripped to original condition.



3.53 Fireplace and mantle.

Selected Photographs of Building Detail

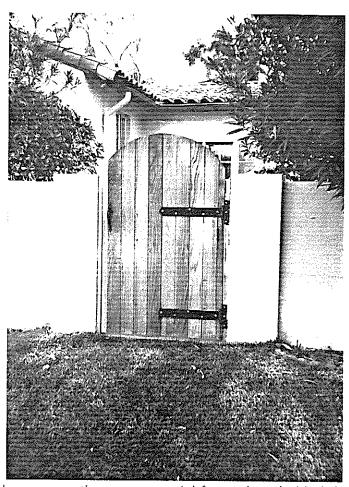
OQ Building Type F



3.54 Ten-light french doors.



3.55 Patio enclosure; these date to 1935 and are highly individualized.



3.56 New rear patio gate; a model for replace-in-kind design.

Historical Use: Senior Grade Officer Family Housing

Building: 117 (OQ Type F)

Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

Building No.: 117

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type F Buildings. The eight-light rear terrace enclosure is a contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Paint overspray on roof tiles
- * Foundation vents need screens
- * Broken roof tiles
- * Crack at window jamb on left wall
- * Chimney needs paint where straps were removed
- * Blistering paint at right wall
- 6. Possible Restoration/Enhancement Measures: See general form for OQ Type F Buildings.

Historical Use: Senior Grade Officer Family Housing

Building: 118 (OQ Type F)

Building No.: 118 Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition: See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Wood lattice around HV/AC unit * Wood lattice over patio wall * Metal straps on chimney	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

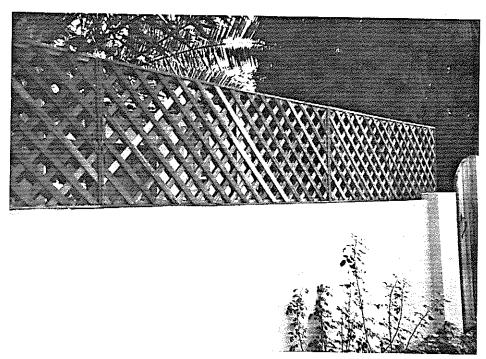
- a. Minor cracks at rear wall
- b. Roof tiles missing
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove historically inappropriate wood lattice addition atop patio wall.

Selected Photograph of Building Detail

Building: 118 (OQ Type F)



3.57 Wood lattice atop patio wall.

Building No.: 119 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type F Buildings. The aluminum screen door at the rear terrace is a non-contributing element.

Building: 119 (OQ Type F)

Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
:	* Stained mahogany doors, with four main panels and two small panels * Marble thresholds and hexagonal floor tile

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Foundation vent screen missing
- * Broken roof tile
- * Palm tree growing against entry wall and roof
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Replace aluminum screen doors with wooden screen doors.

Building: 120 (OQ Type F)

1. Basic Building Data

Building No.: 120 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for OQ Type F Buildings. The wooden panel in the entry screen door is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Broken roof tile
- * Vent screens missing at crawl space (or opening plugged)
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove wooden panel in entry screen door and replace with screen.

Historical Use: Senior Grade Officer Family Housing

Building: 122 (OQ Type F)

Building No.: 122 Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition: See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type F Buildings. The two-light rear terrace enclosure, the built-in barbecue, and the wooden panel in the entry screen door are noncontributing elements.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Paint overspray on roof tile
- * Broken roof tile
- * Rot in rear rafter tail

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove wooden panel in entry screen door and replace with screen.

Building No.: 140 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Building: 140 (OQ Type F)

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type F Buildings. The wooden bracing at the entry screen door is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Check in front porch beam
- * Broken roof tile
- * Foundation vent screens missing
- * Gap in tile at gable end of rear wall
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Repair entry screen door.

Building No.: 142 Historical Use: Company Grade Officer Family Housing Date Constructed: 1929

Area: 1400 sq. ft.

Current Use: Company Grade Officer Family Housing

Building: 142 (OQ Type F)

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition: See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for OQ Type F Buildings. The metal straps on the chimney are a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Paint overspray on roof tile
- * Palm tree growing against roof
- * Frequent hairline cracking of stucco
- * Roof tile displaced
- * Some foundation vents plugged; others need screens

6. Possible Restoration/Enhancement Measures:

See general form for OQ Type F Buildings.



Building No.: 144 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Building: 144 (OQ Type F)

Area: 2187 sq. ft.

2. Historical and Architectural Significance:

See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
	Dining room oak strip flooring intactInterior doors unpaintedLaundry in original location

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Straps on chimney	* Aluminum screen door at rear

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Roof tile missing and broken
- * Broken rafter tail at right wall
- 6. Possible Restoration/Enhancement Measures: See general form for OQ Type F Buildings.

Building No.: 146 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

- 3. Building Description/Condition:

 See general form for OQ Type F Buildings
- 4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
Replacement glazing in entry door Wooden braces on entry screen door Rear aluminum screen door	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Roof tile missing and displaced
- * Paint overspray on roof tile
- * Water heater enclosure door detached at bottom
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Restore entry door and screen door.



Building: 146 (OQ Type F)

Building No.: 150
Date Constructed: 1931

Area: 2187 sq. ft.

Building: 150 (OQ Type F)

Historical Use: Senior Grade Officer Family Housing Current Use: Senior Grade Officer Family Housing

2. Historical and Architectural Significance:
See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
Rear courtyard concrete wall adjoins house to south (unusual layout) Rear door (nine-over-two glazing)	

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Masonry barbecue in rear courtyard * Aluminum screen door at rear	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

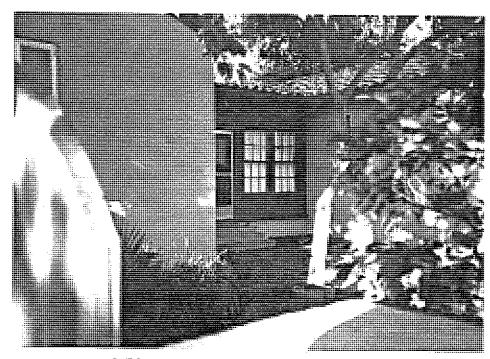
- * Poor paint job on front gutter and on gable end rafter at right wall
- * Brown paint on tile
- * Roof tile displaced
- * Foundation vents plugged
- * Palm tree in court growing against roof

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Replace aluminum screen door with wooden screen door.

Building: 150 (OQ Type F)



3.58 Rear terrace, unusual patio wall.

Building No.: 152 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type F Buildings. The wooden shelf above the rear terrace enclosure is a non-contributing element.

Building: 152 (OQ Type F)

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Displaced roof tile at front left gable end and left rear
- * Dented HV/AC duct; side cover loose
- * Heavy leaf build-up on roof
- * Cracked rear patio tile
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove wooden shelf at rear terrace.

Building: 156 (OQ Type F)

Building No.: 156

Date Constructed: 1931

Historical Use: Senior Grade Officer Family Housing Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

- 2. Historical and Architectural Significance: See general form for OQ Type F Buildings
- 3. Building Description/Condition:

 See general form for OQ Type F Buildings
- 4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Shared concrete wall at rear court * Glazed foundation access openings (glass painted)	

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Wooden trellis at rear court * Aluminum screen doors, entry and rear	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Broken and displaced roof tile
- * Foundation vent screen missing
- * Paint on roof tile
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove wooden trellis and aluminum doors.

Building: 158 (OQ Type F)

1. Basic Building Data

Building No.: 158 Historical Use: Senior Grade Officer Family Housing
Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2187 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Television antenna * Aluminum rear screen door * Steel hand rail at front steps * Wooden patio cover with corrugated roofing	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- * Minor wood deterioration at exposed gable end rafters, south and west
- * Checks in front porch beam
- * Hairline cracking of stucco on walls
- * Caulking loose at jambs of left wall windows
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

a. Remove television antenna, aluminum screen door, and patio cover.

Historical Use: Senior Grade Officer Family Housing

Date Constructed: 1931

Current Use: Senior Grade Officer Family Housing

Building: 160 (OQ Type F)

Area: 2187 sq. ft.

Building No.: 160

2. Historical and Architectural Significance: See general form for OQ Type F Buildings

3. Building Description/Condition:

See general form for OQ Type F Buildings

Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type F Buildings.

Exterior	Interior
* Wood canopy at rear patio * Steel antenna support at chimney * Aluminum screen door at side porch	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type F Buildings.

- a. Roof tile broken and displaced
- b. Young palm trees growing against house wall
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type F Buildings.

- a. Remove wooden canopy and aluminum screen door.
- b. Remove television antenna. The residences are cable ready and the antenna is a nonfunctional artifact of past use.

Officers' Quarters Type G

Historical Use: Officer Family Housing

Current Use: Family Housing

Date Constructed: 1931 Area: 2554 sf

2. Historical and Architectural Significance:

The Officers' Quarters Type G home is one of the original building types built in the early years of construction at March AFB. All are in the Mission Revival style that defines the character of the historic district and nearly all are built of the hollow wall concrete method that is a major part of the significance of this historic district; types F and G are of hollow clay tile walls, the rest are of hollow wall concrete construction. The officers quarters collectively represent one of the key sectors of the historic district.

3. Building Description/Condition:

Description: Officers' Quarters Type G is a 2554 sf single story residence, built for occupancy by senior grade officers. It is a standard type for March AFB, sometimes designated by subtypes G-1 and G-2; there are six G-type buildings within the historic district. All were constructed in 1931 under two separate contracts. The Type G building is a one-story hollow clay tile residence with a Mission tile gabled roof. The G type is easily distinguished from Types A through E by the fact that it was finished with a smooth plaster over clay tile, separating it from the rough form board finish of the A-E types. It is an H-shaped building, featuring a long side gabled core with front gabled side elements forming front and rear patios. Types G-1 and G-2 are mirror images; on G-1 the side element is longer on the left, with the longer element on the right for G-2. The G type buildings originally included steel casement windows and wooden French doors; today, the French doors are wooden but the windows are aluminum casements (Photographs 3.59 and 3.60).

The Type G building retains a very high degree of integrity, with most of its important original interior and exterior features intact. Among these: an enclosed rear patio with French doors opening from the living room (this patio was originally open but was enclosed early); the original fireplace, mantle, and adjoining bookcases; the original interior doors; and hexagonal tile floors in the "maid's room" bathroom. In a few buildings, the original hardwood floors remain and even fewer buildings have interior doors in their original, unpainted condition; these doors, apparently mahogany, are striking. There are few major intrusions into this historical integrity, the most notable being the replacement of the original eight-light steel casement windows with aluminum casements; dropped acoustical tile ceiling in the kitchen and bath; and covering of most oak plank flooring with parquet or carpet. The buildings include new patio gates at the rear. While technically not contributing, these new gates are handsome and quite consistent with the original design; these are models for replacement projects throughout the base.

General Condition: See Officers' Quarters summary statement for general building condition.

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements

Exterior	Interior
* Hollow clay tile construction * Smooth plaster exterior surface * Mission tile roof * Enclosed rear terrace (dates to 1935) * Screen doors at rear terrace * Stucco chimney * Entry doors and wooden screen doors * Tiled entry porch and rear patio * Copper gutters and downspouts * Nine-light, two-panel side porch doors * Concrete window sill extensions * Wood trim at exterior doors * Rectangular attic vents in gable ends * Concrete splash guard * Heavy beam at front porch, no brackets * Carved, curved rafter tails * Round foundation vent holes * Rough concrete form board texture visible on rear yard wall and lower portion of the front porch wall	* Fireplace and mantle * Hexagonal tile in maid's room bath floor (common); wainscotting * Marble shower enclosure (common) * Telephone niche * Base trim and picture moulding * Steel windows from storage area to rear terrace (painted glass) * Oak flooring in maid's room (common) * Marble bath thresholds * Six-panel interior doors * Door moulding * Ten-light doors to terrace * Plaster ceiling in terrace * Brass thresholds

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * HV/AC unit and water heater * Cover for foundation vents * Metal dams at foundation	* Dropped acoustic tile ceilings in kitchen and bath and family room * Kitchen cabinets * Kitchen appliances and fixtures * Non-historic carpeting * New kitchen cabinets, floor * New bath cabinets, floor * Dining room alcove filled in * Metal louver added to front door (common) * Interior doorway walled-in at middle bedroom * Floor HV/AC grills

5. Maintenance Considerations:

See individual building forms.

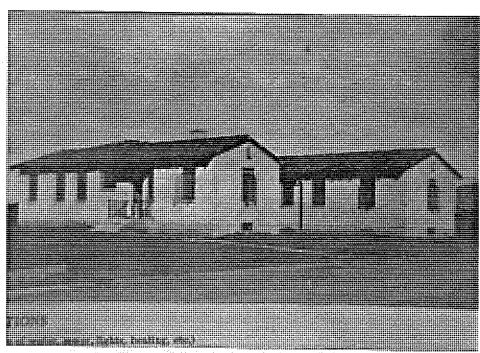
6. Possible Restoration/Enhancement Measures:

As discussed earlier, the historical integrity is generally very high for the G buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the Officers' Quarters G type buildings, three non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; and acoustical tiles in kitchen and bath. As these items are replaced, every effort should be made to replicate or approximate the original design.

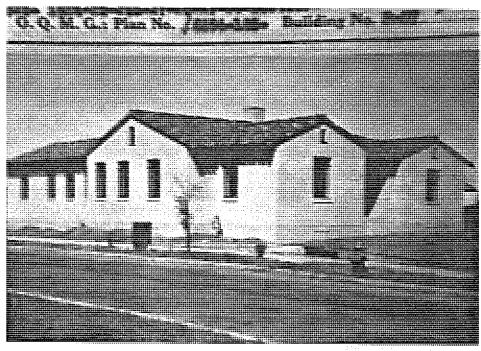
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceilings to full height as acoustical tile ceilings deteriorate.
- 2. As windows are scheduled for replacement, replace aluminum sash with steel casements. The original windows, manufactured by the Detroit Steel Products Company, had eight-light steel casement windows with a fixed four-light transom. Examples of this window type can be seen on small utility buildings and pump houses within the historic district.
- 3. Restoration of hardwood floors as carpeting and parquet flooring deteriorate.

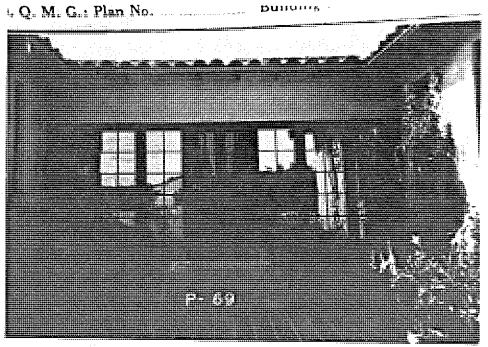
Selected Photograph of Building Detail



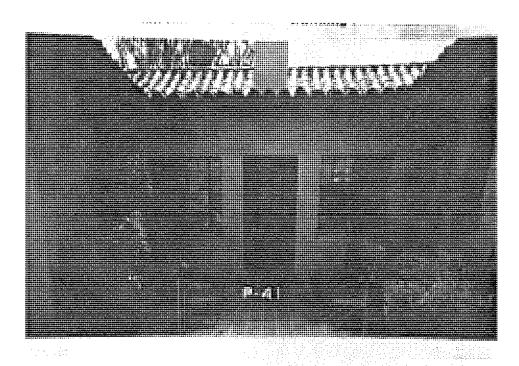
3.59 Type G Officers' Quarters, 1931 (Building 115).



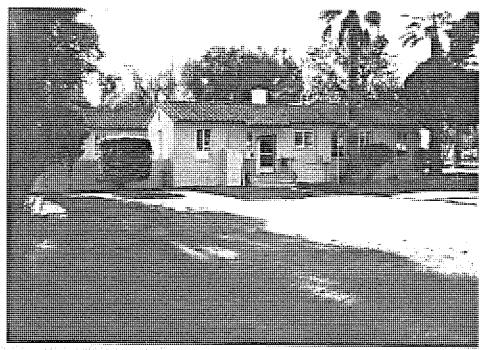
3.60 Type G Officers' Quarters, 1931 (Building 170).



3.61 Porch addition, 1936 (Building 115).



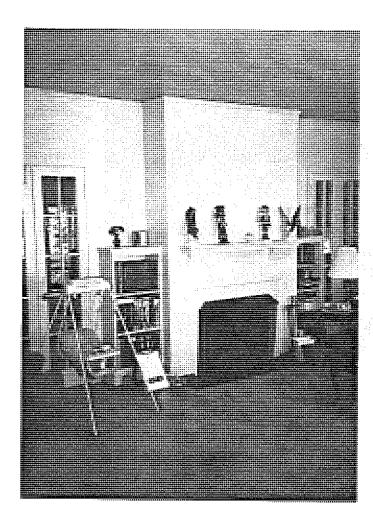
3.62 Porch addition, 1936 (Building 174).



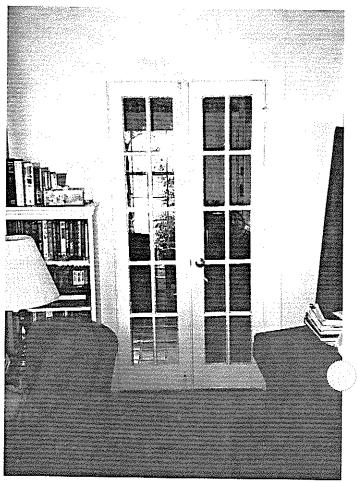
3.63 Side entry and rear courtyard.

Selected Photographs of Building Detail

OQ Building Type G



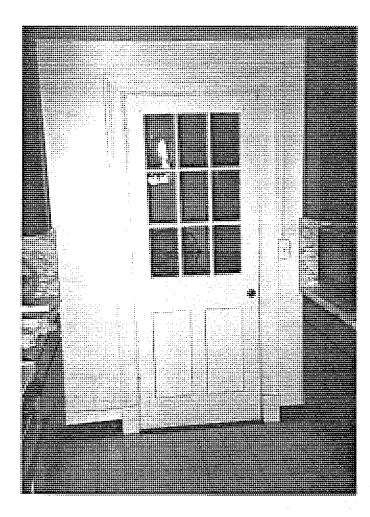
3.64 Fireplace and mantle.



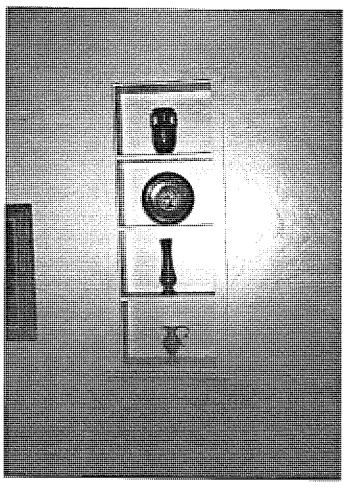
3.65 Doors from living room to terrace.

Selected Photographs of Building Detail

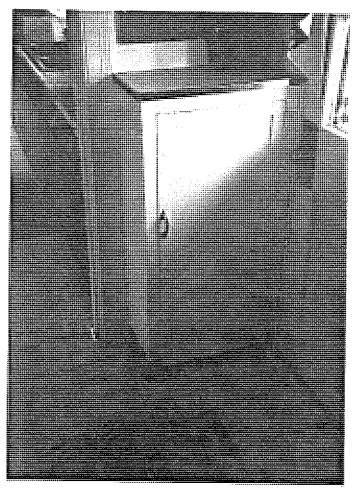
OQ Building Type G



3.66 Nine-light, two-panel door.



3.67 Dining room alcove.



3.68 Original hallway cabinet.

Building No.: 115 Historical Use: Senior Grade Officer Family Housing Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Area: 2554 sq. ft.

2. Historical and Architectural Significance:

This house has historically served as the wing commander's residence. See general form for OQ Type G Buildings.

Building: 115 (OQ Type G)

3. Building Description/Condition:

See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior	
* Wood lattice added to wall enclosing courtyard * Window glass painted at entry terrace * Metal roof over storage area in rear courtyard		

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

- * Minor stucco chipping at front attic vent
- * Minor paint overspray on roof tiles

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

- a. Remove wood lattice an courtyard.
- b. Remove metal roof at storage area.

Building: 170 (OQ Type G)

Building No.: 170

Date Constructed: 1931

Area: 2554 sq. ft.

Historical Use: Senior Grade Officer family Housing

Current Use: Senior Grade Officer Family Housing

2. Historical and Architectural Significance: See general form for OQ Type G Buildings

3. Building Description/Condition: See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for OQ Type G Buildings. The aluminum screen door at the side porch is a non-contributing element.

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

* Broken and displaced roof tile

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

a. Replace aluminum screen door with wooden screen door.

Historical Use: Senior Grade Officer Family Housing

Building: 171 (OQ Type G)

Building No.: 171
Date Constructed: 1931

Current Use: Senior Garde Officer Family Housing

Area: 2554 sq. ft.

2. Historical and Architectural Significance:
See general form for OQ Type G Buildings

3. Building Description/Condition:

See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Non-Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior
* Metal flashing, unpainted galvanized, added above gutter at front porch * Canopy over rear terrace * Metal straps on chimney * Aluminum screen door to rear terrace	

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

- * Roof tile broken and displaced
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

a. Remove canopy at rear terrace.

Building: 172 (OQ Type G)

Building No.: 172

Date Constructed: 1931

Area: 2554 sq. ft.

Historical Use: Senior Grade Officer Family Housing Current Use: Senior Grade Officer Family Housing

2. Historical and Architectural Significance:

See general form for OQ Type G Buildings

3. Building Description/Condition:

See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for OQ Type G Buildings. The unique painted glass in steel frame at the crawl space access openings is a contributing element.

Non-Contributing Elements: Unique to this building. See general form for OQ Type ${\sf G}$ Buildings.

Exterior	Interior
* Front terrace side windows sealed off	* Valences at hall windows

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

- * Crack in rear terrace tile flooring
- * Foundation vent screen missing
- 6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

a. Restore front terrace windows.

Building No.: 173 Historical Use: Senior Grade Officer Family Housing
Date Constructed: 1931 Current Use: Senior Grade Officer Family Housing

Building: 173 (OQ Type G)

Area: 2554 sq. ft.

2. Historical and Architectural Significance: See general form for OQ Type G Buildings

3. Building Description/Condition:

See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior
* ca. 1935 enclosure of rear porch uses a pair of eight-light casement windows with four-light sidelight windows; one set of these on either side of door. Original pair of French doors and wood screen doors.	

Non-Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior
* Side porch screen door missing; main door not original	* Pieces added to interior of wood entry screen door

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

- * Palm tree growing against house wall
- * Roof tile missing
- * Paint overspray on roof tile

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

a. Restore side porch doors.

Building No.: 174

Date Constructed: 1931

Area: 2554 sq. ft.

Building: 174 (OQ Type G)

Historical Use: Senior Grade Officer Family Housing

Current Use: Senior Grade Officer Family Housing

2. Historical and Architectural Significance: See general form for OQ Type G Buildings

3. Building Description/Condition: See general form for OQ Type G Buildings

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior
* Steel windows at rear porch enclosure	* Marble shower enclosure; hexagonal shower tile

Non-Contributing Elements: Unique to this building. See general form for OQ Type G Buildings.

Exterior	Interior
* Wood archway over rear gate * Paint at front porch floor tile * Aluminum screen door at side porch	 * Paint at fireplace hearth * Shelves built into enclosed terrace window at right * Shelves built into two front porch windows

5. Maintenance Considerations:

Unique to this building. See general form for OQ Type G Buildings.

- * Paint on overspray roof tile
- * Dented gutter at front entry
- * Broken roof tile

6. Possible Restoration/Enhancement Measures:

Unique to this building. See general form for OQ Type G Buildings.

a. Replace non-contributing items.

Building No.: 176 Historical Use: Commanding Officer's Quarters
Date Constructed: 1932 Current Use: Commanding Officer's Quarters

Building: 176

Area: 3,915 sq. ft.

2. Historical and Architectural Significance:

Building 176 is a key contributor to this historic district from the historical as well as the architectural standpoint. The original and current quarters for the commanding officer, Building 176 is the largest and most elegant of all officers' quarters in the district. Prominently sited at the head of the parade ground, facing the headquarters building, it is literally at the heart of this historic district.

3. Building Description/Condition:

Building 176 is a 3915 sf hollow wall concrete residence. Building 176 is unique, with no equivalent among Officers' Quarters types at March Field. It is closest to Types D and E in that it is a hollow wall concrete building with long side wings, although its area is nearly 1 1/2 times as great and the building is U- rather than H-shaped. In some respects, Building 176 is the most heavily-altered of the Officers' Quarters. It is the only building, for example, to include a major rear patio enclosure, running the full length of the inner courtyard. In other respects, however, it is the least modified. It is the only residence, for example, to have all of its original windows and any of its original patio gates. It also retains most of the original architectural features which set it apart from the other Officers' Quarters, including vigas, unique attic vents, and a concrete patio wall. In general, the building retains a very high degree of integrity and is in a wonderful state of repair.

4. Inventory of Contributing and Non-Contributing Elements:

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Original wooden windows throughout * Copper gutters and downspouts * Radiator vents at eaves * Wood trim at exterior doors * Square foundation vents * Concrete splash guard * Half-round attic vents * Vigas and rake overhang * Wooden gates at garage and laundry * Steel gate at rear * Steel railings at front porch * Original front door and wooden screen * Guest room expansion	* Brick fireplace * Wood mantle * Built-in shelves by fireplace * Plaster ceilings, except kitchen and bath * Four panel interior doors * Picture moulding and base trim * Glazed patio doors with sidelights * Terrace doors from living room * Interior cabinets * Wooden casement windows at bath with exterior terra cotta screen * Oak flooring in maid's room

Non-Contributing Elements

Exterior	Interior
* Patio enclosure on three sides of inner courtyard * HV/AC unit * Window in-fill at right elevation * Chimney turbine	* Alterations to fireplace * Kitchen cabinets * Kitchen appliances and fixtures * Non-historic carpeting * New kitchen cabinets, floor * New bath cabinets, floor * Enlargement of master bedroom, requiring intrusive beam

5. Maintenance Considerations:

None noted, other than a few broken roof tiles.

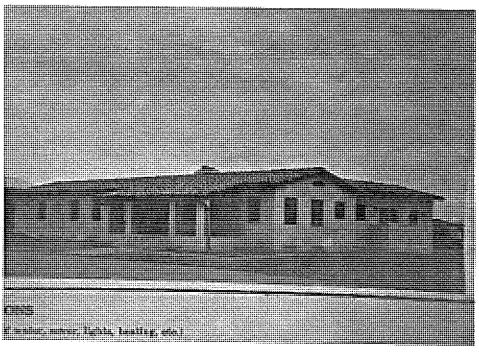
6. Possible Restoration/Enhancement Measures:

As discussed earlier, the historical integrity is generally very high for Building 176, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. Three non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); and acoustical tiles in kitchen and bath. As these items are replaced, every effort should be made to replicate or approximate the original design.

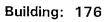
Priority restoration undertakings, linked to maintenance activities:

- 1. Return kitchen and bath ceiling to full height as acoustical tile ceilings deteriorate.
- 2. Restoration of hardwood floors as carpeting or parquet flooring deteriorate.
- 3. In the very long term, the base might consider removing the patio enclosure. This would be quite difficult to accomplish, however, because the enclosure is not lop-sided, with the walling in of the patio to the right and construction of the rear guest room. The purpose of removing the enclosure would be to restore the intended "indoor-outdoor" feeling to the patio and it is unlikely that feeling could be restored adequately, owing to major structural additions.

Selected Photograph of Building Detail



3.69 Commanding Officer's Quarters, 1932.





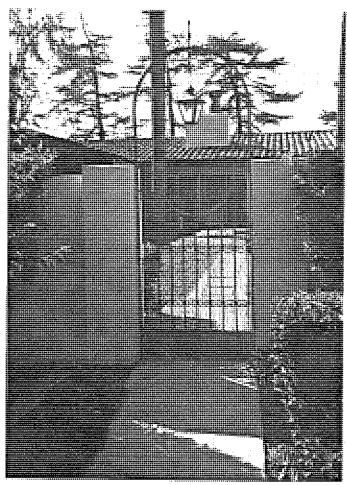
3.70 General view.



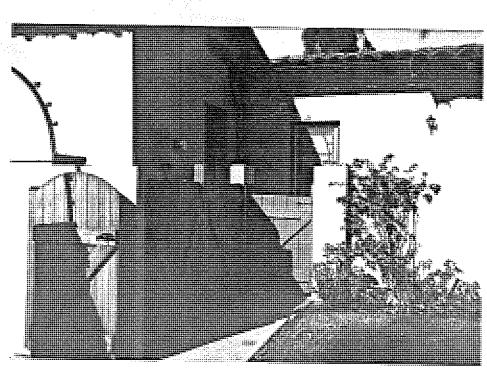
3.71 Inner courtyard, showing non-contributing enclosure and contributing half-round vents and vigas.

Selected Photographs of Building Detail





3.72 Rear gate.



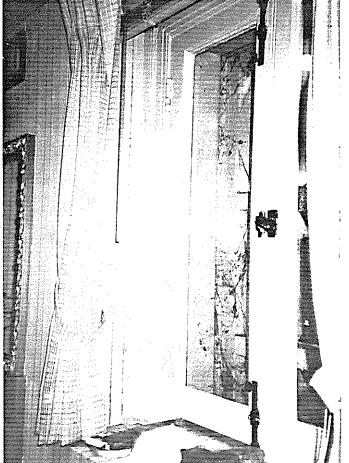
3.73 Wooden gates near garage.

Selected Photographs of Building Detail



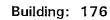
3.74 Fireplace and mantle.

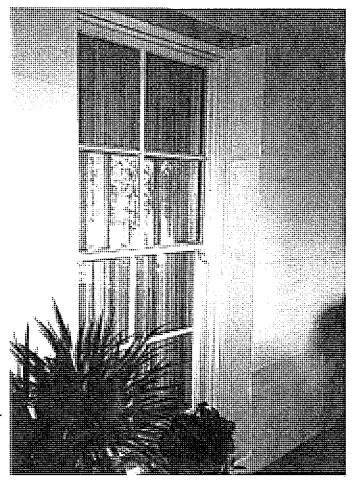
Building: 176



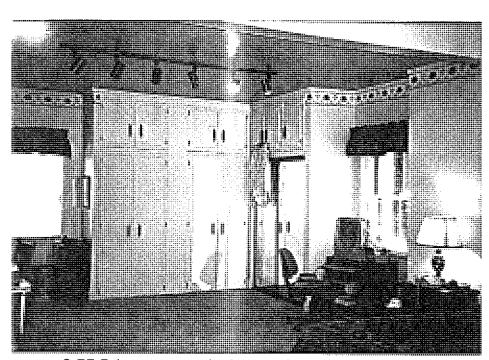
3.75 Wooden casement windows with terra cotta screen.

Selected Photographs of Building Detail





3.76 Original wooden double hung windows.



3.77 Enlargement to bedroom with new beam visible.



4. NCO Housing

Buildings Treated in this Section (by Building Number):

200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 328, 329, 330, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 381, 382, 383

4.1 General comments on integrity, maintenance, and restorative measures for NCO Housing units

The 73 NCO Quarters represent a key element of the historic district. The buildings occupy nearly all of the southeastern corner of the district, account for more than one-third of the contributing buildings and more than half the residential units, commonly called "Green Acres." This high percentage suggests that protection and restoration of the NCO Quarters should be given a high priority in the overall program to protect and restore the larger historic district.

The NCO Quarters are built around three basic units -- A, B, and C. Each building type is discussed in detail below. In addition to individual buildings, the NCO residential area is important because of the courtyard plan used in laying out these buildings. Although the Officers' Quarters include some elements of courtyard design, the NCO area is especially appealing for the formality and elegance of the courtyard lay-out.

There is a high degree of uniformity within the NCO Quarters, in terms of the basic building types and in terms of modifications over time, maintenance problems, and appropriate restoration strategies. The 73 NCO Quarters comprise three basic types -- Types A, B, and C -- with minor variations (A-1, A-2, B-1, B-2, C-1, and C-2). The 1 and 2 variants are simply mirror images of one another. Generally speaking, the buildings have been maintained and modified in a uniform manner by building type and as a group. In other words, a modification to one Type A building will appear in all of the Type A buildings, and so forth. Indeed, most changes to these buildings have been made uniformly to all three major types. Maintenance problems are nearly uniform as well, not surprising, given the uniform nature of the buildings and the manner in which they have been maintained. As always, there are exceptions to these rules, exceptions which are noted in the attached individual sheets.

Because the NCO Quarters are so much the same, it is appropriate to make general observations which apply to the buildings generally. These observations are augmented by a more detailed discussion of each NCO type, followed in turn by specific building inventory sheets which apply to the individual buildings.

The NCO Quarters were built quickly in 1930 and 1931, except for a small cluster of buildings (Buildings 381, 382, and 383) which were built in 1934. Although room arrangements differ, the three types share a great deal. All are built of hollow wall concrete; all include Mission tile roofs; each has six rooms (two bedrooms, one bath, kitchen, living/dining room, and a sleeping porch) as well as a small laundry. The areas of the three types are virtually identical, with net areas of 924, 956, and 950 sf for Types A, B, and C respectively. NCO houses completed by April 1930 contained wood-frame casement windows, opening out. Those completed in December 1930 or later had steel window casements, opening out, topped by a four-light fixed transom.

The three NCO types are arranged in a predictable manner. Types A and C are connected by concrete curtain walls in a U-shaped courtyard, with C type buildings at either end and an A type in the middle, set back at the rear of the courtyard. A freestanding B type building separates each group of courtyards. Thus, the pattern, with rare exceptions, is B, C, A, and C. For this reason, roughly half of the NCO Quarters are Type C, with the remaining 50 percent divided between Types A and B. This aspect of the NCO area -- the courtyard lay-out -- is completely intact and is a key element of the integrity of the area. The connecting curtain walls are also almost completely intact. These walls are integrated structurally with the C and A building types, connecting with laundry and storage rooms.

In terms of maintenance considerations, the NCO area suffers from a series of repetitive problems, common to nearly all buildings in the area. The most pressing problem is that of leakage in flat-roofed sections of the A and C buildings. This problem is well-known among maintenance staff and various solutions have been tried, with varying degrees of success. A second common problem is that of missing, loose, and misaligned roof tiles. A third common and serious problem concerns the front railings on types B and C. These railings were installed with a horizontal bar embedded just below the surface of the concrete. If the rails are allowed to rust, the rust expands to that horizontal bar, causing discoloration and ultimately, spalling of the concrete. This problem is found elsewhere on the base, including the Officers' Quarters and the old hospital building, but is most acute in the NCO area.

In terms of restoration projects, three maintenance projects could yield great restoration benefits: reversal of intrusive formica surfaces in kitchen areas; removing dropped ceilings in kitchens and baths; and replacing inappropriate windows. These actions are treated as maintenance considerations because all of these materials -- formica in the kitchens, acoustical tiles in kitchens and baths, and windows -- will need to be replaced in the near future.

Other "beyond compliance" type actions that might be considered include: restoring the original hardwood floors; consideration of rebuilding the handsome original kitchen and bath cabinetry (plans for these exist on base); and rebuilding the handsome breakfast nook benches and tables.

4.2 Contributing Elements of the NCO Area

Courtyard plan: The formal series of courtyards for the NCO housing area is a further example of the historic importance of site planning in the March Field historic district. Not only was the Mission Style used architecturally, but also in the site planning to provide an organizing scheme for the housing. The Mediterranean courtyard provides a social function in grouping the entrances of the housing. In addition, the groupings tend to break down what could have been long blocks of repeated houses. The courtyard walls not only serve to link the small houses into a larger architectural unit, but also provide a separation between the entry court and the rear yards.

<u>Concrete curtain walls</u>: The primary missing elements of the courtyard walls are the wooden gates which are shown on the original drawings for the houses, but not yet installed at the time of the historic photos. (One can see field evidence of the gate jambs having been installed.) The gates complete the separation of the courtyard and rear yard areas and also provide detail to the large stucco wall areas.

4.3 Non-Contributing Elements of the NCO Area

See individual building forms; none for NCO area generally.

4.4 General Condition of Buildings within the NCO Area

All the NCO housing was built at approximately the same time, and virtually all maintenance and modifications have been authorized for the NCO housing as a group. The condition of the houses is uniformly quite good. It is important to note that all the residents we met during the site inventory period were very pleased with their houses. They all seemed to recognize the buildings' historic value and also very much valued the landscaping.

Generally, the one attic and crawl space we viewed had rafters and floor joists in very good condition. Evidence was seen of past crawl space flooding.

It should be noted that this review is limited to historic items and is not intended as an inspection of health, safety, structural and building code issues. Since the buildings are relatively old, a review of that type is advisable.

4.5 Maintenance Considerations for NCO Area

A number of maintenance concerns were observed within the NCO area.

Repair roof tiles: Perhaps the highest priority consideration is to care for the tile roofs. While the tiles generally are in good condition, most of the houses have broken, missing or displaced tiles which will eventually lead to degradation of structural elements and interior finishes. Since the tiles are clay, they are very difficult to clean where paint overspray occurs. Painting contracts need specifications that do not allow paint on adjacent surfaces and limit spraying during windy conditions. Field review of on-going work is necessary.

Remove intrusive landscaping: A second general consideration is to remove landscaping, especially volunteer palm trees, that are growing directly adjacent to house walls. The wood roof overhangs and especially the noted copper gutters can be damaged by the fast-growing palms.

Repair rusted front rails, spalling concrete on porches: These front railings occur only on NCO types B and C. These railings were installed with a horizontal bar embedded just below the surface of the concrete. If the rails are allowed to rust, the rust expands to that horizontal bar, causing discoloration and ultimately to spalling of the concrete.

Repair cracked concrete walls: Where concrete walls are noted as having cracks and/or steel reinforcing bars exposed, these items may seem minor when viewed on site. The concern is for the structural integrity of the walls. If water is able to penetrate into the walls and rust out the steel reinforcing, the walls will lose their tensile strength and may be damaged under high winds or earthquake stresses. Concrete filler specifically formulated for filling narrow cracks is advised.

<u>Install GFI electrical outlet</u>: Some exterior electrical receptacles appear to be lacking a "ground fault interrupting circuit." This is a safety hazard and does not comply with current codes. This may apply to interior kitchen and bath locations as well.

Repair and clean attic vents: Attic vent screens on many of the houses are either missing, torn, or sometimes are painted nearly solid so as to limit air circulation. Attic air circulation aids in summer cooling, and in winter, limits the build-up of moisture that may cause dry rot. The lack of screens can allow birds and other animals to nest in the attic causing unsanitary conditions.

Ensure foundation vents are water-safe: At some houses, foundation vents are close to ground level, potentially allowing storm water to enter the crawl space. One remedy would be to provide a low retaining wall just above ground level (so as not to alter the visual/historic character of the houses) and provide a dry well on the house side of the low wall. This strategy should be verified, sized, and detailed by a soils engineer.

Ensure operable casement windows: Another item of note is that many of the residents seem to be closing their casement windows without properly operating the latch. While this has an impact on heating and cooling costs, the more serous consequence may be rain penetration to the interior spaces. With so many of the houses unoccupied during the daytime, rainwater could come into the house for a number of hours before it is discovered. A simple note regarding this in the base newsletter may avoid damage to interior finishes.

4.6 Energy Considerations for NCO Area

Energy conservation versus historic preservation: When it is necessary to replace any building component which has both an energy use and visual/historic impact, it should be a standard procedure to review a series of alternative strategies by preparing a computer simulation of the thermal performance and energy use costs of the house. For example, when replacing windows, which have a very significant influence on energy costs, the performance of the house(s) with different window options can be modeled for the Riverside climate. Both single and insulated (double) glazing payback can be studied with an inflation factor built in for increasing energy costs over time. The size and appearance of steel window frames and muntin bars can be significantly different for single and insulated glazing; this difference has historic preservation consequences. (Yet all new windows would have weatherstripping, a significant improvement over the existing unweather-stripped metal windows.)

In doing such an analysis the goal is to help quantify the benefits (energy savings) and costs (additional initial cost plus historic implications) of a building modification in the mild Riverside climate. To be thorough, the analysis should look at a single component, such as the windows in the above example, in the context of other alternative energy strategies. Added attic insulation, as another example, may be much more cost effective and less visually intrusive than insulated glazing. (One attic we entered had only about one inch of rock wool insulation.) Other options to consider in the hot summer, mild winter Riverside climate includes interior summer window shading with reflective insulating blinds or draperies; radiant barriers on the underside of the attic rafters; higher efficiency, insulated (or tankless) water heaters; higher efficiency heating and cooling systems; and under floor insulation.

This is an inexpensive task, and since there are so few different types of houses, this is an extremely cost effective procedure. The cost to study a number of options is also very minor once the building characteristics are entered into the program. After the chosen strategies are installed, some, preferably unoccupied houses could be monitored and compared to prior utility bills to verify the accuracy of the results. (Many California utility companies have grant programs to fund studies such as this.)

4.7 Potential Restoration Projects within NCO Area

In terms of restoration projects, three maintenance projects could yield great restoration benefits: reversal of intrusive formica surfaces in kitchen areas; removing dropped ceilings in kitchens and baths; and replacing inappropriate windows. These actions are treated as maintenance considerations because all of these materials -- formica in the kitchens, acoustical tiles in kitchens and baths, and windows -- will need to be replaced in the near future.

The formica surface is intrusive chiefly because it was installed in such a way that it blocks a portion of the kitchen window, blocking view out of the window and presenting an unattractive view of particle board from the exterior. When the kitchen surface is replaced, the new surface can be installed with a small valley at the window, solving this problem easily and inexpensively. Similarly, removal of acoustical tile in the kitchen and baths would easily and inexpensively restore the intended appearance of a substantial proportion of the square footage of these buildings, at little cost in money or utility. Restoring the windows will be more expensive and should be considered only when the existing windows wear out. The restoration expense in this case is simply the <u>additional</u> cost of using windows which approximate the original steel or wooden casements.

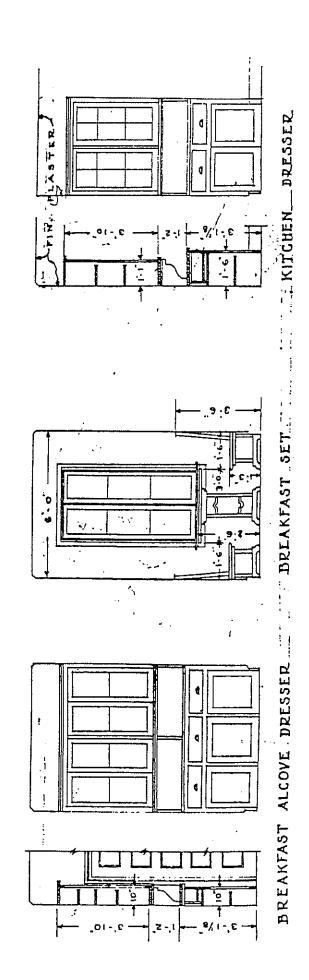
<u>Potential restoration projects within the NCO area</u>: The residents of the NCO housing **a**re quite positive about their homes including such general factors as the site planning and landscaping, the thermal performance of the houses in the hot months and the historic detailing.

Given that the future of the NCO housing area is uncertain, it may be possible to take advantage of the historic interest of current residents and/or future owners. The first step would be to make available to the residents copies of historic drawings (and possibly summaries of our report) to enhance recognition of, and preservation of historic features.

A further step would be to provide opportunities for housing owners to restore various renovations to "original" conditions. This could be made much more affordable by having contractors provide itemized cost packages to all the owners, thereby giving the owners the ability to choose which items would best serve their individual needs, yet assure that the detailing would be kept reasonably close to original conditions. The primary options for this include:

- Replacement of the existing exterior heating and cooling units and water heaters with smaller units primarily located in interior spaces; the original heaters are in the sub-floor crawl spaces. (See energy section for more discussion of this.)
- Removal, as noted, of the suspended ceilings in kitchens and baths, thereby raising them to former heights. (If there is a concern for retaining current lighting levels with high ceilings, suspended light fixtures can be used to bring the light down closer to work surfaces.)
- Providing copies of the original built-in dining tables and dressers in some of the house types. (See **Figure 7**.)
- Reworking of modified kitchen cabinets, as noted, to remove barriers in front of windows.

en de la companya de la co



Historic design plan of Breakfast Alcove Dresser, Breakfast Set, and Kitchen Dresser for NCO Quarters Type B-1 and C-1. July 1930. Figure 7

- Removal of some floor coverings to expose the original hardwood.
- Rebuilding the handsome original kitchen and bath cabinetry (plans for these exist on base)
- Removal of exterior electrical conduits, particularly those installed in attic vents for B type buildings.
- Remove inoperable television antennae and antennae straps on chimneys. These appear to be superseded by cable television and are intrusive and unnecessary.

Another consideration is to provide a checklist of items to review when houses change occupants. The list could include floor finishes, suspended ceilings, etc. Obviously the best time to do restoration work is when the houses are unoccupied.

NCO Building Type A

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Date Constructed: 1930-1934 Area: 924 sf

2. Historical and Architectural Significance

The NCO Type A home is one of the original building types from the early years of construction at March AFB. There is a total of 19 NCO Type A buildings within the historic district. All are built of the hollow wall concrete method that is a major part of the significance of this historic district. All are in the Mission Revival style that defines the character of the historic district.

3. Building Description/Condition

Description: NCO Building Type A is a 924 sf single story residence. It is a standard type for March AFB, sometimes designated by subtypes A-1 and A-2. The Type A building is a one-story hollow-wall concrete residence with a Mission tile side gabled roof. It includes a small porch overhang which is an extension of the slope of the primary gable roof, centered on the facade with arched openings at the sides. It is linked at both sides by concrete curtain walls, joining it to the C-type buildings. This curtain wall links with small rooms at either side of the A building. At one side or the other (depending upon whether it is an A-1 or A-2), the A building includes a small rear extension. Windows are tall metal casements except in the two small side rooms. This building type features a triangular attic vent pattern at the side gable ends.

The NCO Type A buildings were originally constructed with two types of windows. Those completed before April 1930 had wood-frame windows with large panes of glass (Buildings 202, 203, 210, 211, 218, and 219). The remaining NCO Type A buildings, completed after November 1930, all had steel frame windows with smaller panes. The attached historic photographs show the different window treatment on the main facade. Building 203, completed in March 1930, possessed wooden casement windows with three lights in each window. Building 382, completed in 1934, has eight-light steel casement windows with a four-light transom above. (Photographs 4.1 and 4.2)

The NCO Type A building retains many important interior and exterior features. Among its important exterior features are the original rough form board concrete surface, the tile roof, its original four vertical panel front door, and its sturdy and decorative copper gutter and downspout system. The interior includes many pleasant and functional original features, including its original fireplace and mantle, built-in book shelves and sideboard, as well as a small telephone niche in the hallway. There are few major intrusions upon its historical integrity, the most notable being replacement of all original wooden and steel sash with aluminum casements, the installation of dropped acoustical tile ceilings in the bath and kitchen, and non-historic floor coverings (carpeting or parquet) over the original oak planking.

General Condition: See NCO housing summary for general condition information.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Round clay vents in gable ends * Vertical grooved wood front door * Copper gutters and downspouts * Concrete splash guard * Scalloped rafter tails * Courtyard walls * Front porch brackets * Radiator vents * Some houses: four-light, two-panel exterior laundry door	* Brick fireplace * Wood mantle * Built-in shelves by fireplace * Built-in sideboard, dinning room * Built-in telephone niche * Plaster ceilings, except kitchen and bath * Five panel interior doors * Picture moulding, door and base trim * Flooring in storage closet * Sun porch door transom

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * Replacement rear door * Concrete cover over crawl space vents * Electrical conduit in gable end vent * Exterior HV/AC unit * Exterior water heater * Miscellaneous straps on chimney * Aluminum screen entry doors	* Dropped acoustic tile ceilings in kitchen and bath * Intrusion of kitchen countertop into kitchen window opening * Kitchen cabinets * Kitchen appliances and fixtures * Non-historic floor covering * Dining-living room wall removed * Paint on brick fireplace * HV/AC floor grills; radiators removed

5. Maintenance Considerations

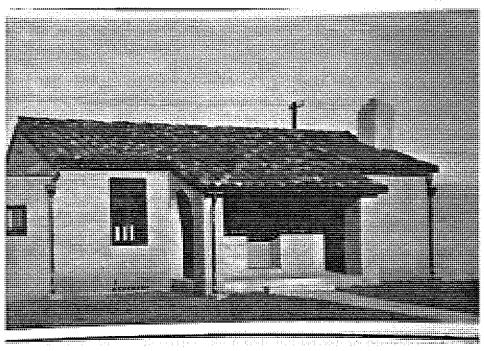
See individual building forms.

6. Possible Restoration/Enhancement Measures

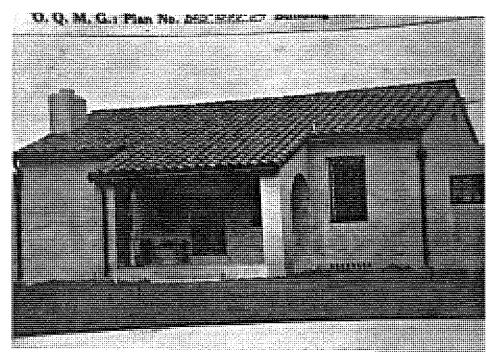
As discussed earlier, the historical integrity is generally very high for the NCO Type A buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the NCO Type A buildings, four non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath ceilings; and formica kitchen counters. As these items are replaced, every effort should be made to replicate or approximate the original design. For example, the formica kitchen counters currently intrude into the kitchen window opening, an intrusion that is visible from the exterior and which blocks natural lighting. At no or little extra cost, the replacement could be customized to respect the full window opening.

Priority restoration undertakings, linked to maintenance activities:

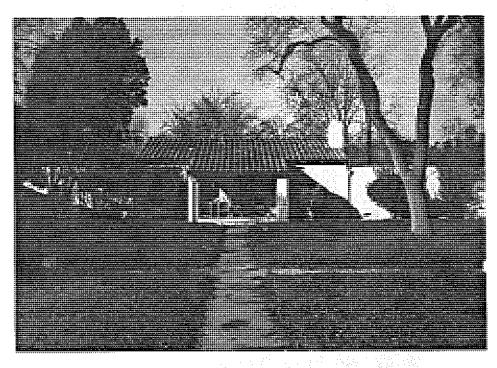
- 1. Replace formica kitchen counters, respecting kitchen window openings.
- 2. Return kitchen and bath ceilings to full height as acoustical tile ceilings deteriorate.
- 3. As windows are scheduled for replacement, replace aluminum sash with wooden or steel casements.
- 4. Restoration of hardwood floors as carpeting or parquet flooring deteriorate.



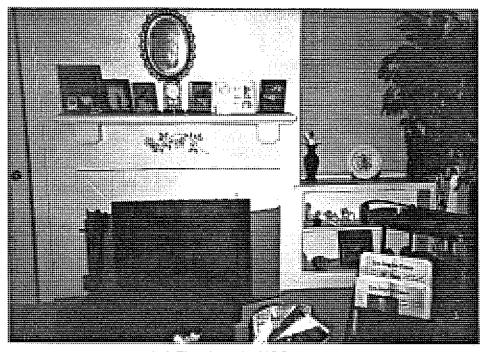
4.1 Type A NCO Quarters, 1930 (Building 203).



4.2 Type A NCO Quarters, 1934 (Building 382).



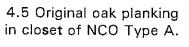
4.3 General view of NCO housing, Type A.



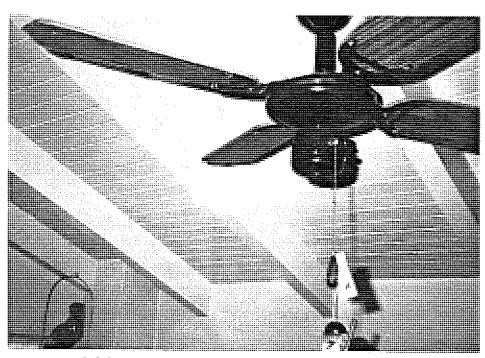
4.4 Fireplace in NCO Type A.

Selected Photographs of Building Detail

NCO Building Type A







4.6 Exposed rafters in sunroom of NCO Type A.

Building: 202 (NCO Type A)

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Building No.: 202

Date Constructed: 1930 (March)

Area: 924 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

- 3. Building Description/Condition:

 See general form for NCO Type A Buildings
- 4. Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type A Buildings
- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tile broken, displaced
 - * Crack in wall at right archway
 - * Tree growing against archway wall
 - * Sunroom window putty peeling off
 - * Wall crack at rear window
- 6. Possible Restoration/Enhancement Measures:

 See general form for NCO Type A Buildings.

United and United NCO Family Haveing

Building: 203 (NCO Type A)

Building No.: 203 Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

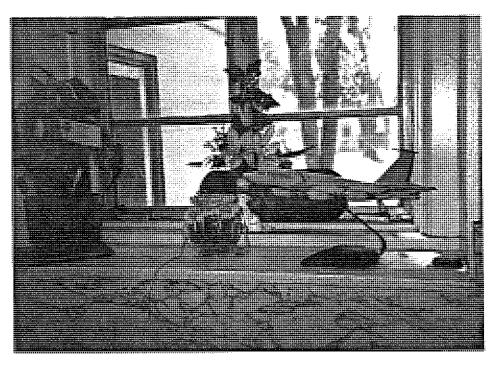
See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type A Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Window leaks
 - * Crack in archway wall
 - * Sunroom gutter deformed
 - * Roof tile broken
- 6. Possible Restoration/Enhancement Measures:

 See general form for NCO Type A Buildings.

Selected Photograph of Building Detail



4.7 Kitchen counter, note that the formica does not intrude into window.

Building: 210 (NCO Type A)

Building No.: 210

Date Constructed: 1930 (March)

Area: 924 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. Also note that the middle and

right front gutter have been replaced and wood brackets added to the rear wall.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tiles broken, displaced
 - * Left front gutter deformed
 - * Cracks in wall near both archways
 - * Vent screens missing
 - * Vent tile broken, left side
 - * Crawl space access door deteriorating
 - * Crack in wall near sunroom window
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 211 (NCO Type A)

Building No.: 211

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition: See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. This building retains an original four-light, two-panel laundry door, one of the few such doors remaining in the NCO area.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tile broken, displaced
 - * Split in porch wood beam
 - * Wall paint sprayed on front rafters and roof tiles
 - * Deteriorated eave sheathing, front
 - * Crack in archway wall
 - * Rear splash block displaced
 - * Vent screens missing
 - * Crawl space screen needs repair
 - * Laundry door light damaged
 - * Window putty damaged
 - * Window sprung
- 6. Possible Restoration/Enhancement Measures:

See general form for NCO Type A Buildings.

Building: 218 (NCO Type A)

Building No.: 218

Date Constructed: 1930 (March)

Area: 924 sq. ft.

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. This building retains an original four-light, two-panel laundry door, one of the few such doors remaining in the NCO area.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tile broken, displaced
 - * Stains on right front downspout
 - * Re-bar exposed, right concrete pillar
 - * Crack in front wall near right archway
 - * Paint chipped off near archway, and at other locations
 - * Paint overspray on roof tile
 - * Window putty in poor condition
 - * Vent screens damaged
- 6. Possible Restoration/Enhancement Measures:

See general form for NCO Type A Buildings.

Building: 219 (NCO Type A)

Building No.: 219

Date Constructed: 1930 (March)

Area: 924 sq. ft.

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. The antenna strap on the chimney is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tiles broken, displaced
 - * Crack in wall near archway
 - * Vent screens missing
 - * Window putty damaged
 - * Palm tree growing against wall, roof
 - * Spalling concrete, exposed re-bar in left pillar of porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building No.: 224 Historical Use: NCO Family Housing Current Use: NCO Family Housing

Building: 224 (NCO Type A)

Building: 224 (NCO Type A)

Date Constructed: 1931

Area: 924 sq. ft.

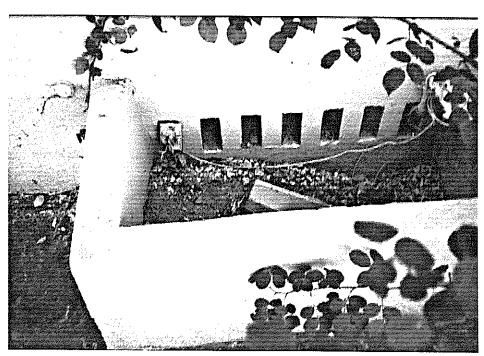
2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition: See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type A Buildings. The aluminum screen at the entry is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Crack in wall, joint of laundry room
 - * Attic vent screen torn
 - * Exterior of laundry door delaminating
 - * Roof tiles displaced
 - * Chimney crack
 - * Re-bar exposed, wall near archway
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Selected Photograph of Building Detail



4.8 Concrete dam over foundation vent holes. This solution is less intrusive than vertical concrete boxes, see photograph of Building 215.

Building: 225 (NCO Type A)

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Building No.: 225

Date Constructed: 1930 (December)

Area: 924 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type A Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tile broken
 - * Re-bar exposed right side wall
 - * Paint on roof tile
 - * Plumbing leak, RCV box near alley
 - * Sunroom roof tile missing
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 232 (NCO Type A)

Building No.: 232 Historical Use: NCO Family Housing
Date Constructed: 1931 Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance:

See general form for NCO Type A Buildings

3. Building Description/Condition:

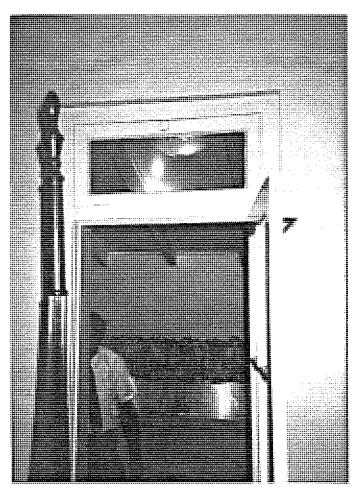
See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. The television antenna mounting bracket is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Laundry ceiling shows water damage
 - * Fireplace flue handle missing
 - * Re-bar exposed front pillar
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 232 (NCO Type A)



4.9 Door with transom leading to sunroom.

Building: 233 (NCO Type A)

Building No.: 233

Historical Use: NCO Family Housing Date Constructed: 1930 (December)

Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition: See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type A Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Wall cracked, front right downspout
 - * Paint overspray on roof tile
 - * Crawl space access door deteriorating
 - * Kitchen sink vent needs extending
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 240 (NCO Type A)

Building No.: 240

Date Constructed: 1931

Area: 924 sq. ft.

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:

See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type A Buildings. The slab laundry door is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Laundry roof leak
 - * Minor roof tile displacement
 - * Unused gas line near HV/AC unit
 - * Attic vents painted almost closed
 - * Leaking roof in storage room adjoining living room
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

N. 241

Building: 241 (NCO Type A)

Building No.: 241 Historical Use: NCO Family Housing Date Constructed: 1930 (December) Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. The aluminum screen at the entry and the television antenna mounting strap are non-contributing elements.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Cracks in front wall
 - * Poor configuration of roof downspout to flat roof scupper
 - * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 248 (NCO Type A)

Building No.: 248

Date Constructed: 1931

Area: 924 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Crack in sunroom wall
 - * Re-bar exposed, front porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 249 (NCO Type A)

Building No.: 249

Date Constructed: 1931

Area: 924 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type A Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Laundry roof leak
 - * Paint on ceiling metal trim in bath
 - * Concrete wall re-bar exposed
 - * Roof tile displaced
 - * Crawl space access door deteriorating
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 332 (NCO Type A)

Building No.: 332

Date Constructed: 1931

Area: 924 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition: See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type A Buildings. The roof tiles placed on the entry parapet walls are a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Crack in wall near front downspout
 - * Roof tiles broken, displaced at rear
 - * Large hole in wall at hose bib
 - * Remove wood, left attic vents
 - * Patch attic vent screen
 - * Crack in wall, left front
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building No.: 337 Historical Use: NCO Family Housing

Building: 337 (NCO Type A)

Date Constructed: 1931 Current Use: NCO Family Housing Area: 924 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

3. Building Description/Condition:

See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type A Buildings. The television antenna mounting strap is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tiles broken, displaced
 - * Storage and laundry roofs leak
 - * Trim of crawl space access door deteriorating
 - * Crack in wall near front left downspout
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 341 NCO Type A)

Building No.: 341

Date Constructed: 1931

Area: 924 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

- 2. Historical and Architectural Significance:
 See general form for NCO Type A Buildings
- 3. Building Description/Condition:

 See general form for NCO Type A Buildings
- 4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type A Buildings
- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Spalling concrete, laundry room parapet
 - * Vent screen missing
 - * Roof tile broken, displaced, missing
 - * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building No.: 345 Historical Use: NCO Family Housing
Date Constructed: 1931 Current Use: NCO Family Housing

Building: 345 (NCO Type A)

Area: 924 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type A Buildings

 Building Description/Condition: See general form for NCO Type A Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type A Buildings. The window cut into the storage room wall is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Significant crack, left front wall
 - * Dryer vent cover missing
 - * Roof tile displaced, missing
 - * Front gutter deformed
 - * Vent screens missing
 - * Spalling concrete near archway
 - * Re-bar exposed, spalling concrete, porch pillar
 - * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

Building: 382 (NCO Type A)

Building No.: 382

Historical Use: NCO Family Housing Date Constructed: 1934 Current Use: NCO Family Housing

Area: 924 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type A Buildings

3. Building Description/Condition: See general form for NCO Type A Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type A Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type A Buildings.
 - * Roof tile broken, missing
 - * Large hole drilled into front right wall
 - * Re-bar exposed and rusting, front wall, two locations
 - * Vent screens missing
 - * Several holes drilled into rear wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type A Buildings.

NCO Building Type B

Historical Use: NCO Family Housing Current Use: NCO Family Housing Date Constructed: 1930-4

Area: 956 sf

2. Historical and Architectural Significance

The NCO Type B is one of 73 Non-Commissioned Officer Quarters built during the initial years of construction at March AFB. There is a total of 15 NCO Type B homes in the historic district. All are built of the hollow wall concrete method that is a major part of the significance of this historic district. All are in the Mission Revival style that defines the character of the historic district.

3. Building Description/Condition

Description: The NCO Building Type B is a 956 sf single story residence. It is a standard type for March AFB, sometimes designated subtype B-1 and B-2. The Type B building is a one-story hollow-wall concrete residence with a Mission tile side gabled roof. There are two variations on a basic "B" plan, B-1 and B-2. At one side (left for B1, right for B2) is a covered porch with an intersecting gable roof and arched openings on three sides. The four terra cotta vents for this gable are set in a diamond pattern. Opposite the covered porch is a rear and side extension. The ridge for the gable roof on this extension is located just behind the ridge for the main building. The rear slope of the roof is very long, extending to a rear eave line that is less than half the height of the front. Most windows in this building are tall metal casements. A round vent is located at the gable end opposite the porch. Like the NCO A Type, the NCO B Type residences completed before April 1930 had wood-frame windows (Buildings 206, 207, 214, and 215). After that date, the Air Corps installed steel window casements on all new NCO residences (Photographs 4.10 and 4.11).

Among the three NCO types, the B type includes the highest incidence of subtle variations. The most notable variation involves the gable end. Ordinarily, it is flush with the wall surface and is the same rough form board texture. In some instances, however, the gable end is a smooth plaster surface and projects more than one inch from the rest of the wall surface. On those buildings with smooth gable ends, the rafters are hidden behind an eave board; ordinarily, the rafters finish in decorative rafter tails.

The NCO Type B building retains many important interior and exterior features. Among its important exterior features are the original rough form board concrete surface, the tile roof, its original front door, and its sturdy and decorative copper gutter and downspout system. The interior includes many pleasant and functional original features, including its original fireplace and mantle, built in book shelves and sideboard, as well as a small telephone niche in the hallway. There are few major intrusions upon its historical integrity, the most notable being replacement of all original wood or steel sash with aluminum casements, the installation of dropped acoustical tile ceilings in the bath and kitchen, and non-historic floor coverings (carpeting or parquet) over the original oak planking. In all NCO Type B buildings, electrical conduits have been inserted into the tile vents at the front gable ends, creating an awkward and very prominent intrusion.

General Condition: See the NCO housing summary for the general condition of the buildings.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Combination of large round, recessed vents and round clay tile attic vents in gable ends * Vertical grooved wood front door * Copper gutters and downspouts * Concrete splash guard below downspouts * Steel porch railing * Stucco gable end and eave moulding * Radiator vents at eave line above windows	* Brick fireplace with wood mantle * Built-in shelves by fireplace * Built-in sideboard, dinning room * Built-in telephone niche * Plaster ceilings, except kitchen and bath * Five panel interior doors * Picture moulding, door and base trim * Transom at sun room door * Alcoves under windows that once housed radiators

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * Replacement rear door * Concrete cover over crawl space vents * Electrical conduit in gable end vent * Exterior HV/AC unit and water heater * T.V. antenna straps and brackets	* Dropped acoustic tile ceilings in kitchen and bath * Intrusion of kitchen countertop into kitchen window opening * Replacement kitchen and laundry cabinets * Kitchen appliances and fixtures * Non-historic floor covering * Dining area built-in table and seating removed * Paint on brick fireplace * Radiators removed * HV/AC floor grills

5. Maintenance Considerations

See individual building forms. The porch railings are especially rusted on many NCO Type B houses.

6. Possible Restoration/Enhancement Measures

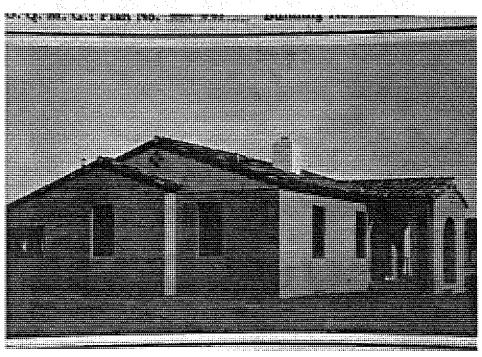
As discussed earlier, the historical integrity is generally very high for the NCO B buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the NCO B type buildings, five non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath; and formica kitchen counters; electrical conduits installed in gable end vents. As these items are replaced, every effort should be made to replicate or approximate the original design. For example, the formica kitchen counters currently intrude into the kitchen window opening, an intrusion that is visible from the exterior and which block natural lighting. At no or little extra cost, the replacement could be customized to respect the full window opening.

Priority restoration undertakings, linked to maintenance activities:

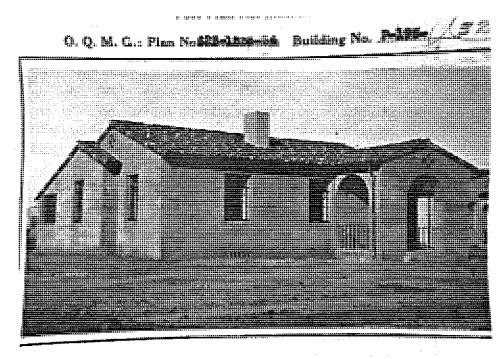
- 1. Replace formica kitchen counters, respecting kitchen window openings.
- 2. Return kitchen and bath ceiling to full height as acoustical tile ceiling deteriorate.
- 3. As windows are scheduled for replacement, replace aluminum sash with wooden or steel casements. Historical wooden casements contained three lights on each window. Steel casements had eight lights per window with a four-light transom above.
- 4. Restoration of hardwood floors as carpeting a parquet flooring deteriorate.
- 5. Remove electrical conduits from gable end attic vents.

Selected Photographs of Building Detail

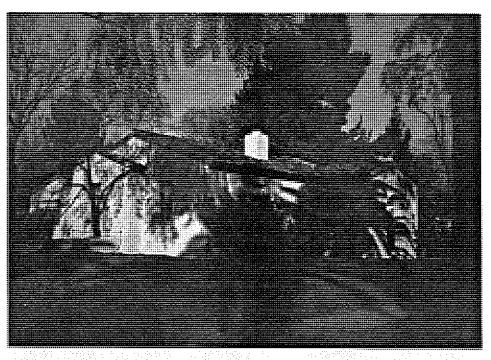
NCO Building Type B



4.10 Type B NCO Quarters, completed March 1930 (Building 206).



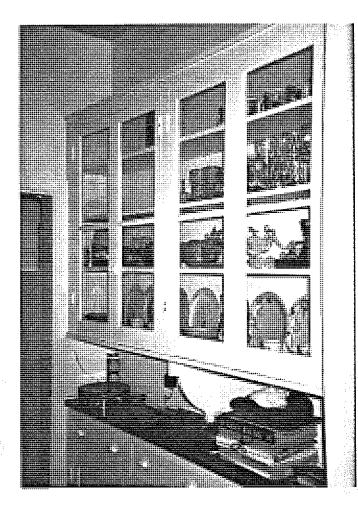
4.11 Type B NCO Quarters, completed September 1931 (Building 329).



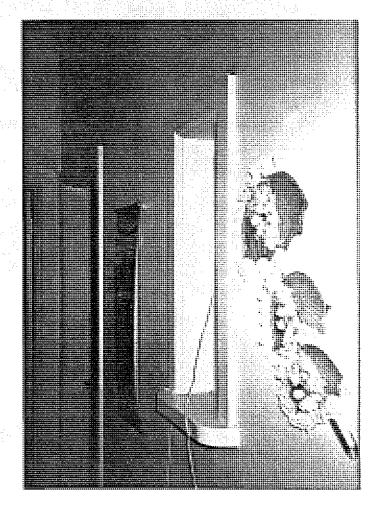
4.12 General view of NCO Type B.

Selected Photographs of Building Detail

NCO Building Type B



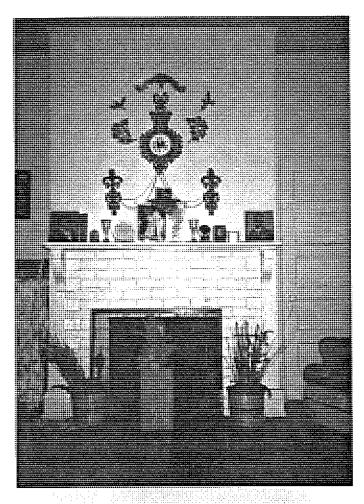
4.13 Built-in cabinets, living room NCO Type B.



4.14 Telephone niche NCO Type B.

Selected Photographs of Building Detail

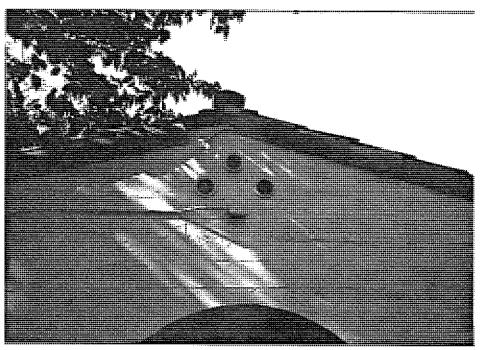
NCO Building Type B



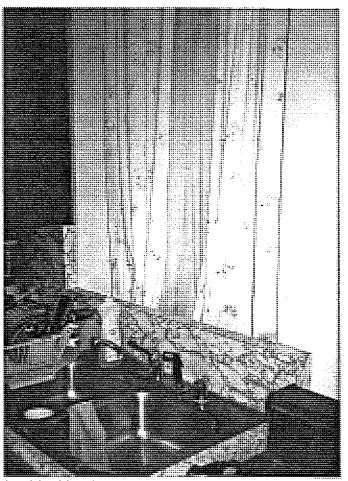
4.15 Fireplace and mantle NCO Type B.



4.16 Rusted rails and spalled concrete at front porch NCO Type B.



4.17 Conduit in vents, front gable end NCO Type B.



4.18 Formica blocking lower portion of kitchen window NCO Type B.

Building: 206 (NCO Type B)

Building No.: 206

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 956 sf

2. Historical and Architectural Significance: See general form for NCO Type B Buildings

3. Building Description/Condition: See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings. The television antenna is a noncontributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Bent gutter on right side
 - * Partially missing ridge mortar cap at gable end
 - * Broken, displaced roof tile
 - * Cracks in rear wall
 - * No "bird stop" in eave of roof tile
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building: 207 (NCO Type B)

Building No.: 207

Date Constructed: 1930 (March)

Area: 956 sf

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type B Buildings. The four-light, two-panel back door, the stucco gable end, and the eave board pattern are all contributing elements.

- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Broken tile on front porch and roof
 - * Missing window putty
 - * Deteriorating crawl space access door
 - * Split eave board on sunroom
 - * Roof tile gable end, left wall unfinished
 - * 2' gutter section missing at left side
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building: 214 (NCO Type B)

Historical Use: NCO Family Housing

Building No.: 214

Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 956 sf

2. Historical and Architectural Significance: See general form for NCO Type B Buildings

3. Building Description/Condition: See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings. The wood piece added to the fascia at the front left wall in a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Rear door light damaged
 - * Laundry vent cover broken off
 - * Broken, displaced roof tile
 - * Window glazing putty in poor repair
 - * Lower sunroom downspout falling off
 - * Paint damaged: sunroom wall, left wall, and bottom front wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building No.: 215 Historical Use: NCO Family Housing

Building: 215 (NCO Type B)

Building: 215 (NCO Type B)

Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

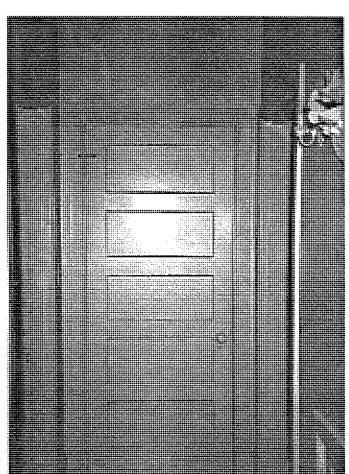
3. Building Description/Condition:

See general form for NCO Type B Buildings

- 4. Inventory of Contributing and Non-Contributing Elements:

 See general form for NCO Type B Buildings
- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Roof leak, flat area over utility
 - * Minor concrete cracking at window corners
- 6. Possible Restoration/Enhancement Measures:
 See general form for NCO Type B Buildings.

Selected Photograph of Building Detail



4.19 Five-panel interior door.

Building: 228 (NCO Type B)

1. Basic Building Data

Building No.: 228

Historical Use: NCO Family Housing

Date Constructed: 1931

Current Use: NCO Family Housing

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type B Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Porch attic vent screens missing
 - * Crawl space access door deteriorating
 - * Concrete re-bar exposed and rusting, right side rear
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building: 229 (NCO Type B)

Building No.: 229

Date Constructed: 1930 (December)

Area: 956 sf

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings

 Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.

* Front porch roof tile missing, right side

6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building No.: 236 Historical Use: NCO Family Housing Current Use: NCO Family Housing

Building: 236 (NCO Type B)

Date Constructed: 1931

Area: 956 sf

2. Historical and Architectural Significance: See general form for NCO Type B Buildings

3. Building Description/Condition: See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings. The pipe at the right side of the porch is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Remove exterior wire on porch
 - * Paint overspray on roof tiles, left side
 - * Cracked and displaced concrete dams at crawl space vent openings
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building No.: 237 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Building: 237 (NCO Type B)

Building: 237 (NCO Type B)

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

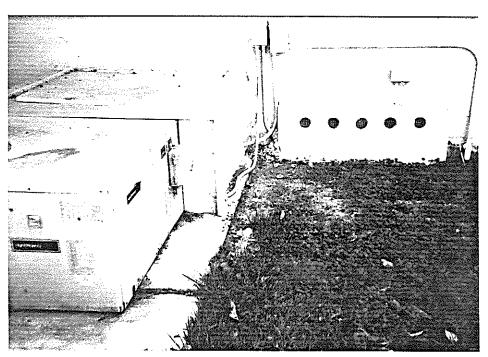
3. Building Description/Condition:

See general form for NCO Type B Buildings

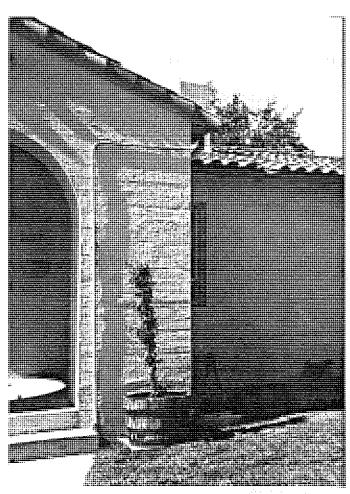
4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type B Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Paint overspray on roof tile
 - * Water heater flue falling off
 - * Crawl space access door deteriorating
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Selected Photograph of Building Detail



4.20 Non-contributing exterior HV/AC units and concrete covers over foundation vents.



4.21 The exterior conduit pierces the eaves rather than the gable end vent, a better (but not perfect) solution.

Building No.: 244 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Building: 244 (NCO Type B)

Building: 244 (NCO Type B)

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

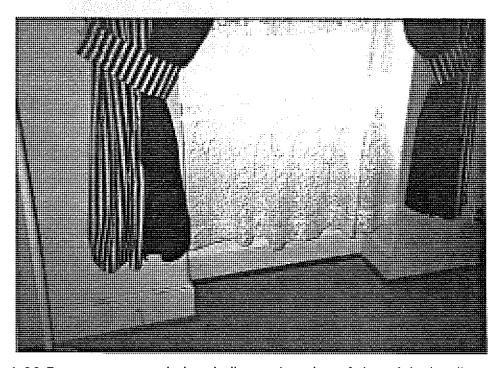
3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type B Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Roof tile missing
 - * Crawl space access door deteriorating
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Selected Photograph of Building Detail



4.22 Deep recess at window indicates location of the original radiator.

Historical Use: NCO Family Housing

Building: 245 (NCO Type B)

Current Use: NCO Family Housing

Building No.: 245

Date Constructed: 1930 (December)

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

- 4. Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type B Buildings
- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * End gutter/downspout missing right side
 - * Roof tile cracked and missing
 - * Leak in ground on left side of building
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building No.: 329

Date Constructed: 1931

Area: 956 sf

Building: 329 (NCO Type B)

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Building: 329 (NCO Type B)

2. Historical and Architectural Significance: See general form for NCO Type B Buildings

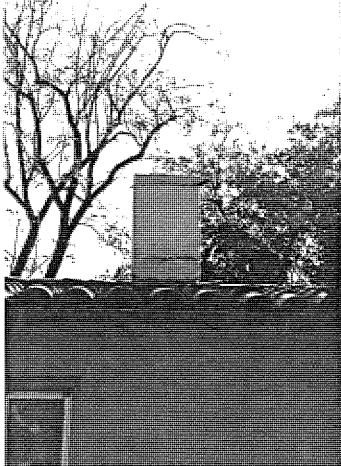
3. Building Description/Condition: See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings. The television antenna strap on the chimney is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Broken vent tile, porch and right side
 - * Broken roof tile, porch
 - * Broken and displaced roof tile, rear
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Selected Photograph of Building Detail

4.23 Antenna straps on the chimney, a common intrusion, especially in the NCO area.



Building No.: 334 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Building: 334 (NCO Type B)

Area: 956 sf

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

- 4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings
- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Rusted porch rails and spalling concrete
 - * Wood trim on crawl space access door deteriorating
 - * Crack in wall on right side
 - * Roof tile broken, rear and front
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building: 335 (NCO Type B)

Building No.: 335

Date Constructed: 1931

Area: 956 sf

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

- 3. Building Description/Condition:

 See general form for NCO Type B Buildings
- 4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings
- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * HV/AC unit ducting dented
 - * Right side rafter tail falling off
 - * Front porch attic vent screen torn
- 6. Possible Restoration/Enhancement Measures:
 See general form for NCO Type B Buildings.

Building No.: 339 Historical Use: NCO Family Housing
Date Constructed: 1931 Current Use: NCO Family Housing

Building: 339 (NCO Type B)

Area: 956 sf

2. Historical and Architectural Significance: See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type B Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Roof tile loose in front
 - * Paint overspray on roof tile
 - * Replace crawl space access door, trim
 - * Attic vent screens are missing
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

Building: 343 (NCO Type B)

Building No.: 343

Date Constructed: 1931

Area: 956 sf

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type B Buildings

3. Building Description/Condition:

See general form for NCO Type B Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type B Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type B Buildings.
 - * Loose roof tile
 - * Paint overspray on roof tile
 - * Grout missing around gable end vent
 - * HV/AC unit cover missing
 - * Attic vent screens need repair
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type B Buildings.

NCO Building Type C

Historical Use: NCO Family Housing Current Use: NCO Family Housing

Date Constructed: 1930-4 Area: 950 sq. ft.

2. Historical and Architectural Significance

The NCO Type C house is one of the original building types built during the initial years of construction at March AFB. There are 39 NCO Type C residences within the historic district. All are built of the hollow wall concrete method that is a major part of the significance of this historic district. All are in the Mission Revival style that defines the character of the historic district.

3. Building Description/Condition

Description: The NCO Type C house is a 950 sf single story residence. It is a standard type for March AFB, also designated by subtypes C-1 and C-2. The Type C building is a one-story hollow-wall concrete residence with a Mission tile gabled roof. It features a front-facing gable with a parallel gabled porch roof to one side and a shedroofed extension to the other. In Type C-1, the porch is to the left and the shed roofed extension to the right (Building C-2 is the reverse). The porch features arched openings to either side with a rectangular opening facing the street. It includes a linear plan on the elevation facing the courtyard, with a concrete chimney about half way along this elevation. Four tall casement windows are also found along this elevation. The other side elevation includes the shed-roofed extension. Two casement windows are found on this elevation, with bands of smaller casement windows on the extension. As with the NCO Type A and B models, the Type C residences completed before April 1930 (Buildings 200, 201, 204, 205, 208, 209, 212, 213, 216, 217, 220, and 221) originally had wood sash. Those built later possessed steel casements with transoms. (Photographs 4.24 through 4.28) This building type features a triangular vent pattern at the facade.

The NCO Type C building retains many important interior and exterior features. Among its important exterior features are the original rough form board concrete surface, the tile roof, its original front door, and its sturdy and decorative copper gutter and downspout system. The interior includes many pleasant and functional original features, including its original fireplace and mantle, built in book shelves and sideboard, as well as a small telephone niche in the hallway. There are few major intrusions upon its historical integrity, the most notable being replacement of all original steel sash with aluminum casements, the installation of dropped acoustical tile ceilings in the bath and kitchen, and non-historic floor coverings (carpeting or parquet) over the original oak planking.

General Condition: See the NCO housing summary for general condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * Concrete chimney * Round clay attic vents in gable ends * Vertical grooved wood front door¹ * One-light, two-panel rear door, or four-light, two-panel on a few * Copper gutters and downspouts * Concrete splash guard * Steel porch railing * Scalloped rafter tails * Courtyard walls * Radiator vents at eaves	* Brick fireplace * Wood mantle * Built-in shelves by fireplace * Built-in sideboard, dinning room * Built-in telephone niche * Plaster ceilings, except kitchen and bath * Five panel interior doors * Picture moulding, door and base trim

Non-Contributing Elements

Exterior	Interior
* Aluminum frame replacement casement windows * Concrete cover over crawl space vents * Electrical conduit in gable end vent * Exterior HV/AC unit and water heater * Television antenna mounting straps on chimney	* Dropped acoustic tile ceilings in kitchen and bath * Intrusion of kitchen countertop into kitchen window opening * Kitchen cabinets * Kitchen appliances and fixtures * Non-historic floor covering * Paint on brick fireplace (some fireplaces not painted) * HV/AC floor grills, radiators removed

5. Maintenance Considerations

See individual building forms. The porch railings are especially rusted on most NCO Type C houses.

¹ Note that the front door glazed panel has vertical proportions in houses at the south end of Gilley Street, and more square proportions in other houses.

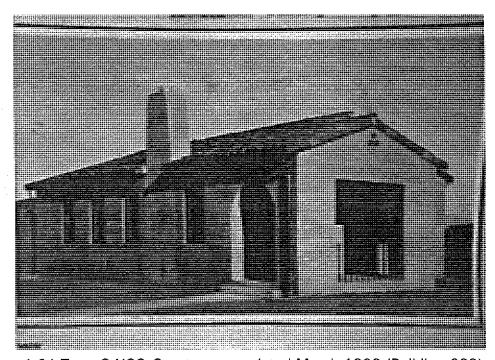
6. Possible Restoration/Enhancement Measures

As discussed earlier, the historical integrity is generally very high for the NCO C buildings, indicating that little restoration work is needed or possible. Restoration can occur most cost-effectively when non-historical elements need to be replaced. In the NCO C type buildings, four non-historic items will be scheduled for replacement in coming years and decades: flooring in living areas (carpets or parquet); aluminum windows; acoustical tiles in kitchen and bath; and formica kitchen counters. As these items are replaced, every effort should be made to replicate or approximate the original design. For example, the formica kitchen counters currently intrude into the kitchen window opening, an intrusion that is visible from the exterior and which block natural lighting. At no or little extra cost, the replacement could be customized to respect the full window opening.

Priority restoration undertakings, linked to maintenance activities:

- 1. Replace formica kitchen counters, respecting kitchen window openings.
- 2. Return kitchen and bath ceiling to full height as acoustical tile ceilings deteriorate.
- 3. As windows are scheduled for replacement, replace aluminum sash with wood or steel casements.
- 4. Restoration of hardwood floors as carpeting or parquet flooring deteriorate.

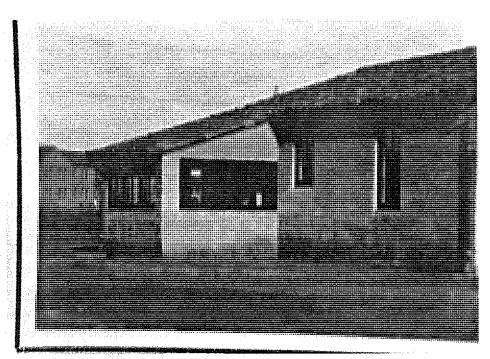
Selected Photographs of Building Detail



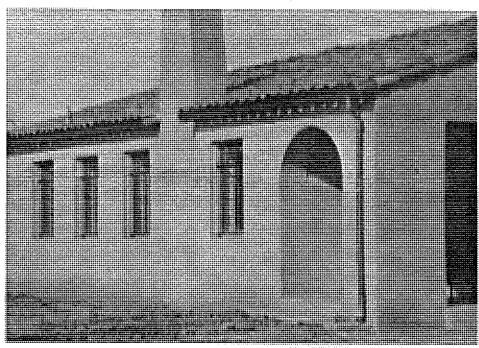
4.24 Type C NCO Quarters, completed March 1930 (Building 200)



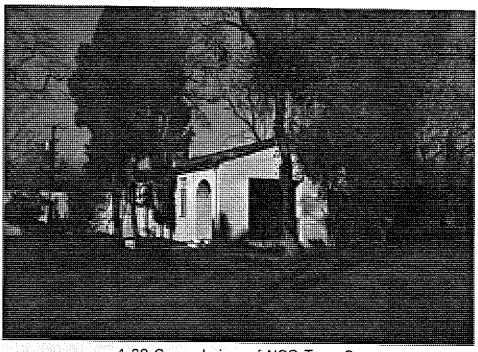
4.25 Type C NCO Quarters, completed March 1930 (Building 201)



4.26 Type C NCO Quarters, completed March 1930, sunroom (Building 220)



4.27 Type C NCO Quarters, completed 1931 (Building 222).



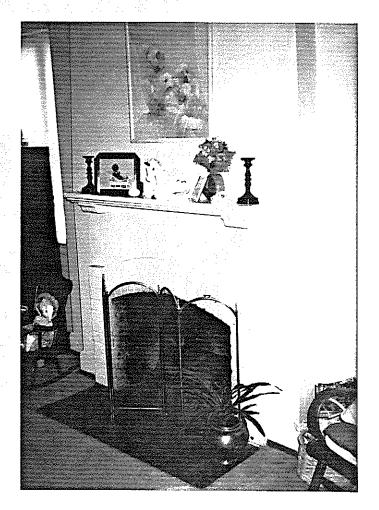
4.28 General view of NCO Type C.

Selected Photographs of Building Detail

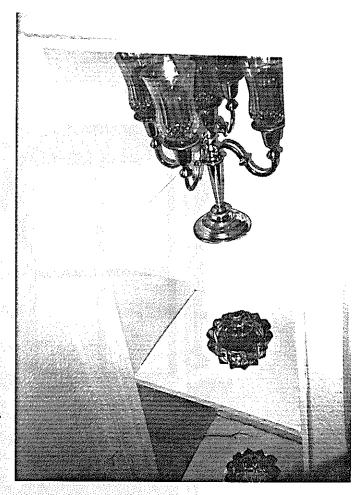
NCO Building Type C



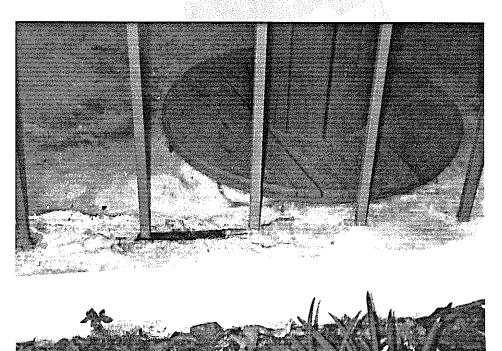
4.29 Fireplace and mantle, unpainted, NCO Type C.



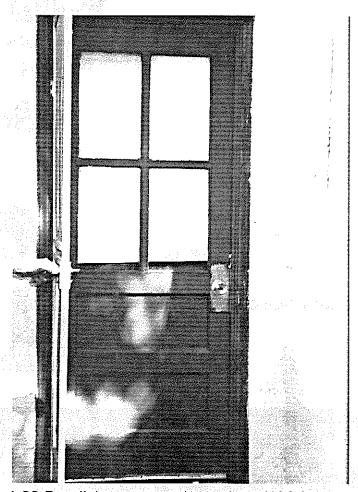
4.30 Fireplace, painted, NCO Type C.



4.31 Built-in bookcase, NCO Type C.



4.32 Typical rusted railing and spalling concrete on front porch, NCO Type C.



4.33 Four-light, two-panel rear door, NCO Type C.

Building: 200 (NCO Type C)

Building No.: 200 Historical Use: NCO Family Housing
Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The television antenna strap on the chimney is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Cracks in right side wall
 - * Broken window in sunroom
 - * Vent screens missing
 - * Roof tile missing at chimney
 - * Broken roof tile
 - * Paint overspray on roof tile
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 201 (NCO Type C)

Building No.: 201

Date Constructed: 1930 (March)

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO-Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The television antenna is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * HV/AC duct cover loose
 - * Crack in wall, sunroom window
 - * Stain on rear wall near arch
- 6. Possible Restoration/Enhancement Measures:
 See general form for NCO Type C Buildings.

Building: 204 (NCO Type C)

Building No.: 204

Date Constructed: 1930 (March)

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

current ose. Noo Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The rounded wall caps, which were called for in plans but rarely done, are a contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Sunroom gutter is bent
 - * Broken and displaced roof tile
 - * Vents screen torn
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 205 (NCO Type C)

Building No.: 205

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings. The four-light, two-panel laundry door is a contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Damaged downspout end at front porch
 - * Vent screens missing
 - * Roof tile missing at chimney
 - * Heavy layer of pine needles on roof
 - * Tree growing close to right wall
 - * Retaining wall at rear foundation does not cover all vent openings
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 208 Historical Use: NCO Family Housing

Building: 208 (NCO Type C)

Building No.: 208 Historical Use: NCO Family Housing
Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The four-light, two-panel laundry door is a contributing element. The television is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Displaced roof tile
 - * Paint overspray on roof tiles
 - * Cracks in right wall
 - * Vent screens torn
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 209 (NCO Type C)

Building No.: 209

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Roof tile missing
 - * Window putty damaged
 - * Vent screens missing
 - * Foundation vents at ground level or below
 - * Re-bar exposed, spalling concrete, rear courtyard wall
 - * Roof tile loose at porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 212 Historical Use: NCO Family Housing

Building: 212 (NCO Type C)

Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings. The unusual four-light, three-panel rear door is a contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted rails at front porch
 - * Vent screens damaged
 - * Broken and displaced roof tile
 - * Dented sunroom gutter
 - * Window glazing putty needs repair
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 213 (NCO Type C)

Building No.: 213

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails
 - * Vent screens missing
 - * Crack in laundry wall
 - * Concrete spalling, rear wall of sunroom
 - * Displaced roof tile
 - * HV/AC duct cover dented
 - * Roof tile missing, front porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 216 Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Building: 216 (NCO Type C)

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

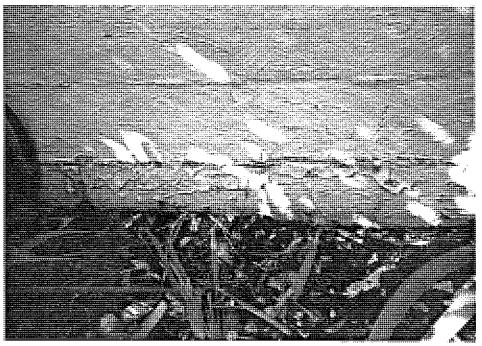
3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings. The four-light, two-panel laundry door is a contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Paint damaged on all walls

 - * Paint overspray on roof tile
 * Re-bar exposed in right wall
 - * Some window putty needs repair
 - * Potential leak where gutter meets sunroom roof tile (front side wall)
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Selected Photograph of Building Detail



4.34 Paint peeling at foundation. This condition, while not common, was observed throughout the NCO area.

Building: 217 (NCO Type C)

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Building No.: 217

Date Constructed: 1930 (March)

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The small wooden bracket at the front porch, possible part of the television antenna, is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Right side gutter dented
 - * Crack in sunroom wall
 - * Sunroom gutter torn/patched inside
 - * Window putty damaged
 - * Rear door light damaged
 - * Roof rake tile missing above laundry scupper
 - * Crack in wall at laundry scupper
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures:

See general form for NCO Type C Buildings.

Building: 220 (NCO Type C)

Building No.: 220

Historical Use: NCO Family Housing Date Constructed: 1930 (March) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Clogged gutter downspouts
 - * Window putty needs repair
 - * Sunroom walls cracking
 - * Vent screens damaged
 - * Front porch downspout missing bottom piece
 - * Roof tile displaced and broken
 - * Paint peeling and rusting at water heater enclosure
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 221 (NCO Type C)

Building No.: 221

Date Constructed: 1930 (March)

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The backflow preventer at the front porch is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Vent screens missing
 - * Crack in front wall at porch
 - * Porch railing missing pieces
 - * Crack in right rear wall
 - * Paint overspray on roof tile
 - * Sunroom gutter is bent
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 222

Date Constructed: 1931

Area: 950 sq. ft.

Building: 222 (NCO Type C)

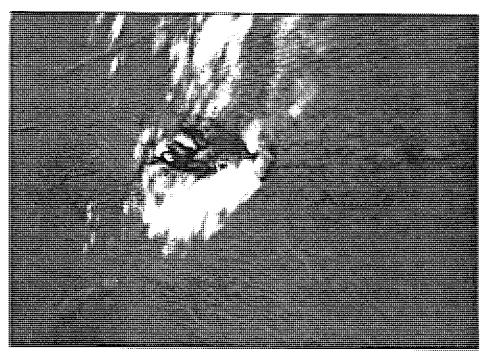
Historical Use: NCO Family Housing

Current Use: NCO Family Housing

- Historical and Architectural Significance:
 See general form for NCO Type C Buildings
- 3. Building Description/Condition:

 See general form for NCO Type C Buildings
- 4. Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings
- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Re-bar exposed at upper chimney
 - * Roof tile missing at chimney eave
 - * Window latches are sprung
 - * Significant hole at the right rear of side wall
 - * Rear crawl space door screen torn
 - * Hole in concrete wall below laundry window
 - * Chip in concrete wall, rear corner of sunroom
 - * Left side gutter is dented.
 - * Hole in concrete left of porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Selected Photograph of Building Detail



4.35 Hole in concrete wall, right rear.

Building: 223 (NCO Type C)

Building No.: 223

Date Constructed: 1931

Area: 950 sq. ft.

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Porch attic vent screens missing
 - * Putty peeling on rear window frames
 - * Rear door mouldings damaged
 - * Roof tile missing at left side vent
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 226 (NCO Type C)

Building No.: 226 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings. The television antenna is a noncontributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Vent tile broken and screen missing above porch
 - * Cap missing on exterior plumbing vent, kitchen
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 227 (NCO Type C)

Building No.: 227

Date Constructed: 1930 (December)

Area: 950 sq. ft.

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The porch downspout replacement and the backflow preventer at the porch are non-contributing elements.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof tile missing at chimney
 - * Sunroom downspout detached
 - * Exposed re-bar near laundry room and right side wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 230 Historical Use: NCO Family Housing

Building: 230 (NCO Type C)

Date Constructed: 1931 Current Use: NCO Family Housing Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The sun porch gutter and downspout replacement are non-contributing elements.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Re-bar exposed on porch pillar
 - * Concrete spalling, right side wall
 - * Laundry roof leak, patches exposed
 - * Rear attic vent screen missing
 - * Crawl space access door deteriorating
 - * Rusting electrical box at right wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 231 (NCO Type C)

Building No.: 231

Date Constructed: 1930 (December)

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The concrete landing added at the rear door is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rear window putty displaced
 - * Leaking irrigation head at intersection of front walk and porch
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 234 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Area: 950 sq. ft.

Historical and Architectural Significance:
 See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The aluminum screen entry door, the replacement entry door, and the roof tiles placed on top of the laundry parapet walls are non-contributing elements.

Building: 234 (NCO Type C)

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Re-bar exposed and rusting at right rear corner
 - * Rear vent screens missing
 - * Crack in exterior wall, left side
 - * Roof tiles missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 235 (NCO Type C)

Building No.: 235 Historical Use: NCO Family Housing Date Constructed: 1930 (December) Current Use: NCO Family Housing

Area: 950 sq. ft.

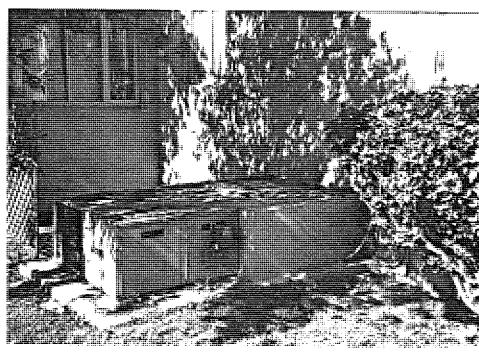
2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Front porch light fixture falling off
 - * Roof tile at chimney missing
 - * Kitchen sink vent plug missing
 - * Front porch attic vent screen missing
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Selected Photograph of Building Detail



4.36 Typical HV/AC unit on concrete slab.

Building No.: 238 Historical Use: NCO Family Housing

Building: 238 (NCO Type C)

Date Constructed: 1931 Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The television antenna is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Gap between front porch concrete floor slab and front wall
 - * Roof tile missing at chimney
 - * Re-bar exposed, wall near archway
 - * Rear crawl space access door deteriorating
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 239 (NCO Type C)

Building No.: 239

Date Constructed: 1930 (December)

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type C Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Paint overspray on roof tiles
 - * Splash blocks and downspouts incorrectly placed
 - * Paint peeling, wall near laundry
 - * Crack in wall near kitchen window
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 242 (NCO Type C)

1. Basic Building Data

Building No.: 242

Date Constructed: 1931

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

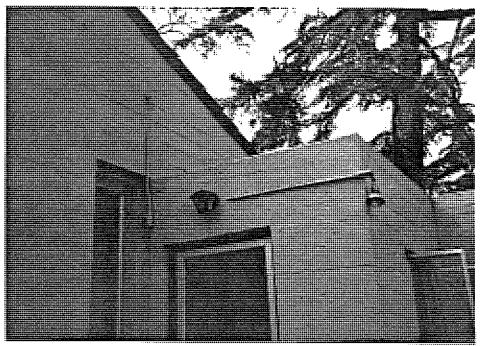
3. Building Description/Condition:

See general form for NCO Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The attic vent screen added to the front are non-contributing elements.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rear left downspout has fallen off
 - * Front porch roof tile missing
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Selected Photograph of Building Detail



4.37 The exterior conduits at the back door are common to many NCO houses.

Building No.: 243 Historical Use: NCO Family Housing

Building: 243 (NCO Type C)

Date Constructed: 1930 (December) Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The television antenna and the downspout cap at the right side are non-contributing elements.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Crack in concrete wall
 - * Rear rake roof tile missing
 - * Sunroom roof tile missing
 - * Re-Bar exposed left porch pillar
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 246

Building: 246 (NCO Type C)

Building No.: 246 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The replacement splash block is a non-contributing element.

5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.

* Broken vent tile, front porch

6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 247

Date Constructed: 1931

Area: 950 sq. ft.

Building: 247 (NCO Type C)

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof vent cap missing
 - * Roof tile displaced
 - * Attic vent screens torn
 - * Nearly flattened left downspout
 - * Re-bar exposed, left wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 250 Historical Use: NCO Family Housing
Date Constructed: 1931 Current Use: NCO Family Housing

Building: 250 (NCO Type C)

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

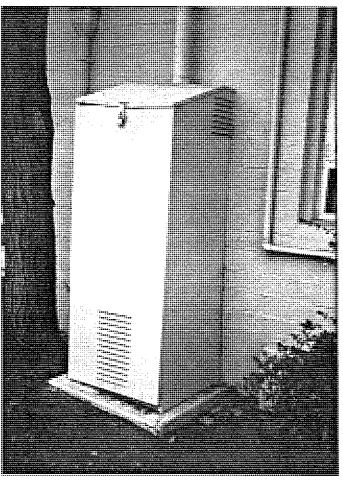
3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Laundry roof leak
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Selected Photograph of Building Detail



4.38 Typical water heater enclosure.

Building: 251 (NCO Type C)

Historical Use: NCO Family Housing Building No.: 251 Current Use: NCO Family Housing Date Constructed: 1931

Area: 950 sq. ft.

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings. The television antenna mounting strap on the chimney is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof tile displaced at chimney
 - * Downspout detached, right wall
 - * Concrete wall chipped, rear wall
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 328

Date Constructed: 1931

Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings. This building is one of the few NCO Type C houses that is not connected to courtyard curtain walls.

Building: 328 (NCO Type C)

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof tile missing at chimney
 - * Front vent screens torn
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 330 (NCO Type C)

Building No.: 330

Date Constructed: 1931

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The replacement downspout at the porch is a non-contributing element.

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Attic vent screens torn, front and rear
 - * Roof tiles missing at chimney
 - * Significant crack in right rear wall
 - * Palm trees pushing against two house corners
 - * Sunroom gutter dented
 - * Roof tiles broken
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 333 Historical Use: NCO Family Housing

Building: 333 (NCO Type C)

Date Constructed: 1931 Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:
See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Front attic vent screens torn
 - * Backflow preventer leaking
 - * Crawl space access door deteriorating
 - * Drill holes in left wall, rear
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 336 (NCO Type C)

Building No.: 336

Date Constructed: 1931

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Rusted porch rails and spalling concrete
 - * Rafter tail broken, front porch
 - * Attic vent screen missing
 - * Bowed window
 - * Roof tile missing at chimney
 - * Laundry roof leak
 - * Sunroom roof tile broken
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 338 (NCO Type C)

Building No.: 338

Date Constructed: 1931

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings. The roof tile placed on the laundry parapet walls is a non-contributing element.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Paint overspray on roof tiles
 - * Sunroom roof tiles displaced
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 340 Historical Use: NCO Family Housing

Building: 340 (NCO Type C)

Date Constructed: 1931 Historical Use: NCO Family Housing

Current Use: NCO Family Housing

Area: 950 sq. ft.

2. Historical and Architectural Significance:

See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements:

See general form for NCO Type C Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof tile missing, chimney and porch
 - * Right rear downspout has fallen off
 - * Horizontal crack top of right rear wall, re-bar exposed, continues across laundry parapet wall
 - * Paint overspray on roof tiles
 - * Spalling concrete, rear wall
 - * Roof tiles displaced, rear
 - * Rear gutter dented
 - * Large splits in porch beam
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 342 Historical Use: NCO Family Housing Date Constructed: 1931 Current Use: NCO Family Housing

Building: 342 (NCO Type C)

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Attic vent screens missing
 - * Paint overspray on roof tile
 - * Roof tile missing, displaced
 - * Crack in laundry wall
 - * Porch downspout loose
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 344 (NCO Type C)

Building No.: 344

Date Constructed: 1931

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance: See general form for NCO Type C Buildings

3. Building Description/Condition: See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Paint overspray on roof tile
 - * Chipped concrete, porch pillar
 - * Spalling concrete, right wall
 - * Roof tile missing at chimney
 - * Crack in wall at kitchen window
 - * HV/AC duct cover dented
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building No.: 346 Historical Use: NCO Family Housing
Date Constructed: 1931 Current Use: NCO Family Housing

Building: 346 (NCO Type C)

Area: 950 sq. ft.

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

Inventory of Contributing and Non-Contributing Elements:
 See general form for NCO Type C Buildings. The wood members added to the front porch rail are non-contributing elements.

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Attic vent screens missing
 - * Roof tile broken and displaced
 - * Sunroom gutter deformed
 - * Crack in rear wall
 - * Leak in laundry roof
 - * Bent scupper, left wall near laundry
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 381 (NCO Type C)

Building No.: 381

Date Constructed: 1934

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Porch light coming apart
 - * Attic vent screens torn
 - * Roof tile missing at chimney
 - * Right side gutter is dented
 - * Laundry dryer vent broken off
 - * Roof rake tile missing or broken, front
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.

Building: 383 (NCO Type C)

Building No.: 383

Date Constructed: 1934

Area: 950 sq. ft.

Historical Use: NCO Family Housing Current Use: NCO Family Housing

2. Historical and Architectural Significance:
See general form for NCO Type C Buildings

3. Building Description/Condition:

See general form for NCO Type C Buildings

4. Inventory of Contributing and Non-Contributing Elements: See general form for NCO Type C Buildings

- 5. Maintenance Considerations: Unique to this building. See general form for NCO Type C Buildings.
 - * Roof tile broken, sunroom
 - * Rear splash block displaced
 - * Roof tile missing at chimney
- 6. Possible Restoration/Enhancement Measures: See general form for NCO Type C Buildings.



5. Garages within NCO and Officers Quarters Sector

Buildings Treated in This Section (by Building Number):

112, 113, 116, 165, 175, 177, 178, 179, 180, 252, 253, 254, 255, 256, 257, 331, 362, 364

5.1. General comments on integrity, maintenance, and restorative measures for garages within NCO and Officers Quarters sector

The March Field Historic District includes nineteen garage structures, sited throughout the housing area, and originally accommodating from six to twelve automobiles. Construction began in 1929, but in 1932, the garages in the officer compound were modified to include storage units, some by converting garage spaces into a pair of storage units, but most by adding storage space at the rear or sides of existing garages. While these simple, shed-roofed buildings are undistinguished, they were built as an integral part of the initial construction and retain their own integrity. Eighteen of the garages are original; the nineteenth, opposite NCO Quarters 233, is a very recent 7-unit garage building which mimics the geometry (but not the construction) of the originals, with the exception of the rear windows--which are about twice the area of the original.

5.2 Description and Condition of Garages

The side, rear and partition walls of each garage are constructed of hollow clay tile. The original, gently rearward sloping roofing was described as "steel deck with built up roofing." The original corrugated decking remains, now covered with plywood, which in turn is covered with built-up roofing. Facia boards, usually 1 x 4 but rarely 1 x 6, trim the top of the walls, with metal flashing dropping over. Originally, the entire front of the buildings were composed of large, side hinged double wooden plank doors with wooden diagonal bracing forming a pair of stacked double triangles (Photographs 5.1 & 5.2). These doors have been replaced with stuccoed wood frame walls within which there are standard metal storage room doors and standard sized, segmental metal roll-up-type doors. In the fairly recent past, the original windows have been replaced by tinted glass awning windows in bronze anodized frames.

Generally, the garages appear to be in fair structural condition. The four major maintenance issues discussed below all have serious implications for the structural integrity of these buildings.

With respect to maintenance of the garages, March AFB has recently resolved one major problem, that being leaky roofs. Four additional maintenance concerns were identified during the field visit, as discussed below under "Maintenance Considerations."

Restoration potential is limited for these small, utilitarian buildings. It would be possible to restore the original wooden facades and doors as well as the original lighting fixtures. This restoration work should be considered carefully, however, in comparison to restoration needs and historic preservation values elsewhere in the historic district.

5.3 Contributing Elements at Garages

All the Garage structures are contributors to the Historic District, except the new building which was rebuilt to match, in visual quality, the garage which had been earlier destroyed.

Exterior:

Rough textured plaster on sides and rear.

Hollow clay tile construction.

Low, wood trimmed shed roofs.

Small window openings on the rear facades.

Interior:

Unpainted hollow clay tile walls.

Wood roof purlins.
Steel roof decking.

5.4 Non-contributing Elements at Garages

Exterior: Although the uniformity of the change from the original doors prevents them from detracting from or degrading the district, the later doors and the smooth plaster walls surrounding them do not contribute.

Likewise, the simplicity and color of the dark anodized aluminum replacement windows and the utilitarian lighting fixtures minimize their visual impact on the historic district.

Interior: Lighting fixtures.

5.5 Maintenance Considerations for Garages

Four recurring problems are evident:

The connection of the "new" plastered wood stud front walls to the original hollow clay tile wall needs attention. The front corners of the garages all display an offset where the plastered wood stud wall extends just a little beyond the original side walls. This connection is frequently poorly finished and poorly flashed, both at the bottom and at the roof. There is evidence of water infiltration and of deteriorating wood within the wall. All these corners should be examined and should be made weathertight by means of repair of wood, caulking, flashing and plaster.

The close proximity of shallow-rooted trees to several garages is causing the walls to be lifted by the root system. To prevent worsening uplift and wall cracking, corrective measures must be undertaken. Given that these are utilitarian buildings, and given the great value of the rows of trees, it would not be inappropriate to consider undercutting the wall and forming a concrete bridge over the offending roots. This bridge would be in the plane of the garage wall and should provide for continued root growth. Asphalt, rather than concrete, paving patches at the trouble spots will be able to absorb movement with greater ease.

There is a lack of uniformity as to rainwater removal from the rear of the buildings. Where the rear wall is level, a modest and uniform rainwater runoff, over the gravel stop, along the length of the wall, should pose no problems. In those situations where rainwater collects in one or more locations along the rear wall, the flashing should be repaired for uniform runoff, or a gutter or scupper should be installed, along with a downspout and diverter. Unfortunately, the only way to discover the problems is to inspect the buildings during rainfall.

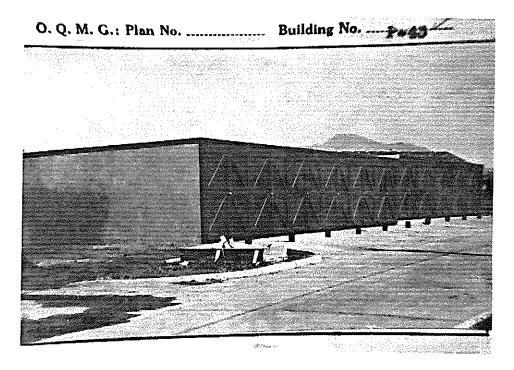
The wood facia and flashing at the roof are in need of periodic review and, where appropriate, repair. Although these items are usually in good shape, in some locations missing facia sections and discontinuous flashing occur. This situation is particularly common at those wall intersections noted in item 1 above, and this is where the greatest potential for water infiltration and dryrot occurs.

5.6 Potential Restoration Projects at Garages

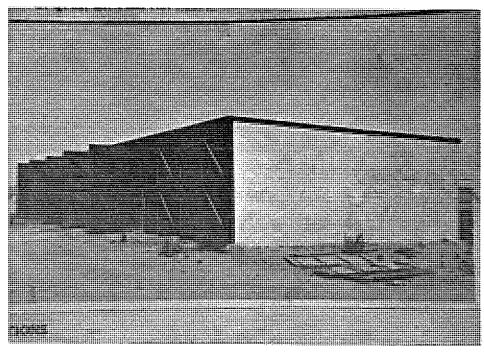
Recognizing that it would be costly both initially and in terms of maintenance, the replacement of the existing doors with wood to match the original is not anticipated - although it would be most appropriate. When the lighting fixtures have lived out their useful lives, replacement fixtures of perhaps a more timeless appearance would be appropriate. Err on the side of simplicity.

Selected Photographs of Building Detail

Garages



5.1 Eleven car garage, as constructed in 1932 (Building 331).



5.2 Typical twelve car garage, 1929.

Building No.: 112 Historical Use: 6-Car Garage, Officer Housing Date Constructed: 1929 Current Use: 4-Car Garage/Storage, Officer Housing

Area: 1293 sq. ft.

2. Historical and Architectural Significance See Garage General Comments 5.1.

3. Building Description/Condition

Description: Building 112 was a six-unit automobile garage, one of five such units in the officers quarters residential sector. It has since been converted into four garages and four storage units.

Building: 112

General Condition: The entire building, including plaster, trim and flashings appear to be in good condition.

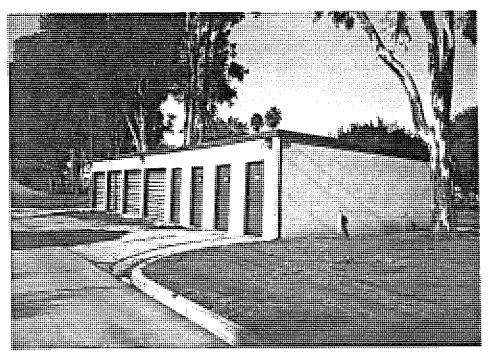
See Garage General Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements See Garage General Comments 5.3, 5.4
- 5. Maintenance Considerations

No noticeable problems. See Garage General Comments 5.5

6. Possible Restoration/Enhancement Measures See Garage General Comments 5.6

Selected Photograph of Building Detail



5.3 Six car garage converted into garage/storage building.

Building No.: 113

Date Constructed: 1939

Area: 1950 sq. ft.

Historical Use: 6-Car Garage, Officer Housing

Building: 113

Current Use: 6-Car Garage/Storage, Officer Housing

2. Historical and Architectural Significance See Garage General Comments 5.1

3. Building Description/Condition

Description: Building 113 is a six-unit automobile garage, one of five such units in the officers quarters residential sector. An early, but subsequent, addition added tree storage units on each side.

General Condition: Most noteworthy is a severe crack at the rear of the east wall caused by the rising root system of the adjacent eucalyptus tree. There is clear evidence of numerous patches to the same crack over time. At this point, the wall displacement is causing collateral damage to the rear wall, where the window and adjoining walls have moved considerably out of plumb. The out-of-plumb condition poses a potential partial collapse situation which needs to be addressed. A section of roof facia is also missing from the rear wall.

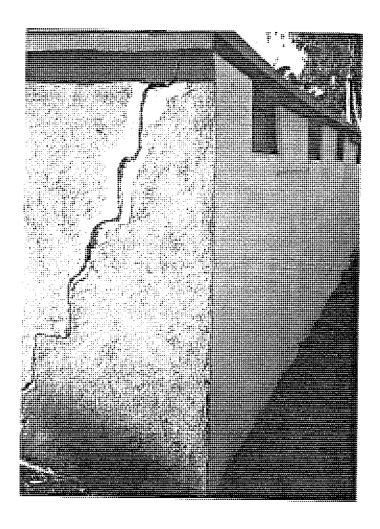
See also General Garage Comments 5.2.

4. Inventory of Contributing and Non-Contributing Elements See Garage General Comments, 5.3, 5.4

5. Maintenance Considerations

Repair of the northeast corner will be required, as will replacement of the facia trim at the rear. See Garage General Comments 5.5 for suggested method of repair.

6. Possible Restoration/Enhancement Measures See Garage General Comments 5.6



5.4 Crack in east wall (Building 113).

Building No.: 116 Historical Use: 6-Car Garage, Officer Housing Date Constructed: 1929 Current Use: 6-Car Garage/Storage, Officer Housing

Area: 1950 sq. ft.

2. Historical and Architectural Significance See Garage General Comments 5.1.

3. Building Description/Condition

Description: Building 116 is a six-unit automobile garage, one of five such units in the officers quarters residential sector. An early but subsequent addition (1932) added three storage units on each side.

Building: 116

General Condition: The entire building, including plaster, trim and flashings appear to be in good condition.

See Garage General Comments 5.2.

- 4. Inventory of Contributing and Non-Contributing Elements See Garage General Comments 5.3, 5.4.
- 5. Maintenance Considerations

No noticeable problems.

See Garage General Comments 5.5.

6. Possible Restoration/Enhancement Measures
See Garage General Comments 5.6.

Building No.: 165 Historical Use: 12-Car Garage, Officer Housing Date Constructed: 1929 Current Use: 12-Car Garage/Storage, Officer Housing

Area: 4,006 sq. ft.

2. Historical and Architectural Significance See General Garage Comments 5.1

3. Building Description/Condition

Description: Building 165 is a 4150 sf twelve-unit automobile garage, one of two such units in the officers quarters residential sector. Behind and connected to each garage is a storage facility about half the garage size. Old joints in the exterior side walls indicate that these storage units were an early addition, but are not original. Quartermaster documents indicate they were added in 1932. Noteworthy here is a 10" change in elevation at the midpoint of the building, to accommodate the grade change.

Building: 165

General Condition: The building is in generally good condition. This building includes a rain gutter at the rear, which is somewhat unusual for the garages. The downspout has been crushed, however, and there is no rain diverter.

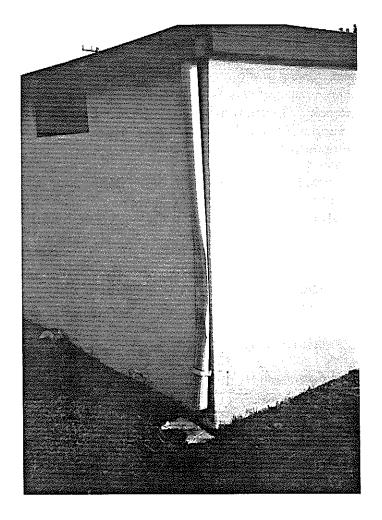
See General Garage Comments 5.2.

- 4. Inventory of Contributing and Non-Contributing Elements See General Garage Comments 5.3, 5.4.
- Maintenance Considerations

Insure that the flashings, gutters, downspouts and diverters are complete and in working order.

See General Garage Comments 5.5.

6. Possible Restoration/Enhancement Measures
See General Garage Comments 5.6



5.5 Crushed downspout, lacking rain diverter (Building 165).

Building No.: 175 Date Constructed: 1929

Area: 4,150 sq. ft.

Historical Use: 12-Car Garage, Officer Housing

Building: 175

Current Use: 12-Car Garage/Storage, Officer Housing

2. Historical and Architectural Significance See General Garage Comments 5.1

3. Building Description/Condition

Description: Building 175 is a 4150 sf twelve-unit automobile garage, one of two such units in the officers quarters residential sector. Constructed in 1929 as a six-unit garage, its capacity was doubled in 1931. Behind and connected to each garage is a storage facility about half the garage size. Old joints in the exterior side walls show that these storage units were an early addition, added in 1932, according to the Quartermaster documents.

General Condition: Generally good. At the rear, near the roof, is evidence of damaged wood trim, significant deterioration, and a missing downspout, although no gutters are presently in evidence.

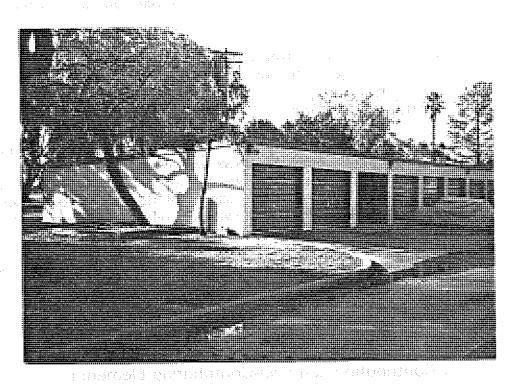
See General Garage Comments 5.2.

- 4. Inventory of Contributing and Non-Contributing Elements See General Garage Comments 5.3, 5.4.
- 5. Maintenance Considerations

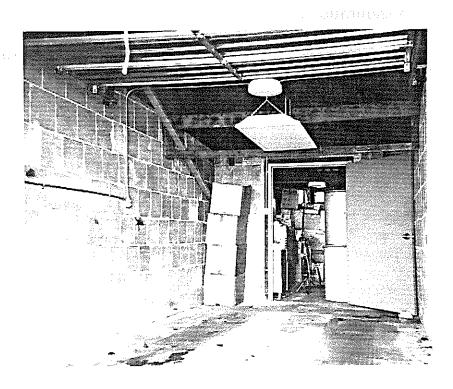
Insure that the flashings are complete, secure and deep enough to protect the wood and the wood-plaster joint from deteriorating.

See General Garage Comments 5.5.

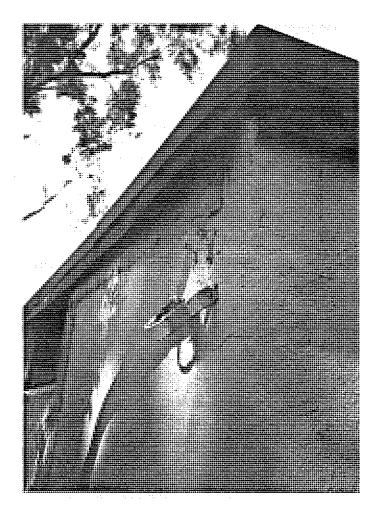
6. Possible Restoration/Enhancement Measures See General Garage Comments 5.6



5.6 General view of garage, Building 175.



5.7 Interior of garage, showing storage room in rear (Building 175).



5.8 Damaged trim and missing downspout (Building 175).

Building No.: 177

Date Constructed: 1932

Area: 737 sq. ft.

Historical Use: Garage, Commanding Officer

Building: 177

Current Use: Garage, Commanding Officer

2. Historical and Architectural Significance

Building 177 is a two-car garage with a storage room at the rear. It adjoins the commanding officer's residence (Building 176), and was designed for his use. In the very earliest years of the base, it was a temporary fire house, reverting to use by the commanding officer when Building 301 was completed.

3. Building Description/Condition

Description: Building 176 is constructed of 8" thick board-formed concrete, with a Mission-tiled gable roof. A wooden partition with original "bead-board" panelling separates the parking area from a storage room at the rear. There were originally a pair of single garage doors at the front, but the center support was removed and a two-car garage door installed sometime after WWII. Otherwise it is almost completely unmodified, including "vigas" at the walls, and contributes to the significance of this historic district.

General Condition: The building is in very good physical condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof* Board-formed concrete walls* "Vigas" at roof* Original windows	* "Bead-board" panelled partition

Non-Contributing Elements

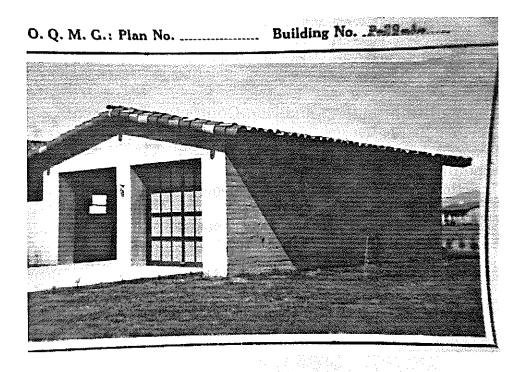
Exterior	Interior
* Contemporary garage door	

Maintenance Considerations

The structure is well-maintained.

6. Possible Restoration/Enhancement Measures

When the replacement of the garage door becomes necessary, a door with simple rectangular panelling, painted the color of wood doors and trim at the commanding officer's quarters, would be the first choice. Err on the side of simplicity.



5.9 General view of commanding officer's garage (Building 177).

Building No.: 178 Date Constructed: 1931

Area: 1,377 sq. ft.

Historical Use: 4-Car Garage, Officer Housing

Building: 178

Current Use: 4-Car Garage/Storage, Officer Housing

- 2. Historical and Architectural Significance See Garage General Comments 5.1.
- 3. Building Description/Condition

Description: Building 178 was a four-unit automobile garage. In 1932, four storage units were added, two on each side.

General Condition: The entire building, including plaster, trim and flashings appear to be in good condition. See Garage General Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements See Garage General Comments 5.3, 5.4
- 5. Maintenance Considerations No noticeable problems. See Garage General Comments 5.5
- 6. Possible Restoration/Enhancement Measures See Garage General Comments 5.6

Selected Photograph of Building Detail



5.10 Six car garage converted into garage/storage building.

Building No.: 179

Date Constructed: 1929

Area: 1,950 sq. ft.

Historical Use: 6-Car Garage, Officer Housing

Building: 179

Current Use: 6-Car Garage/Storage, Officer Housing

Historical and Architectural Significance See Garage General Comments 5.1.

3. Building Description/Condition

Description: Building 179 was a six-unit automobile garage. In 1932, three storage units were added to each side.

General Condition: The entire building, including plaster, trim and flashings appear to be in good condition.

See Garage General Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements See Garage General Comments 5.3, 5.4
- 5. Maintenance Considerations

No noticeable problems.

See Garage General Comments 5.5

Building No.: 180 Historical Use: 6-Car Garage, Officer Housing Date Constructed: 1929 Current Use: 6-Car Garage/Storage, Officer Housing

Area: 1,950 sq. ft.

2. Historical and Architectural Significance See Garage General Comments 5.1.

3. Building Description/Condition

Description: Building 180 was a six-unit automobile garage. In 1932, three storage units were added to each side.

Building: 180

General Condition: The entire building, including plaster, trim and flashings appear to be in good condition.

See Garage General Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements
 See Garage General Comments 5.3, 5.4
- 5. Maintenance Considerations

No noticeable problems. Good flashing all around.

See Garage General Comments 5.5

Building No.: 252 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 252 is a 1293 sf six-unit automobile garage, one of eight

Building: 252

such units in the NCO residential sector.

General Condition: The building appears to be in generally good condition.

See Garage Comments 5.2

4. Inventory of Contributing and Non-Contributing Elements
See Garage Comments 5.3, 5.4

5. Maintenance Considerations

No noticeable problems.

See General Comments 5.5

Building No.: 253

Date Constructed: 1932

Area: 1,293 sq. ft.

Historical Use: 6-Car Garage, NCO Housing Current Use: 6-Car Garage, NCO Housing

Building: 253

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 253 is a 1293 sf six-unit automobile garage, one of eight

such units in the NCO residential sector.

General Condition: The building appears to be in generally good condition.

See Garage Comments 5.2

4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4

5. Maintenance Considerations

No noticeable problems.

See General Comments 5.5

Building No.: 254 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 254 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector.

Building: 254

General Condition: The building appears to be in generally good condition, except for a rear corner of the building where it appears some deteriorated wood has simply been covered by a new piece of 1 x 6 trim. This should be evaluated.

See Garage Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements
 See Garage Comments 5.3, 5.4
- Maintenance Considerations

No noticeable problems other than as noted in 3, above.

See General Comments 5.5

Building No.: 255 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance
See Garage Comments 5.1

3. Building Description/Condition

Description: Building 255 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector.

Building: 255

General Condition: The building appears to be in generally good condition. However, at the left-hand edge of the building's front, near the bottom, moisture penetration is rotting the wood and peeling the paint.

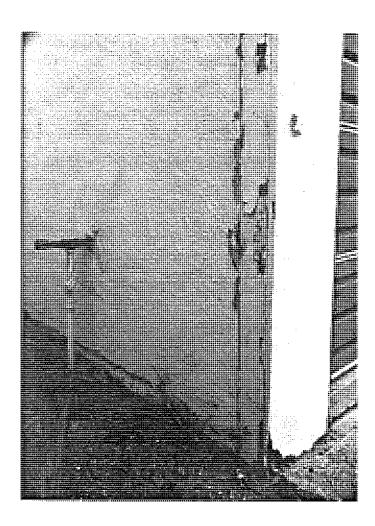
See Garage Comments 5.2

4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4

5. Maintenance Considerations

The deteriorating corner noted in 3, above, needs attention. This should generate an awareness of the problems which will arise where wood and standing water are brought together. The first thing to do is to insure that drainage is <u>away</u> from the structure. There are consolidants which can restore the wood, or, if necessary, the wood can be replaced. Then the stucco can be patched.

See General Comments 5.5



5.11 Effects of moisture penetration (Building 255).

Building No.: 256 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 256 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector.

Building: 256

General Condition: The building appears to be in generally good condition.

See Garage Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4
- 5. Maintenance Considerations

No noticeable problems.

See General Comments 5.5

Building No.: 257 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 253 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector. At this facade, bolts are clearly visible at each dividing wall, at about +4-1/2' and +7-1/2'. These are the bolts, anchored into the hollow clay tile which attach the new plastered wood facades to the old buildings.

Building: 257

General Condition: The building appears to be in generally good condition.

See Garage Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements
 See Garage Comments 5.3, 5.4
- Maintenance Considerations

No noticeable problems.

See General Comments 5.5

Building No.: 331 Historical Use: 11-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 11-Car Garage, NCO Housing

Building: 331

Area: 4,150 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 331 is a 4150 sf 11-unit automobile garage built for use in the NCO Quarters residential sector. It is the largest of the NCO garage structures, all the rest of the original structures accommodating 6 cars. There is a 6" differential in the building, approximately midway, in order to accommodate the change in street grade.

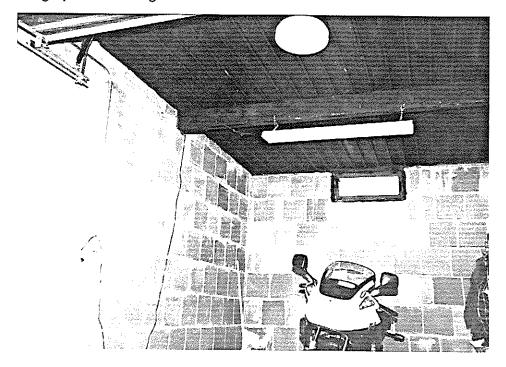
General Condition: The building appears to be in good condition.

- 4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4
- Maintenance Considerations

No noticeable problems. See General Comments 5.5

6. Possible Restoration/Enhancement Measures See General Comments 5.6

Selected Photograph of Building Detail



5.12 Typical exposed clay tiles on interior walls.

Building No.: 362 Historical Use: 6-Car Garage, NCO Housing Date Constructed: 1932 Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

 Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 362 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector. Unlike most of the garages, the wood facia is made of smooth rather than "rough-sawn" 1 x material. It appears to be replacement material that was installed when the buildings were recently reroofed.

Building: 362

General Condition: The building appears to be in generally good condition.

See Garage Comments 5.2

- 4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4
- 5. Maintenance Considerations

No noticeable problems.

See General Comments 5.5

Building No.: 364

Date Constructed: 1932

Historical Use: 6-Car Garage, NCO Housing

Current Use: 6-Car Garage, NCO Housing

Area: 1,293 sq. ft.

2. Historical and Architectural Significance See Garage Comments 5.1

3. Building Description/Condition

Description: Building 364 is a 1293 sf six-unit automobile garage, one of eight such units in the NCO residential sector.

Building: 364

General Condition: Except for the upper front corners, the building appears to be in generally good condition.

See Garage Comments 5.2

4. Inventory of Contributing and Non-Contributing Elements See Garage Comments 5.3, 5.4

5. Maintenance Considerations

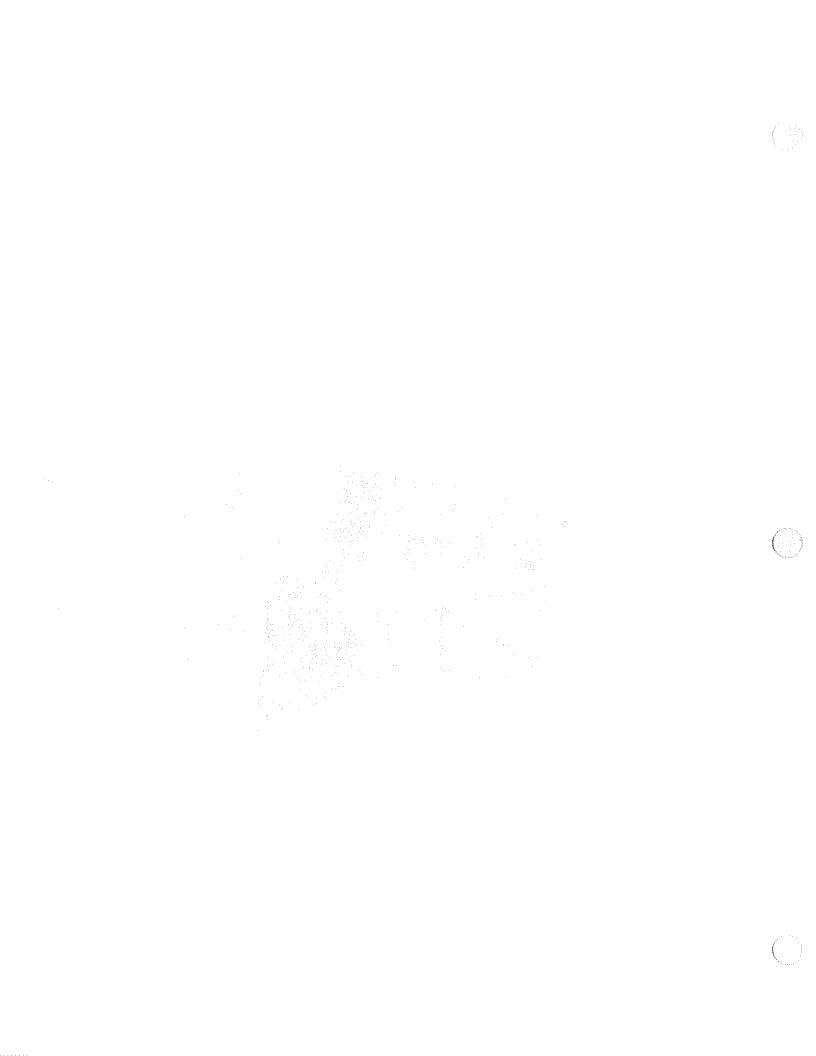
It appears that repairs to the facia that accompanied the recent re-roofing were not handled well at this building. At both front corners, the top of the plaster extension of the front walls has been hacked away in order for the wood facia to run, uninterrupted, from corner to corner. The result of the damage is that water has free access into the structure, and the wood behind the plaster is doomed to rot. Patched plaster and extensions of metal flashing downward over the missing plaster wall segments will be required to prevent further water damage. See General Comments 5.5

6. Possible Restoration/Enhancement Measures

See General Comments 5.6



5.13 Moisture damage at upper front corner.



6. Hangars and Hangar-like Buildings

Buildings Treated in This Section (Identified by Building Number):

300, 355, 373, 385, 429, 440, 452, 453, 457, 458.

6.1 General comments on integrity, maintenance, and restorative measures for eight hangars along flightline side of Graeber Street and two hangar-like buildings across Graeber Street

The March Field Historic District includes ten huge buildings along Graeber Street -- eight hangars and two maintenance buildings which closely resemble hangars. The eight hangars are located, of course, along the flightline while the two shop buildings are across Graeber Street, northwest of the parade grounds.

The hangars and hangar-like buildings were built as a group in 1929 from a standard plan that pre-dated the general design for March Field. The core of each building is a 200' by 110' clear span area enclosed by a gently sloping gable roof. For the eight hangars, this space was accessed by huge sliding doors with external frames. The hangar-like shop buildings were accessed by smaller doors at the sides.

The buildings were modified incrementally over the years, the bulk of these additions being made before 1943 and therefore within the period of significance for the historic district. The 1929-1943 additions served to differentiate further between the hangars and hangar-like shop buildings. During the 1929-1943 period, a series of one-story concrete additions were made to the long sides of each of the eight hangars; by 1943, the entire side elevations had been enclosed by these additions, which provided office space and additional storage for the hangars. While the additions resulted in a uniform exterior appearance, the sequence of construction and interior partitioning differed somewhat from one building to the next. No such additions were made to the two hangar-like buildings.

The construction history of these buildings is documented in old Quartermaster Corps maintenance records, in the possession of the Base Historian. Photographs attached to the Quartermaster documents for a number of the hangars clearly show a tile-like texture over the main structure. Hangar 457's photograph is clear enough to determine that the "tiles" were over two feet wide and with an exposed length of between 2-1/2 and 3 feet. Yet the roof's existing steel framing is so spaced that it does not appear to be compatible with supporting these tiles at that length interval. What this roof covering actually was cannot be verified from the Quartermaster documents (Photograph 6.1).

The "steel and reinforced concrete slabs" referred to in these documents, however, perfectly describe the roofing over the earliest 20-foot wide side bays (**Photographs 6.3 & 6.4**). These concrete slabs are supported by 8-inch steel channels at approximately 5 foot centers, running parallel to the hangar's ridge. It appears that perhaps with, or immediately after, construction of the hangars, these 20-foot square wings appeared at one or two corners of each hangar. From the remaining evidence, it appears that one wing served as a restroom facility. The other wing invariably had a concrete walled vault, approximately 4-feet wide, 8-feet long, and roofed with concrete at about 8-feet.

After this time, two more construction intervals occurred, based on physical and photographic evidence. The second phase, in the 1930s, added two (three in the case of Building 453) bays adjoining the original square wings, always on the runway side. A large aerial photograph in the Museum was taken at this time. It was taken looking southeast and aligned

with the hangars. The final phase appears to be the complete infill of both sides of the hangar. These documents indicate that the additions on the runway side were constructed in January, 1940, and the street side in February, 1941. Here, too, the walls are board-formed concrete, the windows industrial steel sash, the doors of panelized steel and the roof is reinforced concrete, sometimes board-formed, sometimes cast in plywood forms, and supported by open-web steel joists running perpendicular to the hangar's ridge. Sometimes these were bar-joists, but more frequently [probably due to wartime shortages], they were imitation bar joists whose "bars" are fabricated of light steel plate, about 2-1/2 inches wide, bent into a "U" shape to simulate the characteristics of a bar joist.

Finally, these annexes, although shown on every Quartermaster data sheet of the early 1940s, as 179'-11" x 19'-8-1/2" additions, do not reflect the actual case for the southwest (runway) side of the hangars. On that side, the January 1940 construction had to have consisted of 6, 7 or 9 bays, completing the infill of that side. The notations on the older (1929) Quartermaster documents showing the hangars confirms the above.

It must be noted of the photographs attached to these Quartermaster documents for the hangars are only partly accurate. The photographs of the hangar's runway side, on the 1940s documents, appears to be accurate (at least different) for each of the eight hangars. The street side photograph is identical in all cases. Because of the hangar visible immediately behind the one in the photograph, it is impossible for this photograph to be of Hangars 300 or 429. Likewise, the photographs attached to the 1930s documents are all identical.

After World War II, the hangars were gradually abandoned for their original purpose and adaptively re-used for a variety of purposes. Indeed, each building has been put to a variety of uses as new functional units has occupied it. Gradually, each building was modified to suit the new tenants. The two hangar-like shop buildings were modified as well to serve new tenants. In their current condition, the hangars are no longer uniform in appearance. The eight hangars reflect a broad spectrum of historic integrity, from nearly intact to heavily modified. Similar, the two hangar-like buildings have been modified to varying degrees, with one (Building 453) being nearly intact, the other (Building 458) being heavily modified. Building 458 was enlarged through a huge concrete block addition. The addition, nearly as large as the original, detracts substantially from the integrity of the building but does retain the basic geometry of the roof line.

For these reasons, it is difficult to characterize the hangars and hangar-like buildings in terms of historical integrity. For the hangars, integrity may be analyzed in terms of three major elements: the exterior; the interior of the hangar area; and the interior of the side annexes. For the hangar like buildings, integrity relates to the exterior and the hangar-like clear span area; there are no side annexes for these buildings.

As a group, the hangars and related maintenance buildings appear to be in excellent physical condition. The walls, the building geometry, its shape and its structure are essentially unchanged from before WWII. With relatively few exceptions original windows and hangar doors survive. Many original personnel doors survive, particularly at the exterior on the runway side. A few original interior partitions and doors appear to have survived as well, and it is important that these few remaining interior features, along with a small amount of original lighting, all of which are noted under the specific hangars, be preserved.

In terms of maintenance recommendations, two major sets of problems appear to be common to all of the buildings: leaky roofs and problems with roof drainage. The two are not unrelated in some cases. In most cases, the leaky roofs appear to be caused by breaks in the welding

which binds metal plates together. The breaks in turn appear to be caused by wind motion, which lifts the plates. A very high priority should be assigned to repair of these metal plates. The drainage system of gutters and downspouts is less important in protecting the high pitched gable clear span area but is of considerable value in protecting the essentially flat roofed side annexes of the hangar buildings, which receive the run off from the gabled areas. The rambling system of gutters, leaders, and downspouts must be carefully maintained or it will threaten the flat roofed annex areas. The system does not appear to warrant replacement except in selected areas.

The restoration potential for these huge buildings is quite high because the buildings retain a generally good degree of integrity. These recommendation differ from one building to the next, however, because the buildings have been modified in different ways. The greatest payback in terms of historic preservation and public values would be found in restoring the Graeber Street elevations of the eight hangars as well as the two hangar-like buildings. One relatively inexpensive class of projects would involve removal of the unneeded clutter of utilities along the Graeber Street side of these buildings. Another series of projects, quite inexpensive, would involve removing paint and other dark surfaces from the windows, opening the spaces to natural light. Each functional unit would need to evaluate the rationale for blocking off these windows. In many cases, the natural light would prove energy efficient in addition to restoring the intended historical appearance of the building.

6.2 Contributing Elements of Hangars and Hangar-Like Buildings

The 10 hangars and hangar-like buildings commonly include the following contributing elements:

Exterior features:

Painted board-formed concrete walls.

Original industrial steel sash, most of it horizontally pivoted.

Original drawn glass where it occurs, original wire glass where it occurs, and original obscure glass where it occurs.

Original copper rain gutters, collectors, rainwater leaders and the massive cast concrete splash blocks.

Original main hangar doors, including their steel fabrication, their steel rollers, their steel cladding, their obscure wire glass windows, and the supporting framework that extends beyond the hangar walls.

Original panelized steel personnel doorss and door frames.

(The old Air Corps star symbol on the gable ends of the hangars (Photograph 6.9), while not original, is emblematic of the history of the district and could continue to serve a valuable role in the identification of those buildings which comprise the historic district. Consideration might be given to so identifying all such buildings in the district, as a means of setting them apart - not only for the visitor, but also for those whose responsibility it is to protect these historic resources.)

Interior features:

Lightweight steel truss system and cross-framing. Industrial steel sash and their chain-operated opening mechanisms. Original metal doors and frames. WWII era lighting fixtures. Exposed board-formed concrete wall textures.

Poured-in-place concrete roofs and their steel supports.

Fragments of original restrooms.

Remaining WWII era partitions, wood doors, doorframes and wainscots.

6.3 Non-Contributing Elements of Hangars and Hangar-Like Buildings

The 10 hangars and hangar-like building commonly include the following non-contributing elements:

Exterior Features:

Painted corrugated roofing (appropriate although not original).

Unpainted corrugated roofing.

Damaged and/or missing gutters, collector boxes, rainwater leaders and splash blocks.

Crudely fabricated rainwater collector boxes and rainwater leaders.

Concrete, concrete block, wood or stucco infill or partial infill of locations where original windows or doors existed.

Infill wall sections originally occupied by hangar doors.

Replacement windows which do not repeat the geometry and or the materials of the original windows.

Painted-over windows. (This is the least intrusive closure of windows because it retains the original materials.)

Equipment, equipment fences and other constructions on the street and/or principal facades.

Interior Features:

The intrusion of enclosed shops, offices, etc, within the original hangar space constitutes a clear and significant non-contributing element. However, it is recognized that even more of these may be necessary to retain the viability of the hangars; and they are (or should be constructed to be), in the final analysis, all reversible.

Inset panels in the plane of the hanger doors.

Infilled or altered windows and personnel doors.

Post-WWII remodelling work, including partitions, doors, and suspended ceilings.

Post-WWII ceilings across hangar space, concealing the roof structure.

6.4 Condition of Hangars and Hangar-Like Buildings

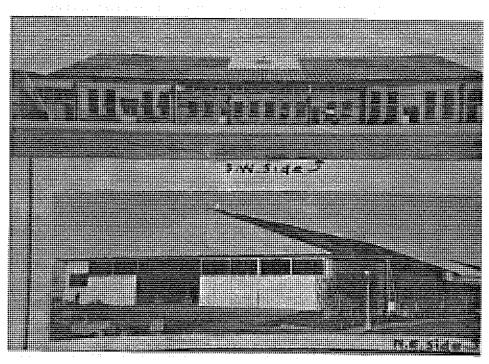
As a group, the hangars and maintenance buildings appear to be in good physical condition. The walls, the building geometry, its shape and its structure are essentially unchanged from before WWII. With relatively few exceptions original windows and hangar doors survive. Many original personnel doors survive, particularly at the exterior on the runway side. A few original interior partitions and doors appear to have survived as well, and it is important that these few remaining interior features, along with a small amount of original lighting, all of which are noted under the specific hangars, be preserved. At nearly every hangar however, there was evidence of and complaints of roof leaks.

6.5 Potential Restoration Work for Hangars and Hangar-Like Buildings

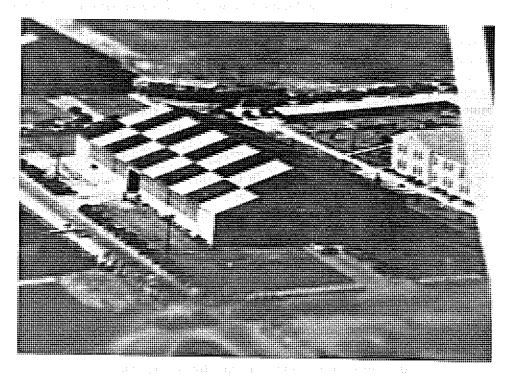
These elements are being listed in order of the significance of their visual impact. Restorative or corrective measures should be implemented whenever use or maintenance provides the

opportunity. However, because of the potential for further damage, situations which involve moisture infiltration should always be addressed as soon as practicable.

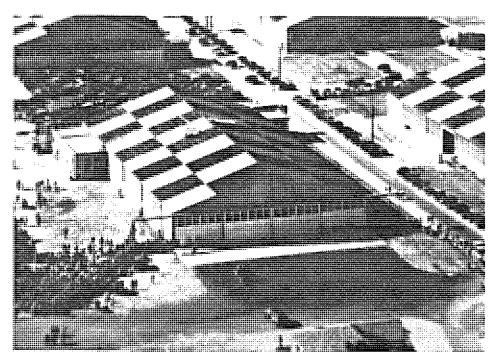
- 1. <u>Board-formed concrete walls:</u> Insure that the texture remains visible. Do not use more than medium pressure waterblasting to clean. Sandblasting the surface will destroy it.
- 2. <u>Hangar doors</u>: Retain these doors, repairing as needed. If future use dictates a solid wall in these locations, erect that wall behind the doors. These structures lose their historic perception as hangars when the large doors cease to be a part of the composition. Personnel doors historically were integrated into the original doors, and larger vehicular doors can be provided behind moveable sections of the large original doors. Where original doors no longer exist, reproduction doors, or doors or panels which are sympathetic to the original in character, geometry, texture and color are appropriate.
- 3. Steel industrial sash and glass: The importance of the texture which these windows with their small panes of glass give to the composition of this resource cannot be overstated. Ideally, the goal should be to restore all the windows which are removed, infilled and/or otherwise covered. Industrial steel sash is being fabricated again in Southern California, making restoration feasible. There are only two reasons to avoid windows light/weather infiltration and security. The technology exists to overcome these concerns without physically eliminating the window as is perceived from the exterior. Preservation's long-term goal should be to restore the exterior appearance, especially the historic window patterns, as new uses and new tenants occupy the spaces within. Every effort should be made to retain the chain-operated opening devices for the high windows. Ideally, they should be made operable. If not, they should be abandoned in place rather than removed.
- 4. <u>Hangar roof:</u> The original "checkerboard" roofs are gone from the hangars, but the corrugated replacements have been a part of the historic composition long enough to warrant protection. Currently, the two southeasternmost hangars have corrugated roofs which are quite reflective. This diminishes the historic character of these hangars. They should receive the same type of coating that covers the other hangar roofs. It would not be inappropriate if, in the future, the roof coating is applied to all the hangars in a faded checkerboard pattern reminiscent of the original. However, it is essential to repair—or even better—to prevent leaks.
- 5. <u>Hangar roof framing:</u> The 110' trusses at 20' intervals, which span the hangar and which were originally fabricated for another project, are an important historic element of this resource. An effort should be made to not impose or remove loads which would require alteration of the historic system.
- 6. <u>Historic exterior doors:</u> Found mostly on the runway side of the hangars, it appears that at least half the existing doors are part of the original construction. Some are badly rusted and otherwise deteriorated. They are extremely poor insulators of air-conditioned space. Yet where it is possible to do so, they should be retained. Where they cannot be retained, they should be salvaged for utilization elsewhere or as a future authentic replacement.
- 7. <u>Historic interior partitions, doors and trim:</u> Occurring only rarely, in the wings of only one or two hangars, every effort should be made to retain these last remaining fragments of a pre-WWII interior.
- 8. <u>Historic lighting:</u> Even rarer than the interior partitions, these original industrial lighting fixtures should be preserved, and if possible, put back into use.



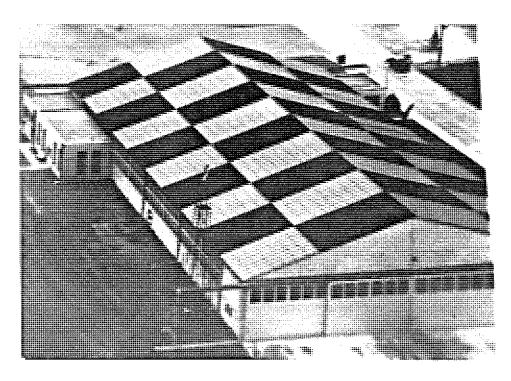
6.1 Hangar, 1929 (Building 457).



6.2 Aerial view of hangar, 1933 (Building 458).



6.3 Aerial view of hangar, with addition (Building 457).



6.4 Aerial view of hangar, with addition, 1937 (Building 385).

Building No.: 300
Date Constructed: 1929

Area: 31,108 sq. ft.

Historical Use: Hangar

Building: 300

Current Use: Shop

2. Historical and Architectural Significance

Building 300 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

3. Building Description/Condition

Description: Building 300 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

The building is largely unchanged since 1943. Offices in the "sidebar" buildings have furred walls and suspended ceilings, but there has been no wholesale removal of historic fabric, except replacement of roofing material. Many of the windows have been painted over and some are infilled with masonry. One original door remains on the Graeber Street elevation, but most of the doors on the flight line side are original, as are the original hangar doors at each end of the building.

General Condition: Light is visible through the western edge of the hangar roof. Some 25' of flashing was blown off in the recent past. Building users state that, flashing or no, there are leaks in the roof. In every other respect, the building, although clearly worn, is holding up well.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Contributing Elements:

Chain-operating mechanisms for high windows.

Non-Contributing Elements:

Shops/offices in hangar space.

Suspended ceilings which extend below the window tops.

5. Maintenance Considerations

The flashing on the west end of the northwest gable has been blown off, and requires replacement.

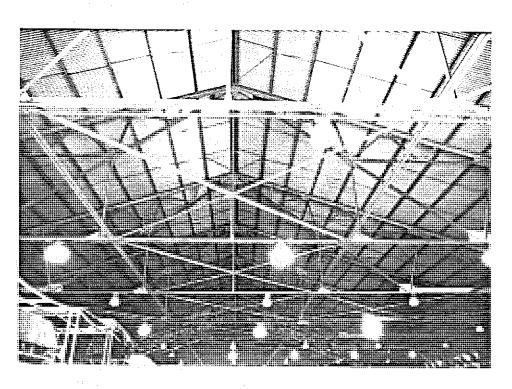
Southwest elevation: (from left to right) Downspout #2 appears to be clogged, downspout #5 has no diverter.

A section of flashing along the southeast gable appears raised and somewhat damaged.

Roof reported to leak.

6. Possible Restoration/Enhancement Measures See General Comments and Comments on Hangars

Selected Photograph of Building Detail



6.5 Steel trusses and replacement corrugated metal roofing.

Building No.: 355 Historical Use: Hangar Date Constructed: 1929

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 355 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 355

Current Use: Shop

3. Building Description/Condition

Description: Building 355 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

The southernmost element of the flightline "sidebar" building contains a stairway leading to a small non-original mezzanine. At the northern end of the northwest hangar doors, an infill panel of approximately 8' width has been inserted, making provision for a man-door at this location. Many original doors remain, particularly on the flightline side.

General Condition: Apart from reports of a leaky roof, the building, though shopworn, appears to be in good condition.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:

Chain-operated window opening mechanisms.

Fluted wire glass.

Noteworthy Non-Contributors:

Dropped ceilings, extending below the window tops.

5. Maintenance Considerations

On the southeast side, the flashing over the hangar doors appears damaged at two separate locations.

On the northwest side, a significant length of flashing has been blown away at the top of the gable.

On the Northeast (street) side, the clutter of equipment and equipment pads detracts from the historic composition.

On the flightline side, the westernmost rainwater collector is damaged and should be repaired.

6. Possible Restoration/Enhancement Measures

See General Comments and Comments on Hangars

Building No.: 373 Historical Use: Hangar Date Constructed: 1929 Current Use: Shop

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 373 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 373

3. Building Description/Condition

Description: Building 373 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

General Condition: Apart from some flashing problems at both ends of the building, it appears to be in very good, if altered, physical condition.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:
None

Noteworthy Non-Contributors:

An effort to "update" the appearance of this building has resulted in some major negative impacts on its historic integrity:

- 1. The removal of all the original windows and replacement with muntin-less slabs of smoked glass.
- 2. The "entrance canopy" at Graeber Street.
- 3. The concrete screen-block walls along Graeber Street.

- 4. Infill labs/offices/shops in the main hangar area.
- 5. The reflective surface of roof for this hangar is out of character with the roofing materials on the six other hangars.

5. Maintenance Considerations

At the northwest elevation, a 20' length of flashing has blown off the top of the gable. It needs to be replaced.

At the southeast elevation, the flashing over the original closed doors appears to be quite battered. An examination is warranted to insure the flashing continues to provide weather protection.

6. Possible Restoration/Enhancement Measures

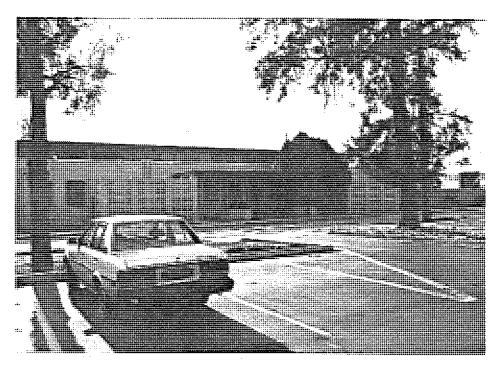
See General Comments and Comments on Hangars

The total loss of the original windows is a negative impact of major proportions. The ultimate goal for this building should be the restoration of the original, strongly character-defining windows.

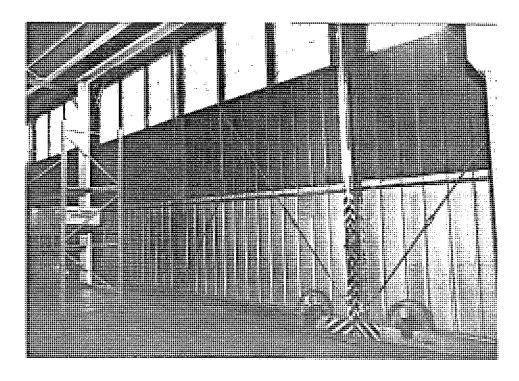
Selected Photograph of Building Detail



6.6 Muntin-less smoked glass replacement windows.



6.7 Concrete screen-block walls on Graeber Street (Building 373).



6.8 Inside of sliding hangar doors (Building 373).

Building No.: 385

Date Constructed: 1929

Historical Use: Hangar

Current Use: Shop

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 385 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 385

3. Building Description/Condition

Description: Building 385 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span (Photograph 6.9). Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

This is one of the few fully fire-sprinklered buildings.

General Condition: Apart from reports of a leaky roof, the building, though shopworn, appears to be in good condition.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:

Operable clerestory windows.

Noteworthy Non-Contributors:

The newer, shinier finish of the roof on this hangar (like that for Building 373) is out of character with the remaining roofs.

5. Maintenance Considerations

Leaky roofs are reported. Drainage of flat roof needs monitoring (Photograph 6.11).

On the northwest gable end, there appears to be a lifting of the flashing which could cause water leaks.

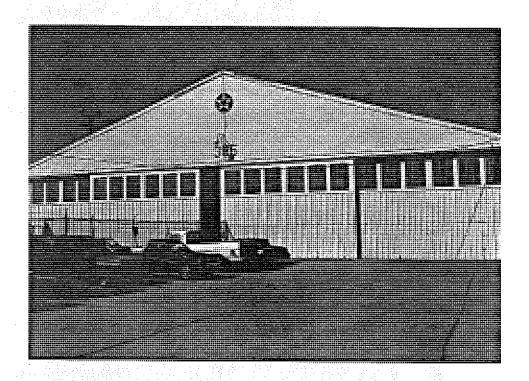
On the southeast side, a section of flashing near the ridge is missing.

Southeast elevation; the south end of the flashing over the hangar doors appears torn and rusting.

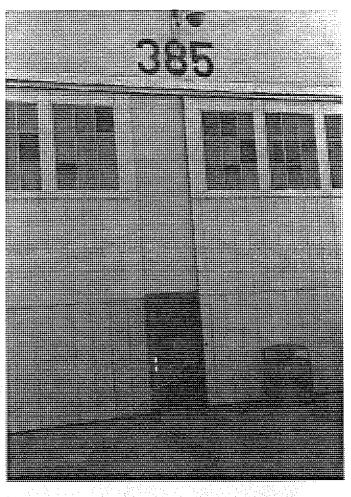
Some of the original man-doors are suffering from rust and corrosion.

6. Possible Restoration/Enhancement Measures See General Comments and Comments on Hangars

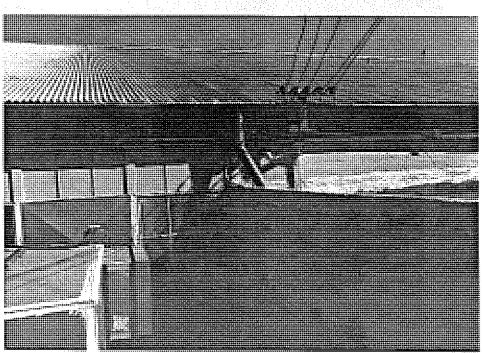
Selected Photograph of Building Detail



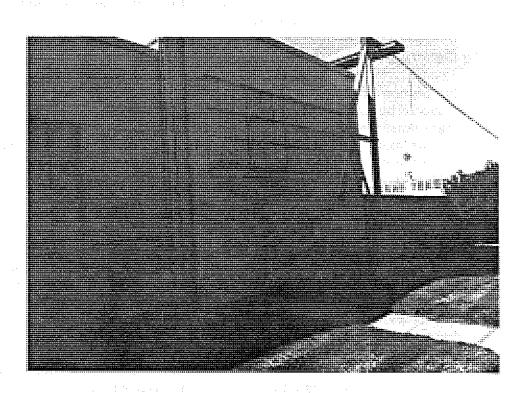
6.9 Massive sliding hangar doors.



6.10 Man door installed between hangar doors, an appropriate, reversible solution for providing needed access (Building 385).



6.11 Evidence of water damage on flat roof wings (flightline side, Building 385).



6.12 Painted out original industrial sash (Building 385).

Building No.: 429

Date Constructed: 1929

Area: 31,308 sq. ft.

Building: 429

Historical Use: Hangar Current Use: Shop

2. Historical and Architectural Significance

Building 429 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

3. Building Description/Condition

Description: Building 429 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

This building appears to be among the least altered of the hangars. Most of the doors are original and the windows are intact, although painted-over. Even most of the original concrete splash blocks are in place. In the east corner room, original light fixtures still hang from the ceiling. Both original hangar doors are in place. In the northwest hangar door appears an original, or very early, man-door. The construction of the triangular gable element is discernable above the southeast hangar doors: lightweight framing, chicken wire and plaster.

General Condition: The condition of the hangar, despite its years, is good, although it is reported that the roof leaks.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:
Original lighting fixtures, easternmost room.

High number of original windows and doors. Intact "vault" in southernmost room.

Noteworthy Non-Contributors:

A large transformer and related equipment negatively impacts the Graeber Street elevation.

Two evaporative coolers intrude on the flightline elevation.

5. Maintenance Considerations

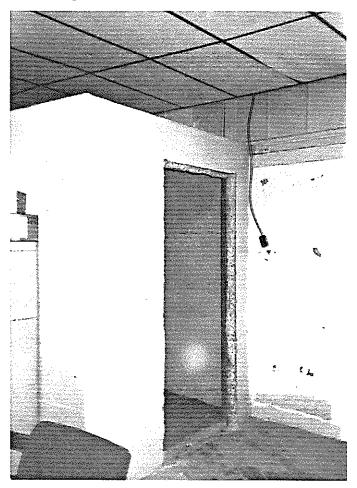
On the southeast side, hangar door flashings appear to be in need of repair. The northwest hangar doors appear to have some recently-installed flashings in two locations.

The northeast side looks very good except for one damaged downspout.

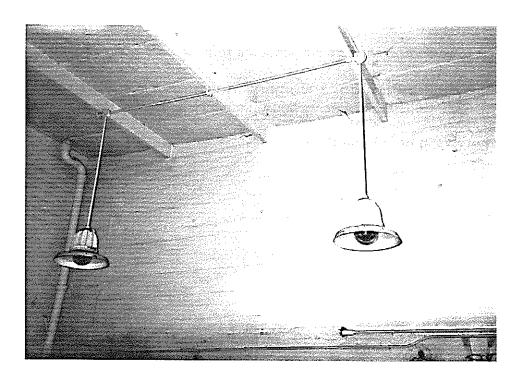
The southwest side also appears to be in very good condition.

6. Possible Restoration/Enhancement Measures See General Comments and Comments on Hangars

Selected Photograph of Building Detail



6.13 Hangar vault.



6.14 Original light fixtures in easternmost wing (Building 429).

Building No.: 440 Historical Use: Hangar Date Constructed: 1929 Current Use: Shop

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 440 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 440

3. Building Description/Condition

Description: Building 440 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8" board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

The southeast facade has been significantly altered by the total removal of the hangar doors and their supporting outriggers, and their replacement with a metal-clad wood stud wall containing a large vehicle door and a pair of mandoors.

Also noteworthy at this hangar are both good and bad examples of dealing with suspended ceilings and windows in the "sidebars". At one location, the lowered ceiling stops 12" short of the windows, and rises to meet the original window head. The original windows are still in place and operable. At another location, there exists a replacement window, a mirrored casement, whose transom, at the exterior is plastered over so that the suspended ceiling can ignore the original window height. While there are more of the latter (inappropriate) windows than good original ones on the Graeber Street facade, the contrast is quite educational.

The southernmost room contains the original vault over which is extended a second level supported by steel rods, and accessed by a steep stairway.

Outside, near the south corner of the building are two shade canopies which are good examples of simple and reversible additions which do not detract from the historic resource.

General Condition: The condition of the hangar, despite its years, is good, although it is reported that the roof leaks.

4. Inventory of Contributing and Non-Contributing Elements

See General Comments on Hangars

Noteworthy Contributors:

Those clerestory windows which are not painted over.

Noteworthy Non-Contributors:

Replacement of hangar doors with wall across entire opening, southeast end of building.

Replacement windows with mirrored glass and plaster transoms.

Bronze anodized/glazed doors along Graeber Street.

Unusually high number of windows lost to plaster and block infill.

HVAC and electrical equipment along Graeber street.

5. Maintenance Considerations

On the northwest side, the flashing over the hangar door appears to be in need of repair.

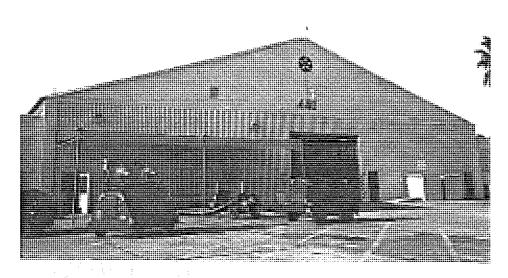
On the northeast side, toward the center, peeling paint is noticeable. This bears investigation, as it could be evidence of moisture infiltration.

There are reports that the roof leaks.

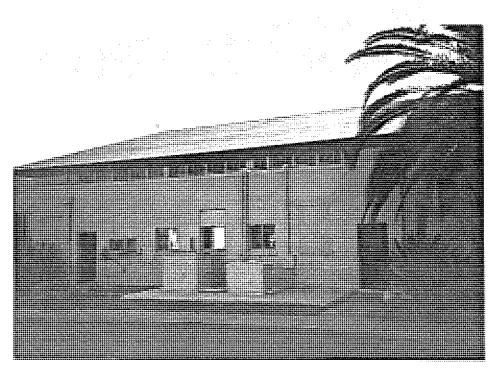
6. Possible Restoration/Enhancement Measures

See General Comments and Comments on Hangars

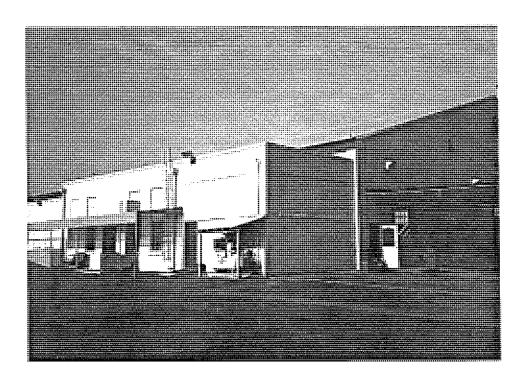
The loss of the hangar doors on the southeast side of this hangar constitutes a major negative impact. Long range planning should include their restoration, or the construction of a wall which visually reproduces the character of the original doors. If future use dictates a solid wall where hangar doors still exist, erect that wall behind the doors. These structures lose their historic perception as hangars when the large doors cease to be part of the composition.



6.15 Metal clad stud wall on southeast elevation (Building 440).



6.16 Plastered over transoms and windows on Graeber Street sidebar (Building 440).



6.17 Shade canopies, an easily reversed modification (Building 440).

Building No.: 452
Date Constructed: 1929
Historical Use: Hangar
Current Use: Shop

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 452 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 452

3. Building Description/Condition

Description: Building 452 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8"board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

Noteworthy here is a plastered ceiling covering the hangar just below the trusses. It is probably part of early conversion efforts from hanger to shop use.

This is the only hangar building with a significant two-story element inserted within. Fire exiting requirements have dictated an exit at the level of the clerestory windows along Graeber Street, and a steel exit stairway on this facade.

There is also a paint shop taking up the westernmost one-quarter of the hangar space, surrounded by walls to the ceiling and serviced by massive air-handling equipment ducted in from the flightline side of the building. Additionally, the dividing wall between the hangar space and the "sidebar" has been removed for approximately 2-1\/2 bays at the western corner of the hanger, integrating it into the paint shop.

General Condition: In spite of heavy use, the basic condition of the building remains good.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:

Original "sidebar" space on flightline side of building, showing the exposed concrete structure of walls and ceiling.

Unaltered, operable, tall industrial steel sash within the above mentioned space.

Noteworthy Non-Contributors:

Infilled hangar spaces.

Fire stairs and equipment on Graeber Street elevation.

Large number of blocked windows on Graeber Street elevation.

Massive ventilation equipment on flightline side.

Second-story "picture window" behind hangar doors, northwest elevation.

5. Maintenance Considerations

No apparent maintenance problems, and no reports of roof leaks.

6. Possible Restoration/Enhancement Measures
See General Comments and Comments on Hangars.

Selected Photograph of Building Detail



6.18 Inappropriate second story window on northwest elevation.

Building No.: 453 Historical Use: Aircraft Repair Shop

Date Constructed: 1929 Current Use: Shop

Area: 25,443 sq. ft.

2. Historical and Architectural Significance

Building 453 is one of two hangar-like contributing buildings located in the historic Quartermaster Corps sector of the base. Building 453 is one of the largest industrial buildings, with a geometry matching that of the hangars, but across Graeber Street from the flightline. The industrial buildings together form an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

Building: 453

3. Building Description/Condition

Description: Building 453 is the original aircraft repair shop and is nearly identical in appearance and construction to the hangars across Graeber Street. The only notable difference between it and the hangars is the absence of the hangars' wide doors and 20' wide support spaces added to the hangars between 1929 and 1941. Except for a very small addition to the northwest, this 1929 structure is almost completely unmodified and is a key contributor to the old Quartermaster area of the base. Except for the lowest band on the southwest side, all the windows, although still existing, are painted out.

Condition: The condition of this building appears to be very good.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:

It appears that all the original windows are still in place.

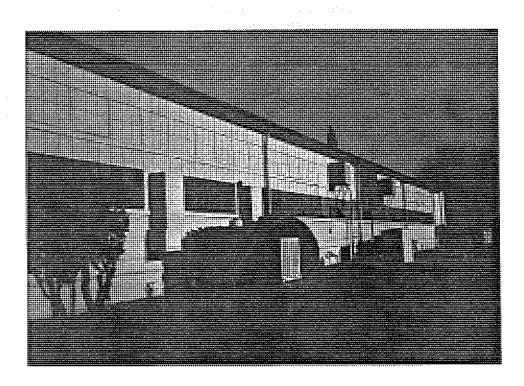
Noteworthy Non-Contributors:

Major equipment, appropriately sited at the rear of the building.

5. Maintenance Considerations

Apart from about ten feet of flashing at the northwest gable, which needs attention, there appear to be no significant maintenance concerns.

6. Possible Restoration/Enhancement Measures See General Comments and Comments on Hangars



6.19 Original industrial steel sash in place, but largely painted over (Building 454).

Building No.: 457

Date Constructed: 1929

Historical Use: Hangar

Current Use: Shop

Area: 31,108 sq. ft.

2. Historical and Architectural Significance

Building 457 is one of eight contributing hangars within the March Field Historic District. The hangars represent the functional historical core of the old air base and collectively represent the most visually impressive component of this historic district. Although not in the Mission Revival style of the rest of the district, the hangars are compatible with the district generally and comprise one of its most important sectors.

Building: 457

3. Building Description/Condition

Description: Building 457 is a 31,108 sf hangar, now used as a shop. It is a standard hangar for March AFB. The hangars were originally built with a core that measures 200' x 110'. This space is clear-spanned by lightweight steel trusses spaced at 20' intervals and supported on 20' steel columns. Walls are 8"board-formed, reinforced concrete. The original roofing has been replaced with corrugated metal. All the hangars feature an exterior frame in each corner to support the massive sliding doors, allowing for full access to the 110' clear span. Each structure is oriented with its long sides and the roof ridge parallel with Graeber Street. All eight hangars were originally fitted with one or two 20' square ancillary spaces next to the door supports. These were routinely roofed with poured-in-place concrete, sloped to drain, and concealed by a parapet. By 1941, the entire space between the door supports, along both sides of the building had been incrementally filled in with a 20' wide service space. These spaces were also constructed of board-formed concrete, with poured-in-place concrete roofs. This longitudinal composition along the hangar's side walls is somewhat articulated by the parapet heights of the incremental infill, but the consistency of board-formed concrete walls and industrial steel sash windows unites all the elements into a compatible composition.

There exist, within the Graeber Street "sidebar", wood framed partitions, doors and wainscots which appear to be either original or dating from WWII. These are rare remaining elements worthy of protection.

On the opposite side of the hangar, at the west end of the building, a second level has been constructed within the "sidebar". Although low-ceilinged, the space makes use of original windows which were located high in the sidebar space, and other very tall windows in other of the sidebar spaces. This illustrates the flexibility and adaptability of the original spaces and the original fenestration.

There are two significant alterations to the exterior of this building: First, is a small (approximately 10' x 20') adobe addition to the Graeber Street facade. Its roof is wood, essentially flat. No one seems to know its reason for being there, although it was likely built by a Depression Era work force. Second, the southeast facade has lost one side of its hangar doors, which have been replaced by "5-score" concrete block up to about 8', surmounted with plywood

panels which have been oversprayed with colored gravel, and are now beginning to show signs of delamination at the edges.

General Condition: Apart from reports of roof leak, and evidence thereof within the building just south of the location of the adobe, the only noticeable maintenance problem appears to be the delaminating plywood at the southeast side of the building.

4. Inventory of Contributing and Non-Contributing Elements

See General Comments on Hangars

Noteworthy Contributors:

None

Noteworthy Non-Contributors:

Infill wall on southeast side of building.

Small adobe addition to Graeber Street facade (The adobe was apparently built during the period of significance, but distracts from the 1929 hangar design).

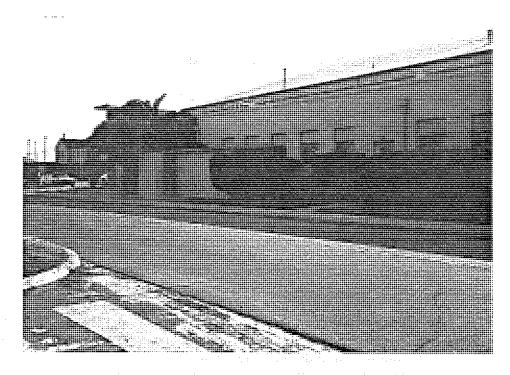
5. Maintenance Considerations

See "General Condition" above

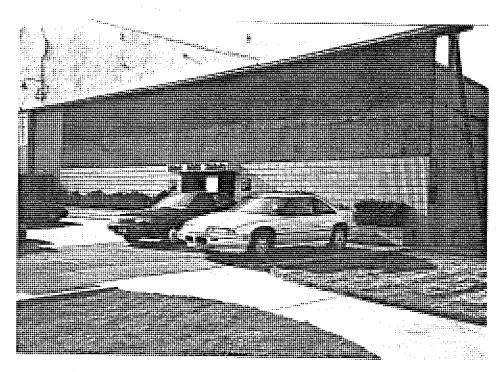
6. Possible Restoration/Enhancement Measures

See General Comments and General Comments on Hangars

The infill southeast wall is a major visual intrusion. Because of its very prominent location facing the Headquarters Building, proper long-range planning should include the restoration of these doors. If their reproduction is impossible, the relocation of hangar doors from a less prominent location (say the northwest side of Hangar 429), and their reinstallation at this building, should be considered.



6.20 Small adobe addition on Graeber Street side (Building 457).



6.21 Concrete block and plywood panel replacement for hangar door (Building 457).

Building No.: 458 Historical Use: Aircraft Repair Shop
Date Constructed: 1929 Current Use: Shop

Area: 325,812 sq. ft.

2. Historical and Architectural Significance

Building 458 is one of two hangar-like contributing buildings located in the historic Quartermaster Corps sector of the base. Building 458 is one of the largest industrial buildings, with a geometry matching that of the hangars, but across Graeber Street from the flightline. The industrial buildings together form an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

Building: 458

3. Building Description/Condition

Description: Building 458 is the original Air Corps warehouse and was nearly identical in appearance and construction to the hangars across Graeber Street. (It was a twin to Building 453 when constructed.) It was modified in 1956, however, through construction of a large concrete block addition, which extends the building about 80' to the northwest. Although a substantial modification, the addition is generally sympathetic to the design, maintaining the original roof line; and did not result in destruction to significant elements of the original structure. A smaller (800 sf), single story, concrete block restroom and office addition exists at the opposite (south) end. Despite these modifications, the building contributes to the historic district. A relatively small segment of the original building, at the northwest end, has a two-story structure within it. More than half of the large addition accommodates a second floor.

General Condition: The general condition of this building is very good, with even a number of the original windows in working order.

4. Inventory of Contributing and Non-Contributing Elements See General Comments on Hangars

Noteworthy Contributors:

Heavy pilasters, rising 3/4 of the way to the roof trusses, and surmounted by a sharply sloping cap, flank the original vehicular doorways at each end of the original building.

The glass in the windows, like a great many others in the district, is reinforced with chicken wire--the original "wire glass". Here, because of the unpainted glass, the pattern is evident. This glass is historically significant and should not be destroyed.

Noteworthy Non-Contributors:

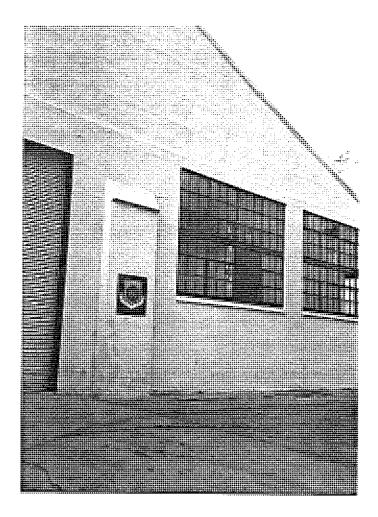
Concrete block additions at each end of the building.

5. Maintenance Considerations

On the northeast side of the building, most of the downspouts are cut off about 5' above grade. This needs to be remedied. Paint discoloration is already evident on the wall.

6. Possible Restoration/Enhancement Measures
See General Comments and Comments on Hangars.

Selected Photograph of Building Detail



6.22 Industrial steel sash with original reinforced glass.



7. Barracks (Dormitories)

Buildings Treated in this Section (Identified by Building Number):

311, 400, 456

7.1 General comments on integrity, maintenance, and restorative measures for three barracks (dormitories)

The March Field Historic District includes three huge barracks (now generally called dormitories) for enlisted personnel. The barracks are among the largest and most elegant buildings within the historic district, rivalling buildings 100, and 323 in architectural sophistication. They are also key structures from the functional standpoint, collectively housing nearly 1000 enlisted personnel at March Field during the period of significance. Although modified somewhat by conversion from large open sleeping areas to a dormitory living arrangement, the buildings overall retain a high degree of integrity and should be regarded as a key contributing element of the district.

The barracks were built in two periods, with Buildings 311 and 400 being built in 1929 and Building 456 being built one decade later. The buildings are all fundamentally the same. Building 311 is a dormitory building of about 60,000 sf. It is a two-story reinforced concrete building with gabled roof forms, built in 1929. There are three essentially identical barracks at March AFB: this building and Building 400, both built in 1929, and Building 456, which was built in 1939. The three huge C-shaped buildings, each built around an inner courtyard, are the most distinctively Mission Revival buildings within the historic district. Being C-shaped, each barracks includes six major elevations (three facing the courtyard and three exterior elevations), as well as two small elevations at the end of the wings. The three courtyard elevations are dominated by a continuous two-story arcaded loggia, the most dominant element of the composition. The side and rear elevations include a bank of paired rectangular window openings. The only arched opening outside the courtyard is a porch, centered on the rear elevation. This porch is one-story in Buildings 311 and 400 but two-story in the 1939 building. The roof for each barracks comprises long gabled forms, which extend the length of the rear and each major wing, with small cross gabled elements at the courtyard side of each wing, i.e.. at the termini of the two story loggia.

The loggia surrounds the courtyard on three sides. Arched openings at the first story are twice as wide as those on the second story, creating an interesting rhythm in which second story piers are alternately centered on the crest and piers for first story arches. The loggia is also the location for the most character-defining architectural details: pilasters about the principal first-story entry; cast stone surrounds for the second story balcony; a buttress form for the corners of the loggia (Photographs 7.1 & 7.2).

7.2 Contributing and Non-Contributing Elements

Each barrack building has been modified, although these changes are slight on the exterior elevations when considered against the scale of the building. Interior spaces have been altered completely by partitioning of dormitory sleeping quarters into small apartments. The partitioning was handled differently in Buildings 311 and 400, on the one hand, and Building 456 on the other. In 311 and 400, access to the apartments is gained through a series of entries on the exterior, each of which gives access to four apartments. In 456, access is gained through long, double-loaded hallways which are original to the building. This difference in the original internal circulation patterns has resulted in differing exterior changes, specifically

the blocking off of unneeded doorways and the transformation of some windows into new doors. The in-fill is generally denoted by concrete block construction. The other notable change was replacement of nearly all windows; the original windows, either steel or wooden casements have been replaced with double-hung aluminum sash. See attached forms for individual buildings for a list of contributing and non-contributing elements.

7.3 Maintenance Considerations

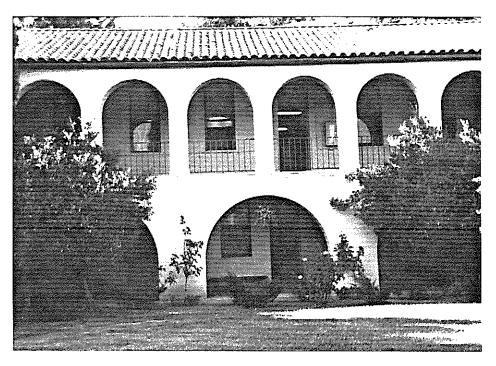
In terms of maintenance for these buildings, the dormitories appear to be in remarkably good condition, requiring only marginal work. Observed maintenance deficiencies include loose and misplaced roof tiles and non-functional downspouts, rainwater leaders, and gutters.

Maintenance concerns are individualized; see attached forms for individual buildings for a list of maintenance considerations.

7.4 Possible Restoration/Enhancement Measures

The restoration potential for these buildings appears to be largely restricted to windows and doors. The current windows were installed in the mid-1970s and are not likely to be programmed for replacement in the near future. As these windows begin to fail, however, the base should seriously consider returning to a casement design, irrespective of the materials that would be used. The pay-off would be dramatic in terms of historic values -- the huge banks of windows in the dormitories are among the most visible elements anywhere in the historic district -- and would likely result in a more usable product. The window openings appear to be very large for an aluminum double-hung design, apparently resulting in poor performance. Many opened windows observed during field work for this report were jammed or propped open, indicating poor performance in the double-hung mechanism. A casement window would likely perform better in these large openings.

Another relatively low-cost restoration measure would involve stripping paint from the decorative terra cotta elements on these buildings. The dormitories are nearly unique within the March Field Historic District in that they include very large terra cotta details. These are found at the balconies on the side elevations and in the ends of the balconies on the facade. It is not known how these terra cotta surfaces were treated originally but there is reason to believe the terra cotta was glazed and unpainted. Trial removal of the paint from the terra cotta should reveal whether or not it was glazed. If so, careful removal of the many layers of paint should reveal a dramatic and handsome set of details, yielding great preservation values for very little cost.



7.1 Loggia Arches.



7.2 Northwest courtyard wing of Building 311, with contributing landscaping.



Building No.: 311 Historical Use: Barracks, Enlisted Personnel Date Constructed: 1929 Current Use: Dormitory, Enlisted Personnel

Area: 58,180 sq. ft.

2. Historical and Architectural Significance

Building 311 is one of two original barracks at March Field (the other is Building 400). With its twin, it is one of the largest and most elegant buildings within the historic district, rivalling buildings 100 and 323 in architectural sophistication. It is also a key structure from the functional standpoint, serving as one of the two original 300-man barracks for the enlisted men at March Field. Although modified by conversion from a barracks to a dormitory living arrangement, the building retains a high degree of integrity and should be regarded as a key contributing element of the district.

Building: 311

3. Building Description/Condition

Description: Building 311 is a dormitory building of about 60,000 sf. It is a two-story, board-formed, hollow-walled, reinforced concrete building with Mission-tile covered gabled roof forms, built in 1929. There are three essentially identical barracks at March AFB: this building and Building 400, both built in 1929, and Building 456, which was built in 1939. The huge C-shaped buildings, each built around an entrance courtyard, are the most distinctively Mission Revival buildings within the historic district. Being C-shaped, the barrack includes six major elevations (three facing the courtyard and three exterior elevations), as well as a smaller end-gable elevation at the terminus of each wing. The three courtyard elevations are dominated by a continuous twostory arcaded loggia, the most dominant element of the composition. The side and rear elevations include banks of paired rectangular window openings. The only arched opening outside the courtyard is a porch, centered on the rear elevation. This porch is one-story in Buildings 311 and 400. The roof for the barracks comprises long gabled forms, which extend the entire length of the rear, along each major wing, with small cross gabled elements at the courtyard side of each wing, i.e., at the termini of the two story loggia.

The loggia surrounds the courtyard on three sides. Arched openings at the first story are twice as wide as those on the second story, creating an interesting rhythm in which second story piers are alternately centered on the pier and the midpoint of the first story arches. The loggia is also the location for the most character-defining architectural details: terra cotta pilasters at the principal first-story entries; terra cotta surrounds for the second story balconies; and a decorative buttress form for the corners of the loggia. They are all painted over.

The heavy landscaping of the entrance courtyard contributes to the character of the building.

Each barracks has been modified, although from the outside the modifications appear slight when considered against the scale of the building. Interior spaces have been altered completely by partitioning of barracks-style sleeping quarters into small apartments. The partitioning was handled differently in Buildings 311 and 400, on the one hand, and Building 456 on the other. In 311 and 400, access to the apartments is gained through a series of entries on the exterior, each of which gives access to four apartments. This change in internal circulation resulted in exterior changes, specifically modification of windows to doors and vice-versa. The in-fill is generally denoted by concrete block construction, and because it is all behind the loggia, is difficult to discern. The other notable change was replacement of nearly all windows: the original steel casements have been replaced with double-hung bronze-anodized aluminum sash (Photograph 7.3).

The basements of all three barracks remain essentially unaltered, and are thus historically significant. The basement occurs only under the long rear element of the building, with crawl space under the remainder, accessible from the basement. Unique to Barracks 311 are a series of murals painted, we were told, during the WWII years, on the walls of the basement recreation room. While of unexceptional artistic merit, they are artifacts of importance to the building and the district.

General Condition: These buildings have been totally remodelled and refitted in the recent past, and remain in very good condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Two-story arcaded loggia * Mission-tile roof * Decorative terra cotta or cast stone at the two principal entrances * Entrance courtyard * Board-formed concrete walls * Wrought-iron railings * Copper gutters and downspouts * Exterior stairs	* Basement murals * Original stairways * Exposed concrete, hollow clay tile and brick basement walls * Original basement windows and doors

Non-Contributing Elements

Exterior	Interior
New sliding windows Laundry room windows which have the top half blocked	* Entire interior except for original stairways

Maintenance Considerations

At almost every elevation, damaged gutters, damaged or missing downspouts and/or missing diverters were noted. There is a particularly awkward situation where the downspout that lies on the central axis of the building empties on the central entry sidewalk.

Although few, some areas of the roof have missing or broken tiles, and at some locations the railings are damaged.

There should be ongoing efforts to maintain and enhance the plantings within the entrance courtyard. Its landscaping is an integral element of the character of this important historic resource.

The windows and screens are showing relatively early signs of fatigue. Some windows are skewed within their openings, screens are missing, some windows are cracked, while others are propped open with soda cans.

The areas along the rear of the building are good candidates for refuse disposal. Sumps are visible in some of these areas, and their ability to dispose of water should be verified. Many of the basement level doors and windows--among the few original elements of the building--are suffering from neglect. The steps down into the basement on the southwest and northeast sides, although protected by sheds, have potential for the collection of storm water and consequent flooding of the basement. Hatches, like that provided on the northeast side of Building 400, would effectively remedy this problem in a visually less intrusive fashion.

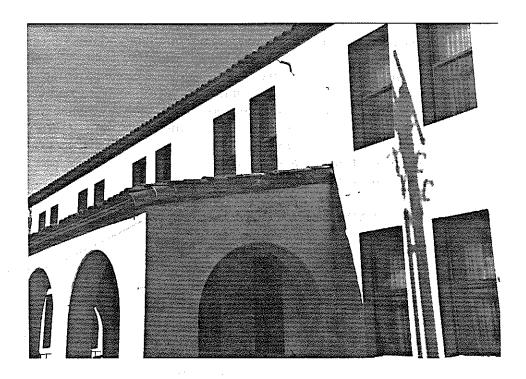
6. Possible Restoration/Enhancement Measures

The paint should be removed from the terra cotta ornamental work on the building, and repairs made to the surfaces and, if necessary, to the anchorages. Likewise, the careless overspray of paint onto the Mission tiles--especially at the entrance buttresses--should be removed.

The cost of replacing the original steel casement windows with double-glazed, double hung units complete with integral screens and storm sash, had to be extremely high. Yet they appear to not be holding up as well as one might expect. Unfortunately, heavy-handed treatment takes an even larger toll on casement windows. Fortunately, the dark anodized frames do not call attention to themselves, and this positive element should guide any future replacement programs.

Light colored replacement doors and transoms <u>do</u> call attention to themselves. Finishing these new elements in a darker, more recessive color, helps to properly blend them into the background.

Because of the problems inherent in their design and installation, the wrought iron railings merit frequent inspection, repair, and perhaps ultimate replacement. See General Discussion on this matter, elsewhere in this manual.



7.3 Double-hung aluminum replacement windows (Building 311).

Building No.: 400 Historical Use: Barracks, Enlisted Personnel Date Constructed: 1929 Current Use: Dormitory, Enlisted Personnel

Area: 58,180 sq. ft.

2. Historical and Architectural Significance

Building 400 is one of two original barracks at March Field (the other is Building 311). With its twin, it is one of the largest and most elegant buildings within the historic district, rivalling buildings 100 and 323 in architectural sophistication. It is also a key structure from the functional standpoint, serving as one of the two original 300-man barracks for the enlisted men at March Field. Although modified by conversion from a barracks to a dormitory living arrangement, the building retains a high degree of integrity and should be regarded as a key contributing element of the district.

Building: 400

3. Building Description/Condition

Description: Building 400 is a dormitory building of about 60,000 sf. It is a two-story, board-formed, hollow-walled, reinforced concrete building with Mission-tile covered gabled roof forms, built in 1929. There are three essentially identical barracks at March AFB: this building and Building 311, both built in 1929, and Building 456, which was built in 1939. The huge C-shaped buildings, each built around an entrance courtyard, are the most distinctively Mission Revival buildings within the historic district. Being C-shaped, the barrack includes six major elevations (three facing the courtyard and three exterior elevations), as well as a smaller end-gable elevation at the terminus of each wing. The three courtyard elevations are dominated by a continuous twostory arcaded loggia, the most dominant element of the composition. The side and rear elevations include banks of paired rectangular window openings. The only arched opening outside the courtyard is a porch, centered on the rear elevation. This porch is one-story in Buildings 311 and 400. The roof for the barrack comprises long gabled forms, which extend the entire length of the rear, along each major wing, with small cross gabled elements at the courtyard side of each wing, i.e.. at the termini of the two story loggia.

The loggia surrounds the courtyard on three sides. Arched openings at the first story are twice as wide as those on the second story, creating an interesting rhythm in which second story piers are alternately centered on the pier and the midpoint of the first story arches. The loggia is also the location for the most character-defining architectural details: terra cotta pilasters at the principal first-story entries; terra cotta surrounds for the second story balconies; and a decorative buttress form for the corners of the loggia. All are painted over.

There is a visible impression left within the arches of the upper loggia. It gives evidence of enclosure of the upper level, similar to the enclosure of the south end of Building 100's loggia. This probably occurred at the height of March Field's population, during WWII.

The terra cotta ornamentation has suffered some severe damage at this building; so much so that one small decorative balcony railing at the eastern terminus of the second story loggia has lost its anchorage, and the railing has been replaced with a makeshift substitution.

The basements of all three barracks remain essentially unaltered. There is a very effective, counter-weighted hatch to the basement stairs on the northeast side of this building (**Photograph 7.4**).

A great deal of vegetation was removed from the entry courtyard when the building was recently painted. This is a significant loss to the historic perception of Building 400.

General Condition: These buildings have been totally remodelled and refitted in the recent past, and remain in very good condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Two-story arcaded loggia * Mission-tile roof * Decorative terra cotta or cast stone at the two principal entrances * Entrance courtyard * Board-formed concrete walls * Wrought-iron railings * Copper gutters and downspouts * Exterior stairs	* Original stairways * Exposed concrete, hollow clay tile and brick basement walls * Original basement windows and doors

Non-Contributing Elements

Exterior	Interior
New aluminum windows Laundry room windows which have the top half blocked Replacement balcony railing at second story loggia eastern terminus	* Entire interior except for original stairways

5. Maintenance Considerations

At the southwest and northeast elevations, and particularly at the rear porch roof, damaged and disconnected gutters, damaged or missing downspouts and/or supporting straps were noted.

In many of the same areas, damaged, dislocated and missing tiles were noted.

At the rear porch, railings were rusted and some sections missing (Photograph 7.6).

A major effort should be launched to restore and enhance the entrance courtyard by new plantings. The courtyard's landscaping is an integral element of the character of this important historic resource (See landscaping at Building 311 as an example).

The windows and screens are showing relatively early signs of fatigue. Some windows are skewed within their openings, screens are missing, some windows are cracked, while others are propped open with soda cans.

The areas along the rear of the building are good candidates for refuse disposal. Sumps are visible in some of these areas, and their ability to dispose of water should be verified. Many of the basement level doors and windows--among the few original elements of the building--are suffering from neglect. The shabby wood shed protecting the basement steps on the southwest side should be replaced with a counterbalanced hatch like that existing on the northeast side.

6. Possible Restoration/Enhancement Measures

See paragraph on landscaping, above.

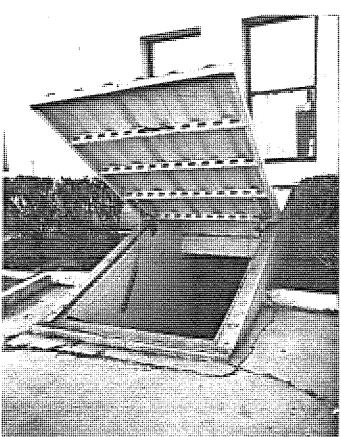
The paint should be removed from the terra cotta ornamental work on the building, and repairs made to the surfaces and, if necessary, to the anchorages (Photograph 7.6). Significant reconstructive work is needed at the second floor balcony at the Loggia's terminus. Perhaps this could be done with glass fiber reinforced concrete or with a similar substitute material. Whatever the solution, it is important to recapture the original appearance of this important feature of the building. In addition, the careless overspray of paint onto the Mission tilesespecially at the entrance buttresses—should be removed.

The cost of replacing the original steel casement windows with double-glazed, double hung units complete with integral screens and storm sash, had to be extremely high. Yet they appear to not be holding up as well as one might expect. Unfortunately, heavy-handed treatment takes an even larger toll on casement windows. Fortunately, the dark anodized frames do not call attention to themselves, and this positive element should guide any future replacement programs.

Light colored replacement doors and transoms <u>do</u> call attention to themselves. Finishing these new elements in a darker, more recessive color, helps to properly blend them into the background.

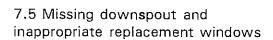
Because of the problems inherent in their design and installation, the wrought iron railings merit frequent inspection, repair, and perhaps ultimate replacement. See General Discussion on this matter, elsewhere in this manual.

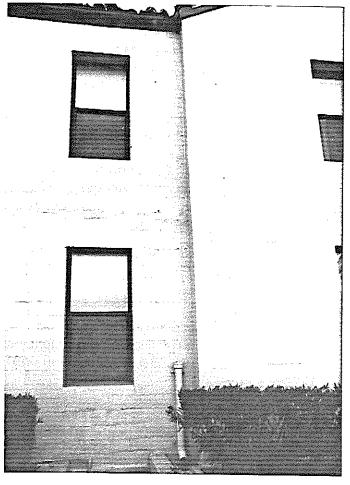
Selected Photograph of Building Detail

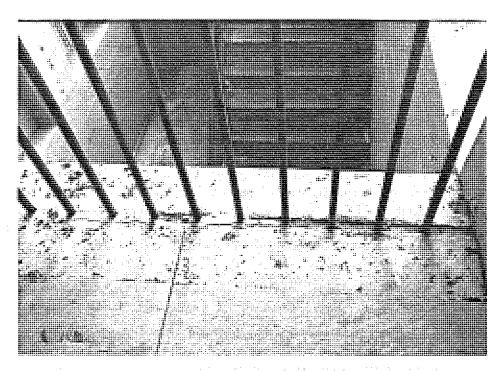


Barracks (Dormitories)

7.4 Hatch to basement at northeast side of building.







7.6 Rusted railings at rear porch.



7.7 Painted ornamental terra cotta tile.

Building No.: 456 Historical Use: Barracks, Enlisted Personnel Current Use: Dormitory, Enlisted Personnel

Area: 58,180 sq. ft.

2. Historical and Architectural Significance

Building 456 is a barracks built in 1939. Although built a decade after the original barracks (Buildings 311 and 400), it is essentially identical to them on its exterior elevations. It is one of the largest and most elegant buildings within the historic district, rivalling buildings 100, and 323 in architectural sophistication. It is also a key structure from the functional standpoint, serving as one of three 300 man barracks for the enlisted men at March Field. Although modified by conversion from a barracks to a dormitory apartment living arrangement, the building retains a high degree of integrity and should be regarded as a key contributing element of the district.

Building: 456

3. Building Description/Condition

Description: Building 456 is a dormitory building of about 60,000 sf., built in 1939. It is a two-story, board-formed, hollow-walled, reinforced concrete building with gabled roof forms, covered in Mission tiles. There are three essentially identical barracks at March AFB: this building, which was built in 1939, and Buildings 311 and 400, both built in 1929. The three huge Cshaped buildings, each built around an entrance courtyard, are the most distinctively Mission Revival buildings within the historic district. Being Cshaped, each barracks includes six major elevations (three facing the courtyard and three exterior elevations), as well as a smaller end-gable elevation at the terminus of each wing. The three courtyard elevations are dominated by a continuous two-story arcaded loggia, the most dominant element of the composition. The side and rear elevations include banks of paired rectangular window openings. The only arched opening outside the courtyard is a twostory (as opposed to one-story at the other barracks) porch, centered on the rear elevation. The roof for each barracks comprises long gabled forms, framed and sheathed in wood, which extend the entire length of the rear, along each major wing, with small cross gabled elements at the courtyard side of each wing, i.e., at the termini of the two story loggia.

The loggia surrounds the courtyard on three sides. Arched openings at the first story are twice as wide as those on the second story, creating an interesting rhythm in which second story piers are alternately centered on the pier and the midpoint of the first story arches. The loggia is also the location for the most character-defining architectural details: decorative pilasters at the principal first-story entries; decorative surrounds for the second story balconies; and a decorative buttress form for the corners of the loggia. The surrounds appear to be composed of cast stone at this barracks, while they appear to be composed of terra cotta at the two earlier buildings. All are painted over.

The ornamentation at Building 456 appears to be cast stone rather than terra cotta because, unlike at the earlier barracks buildings, it lacks the surface "striations" which were molded into the terra cotta to enhance the appearance of stone. This ornamentation has suffered damage over the years--it is especially severe at one of the loggia balconies--and should be cleaned of paint with a paint remover ideally consisting of a biodegradable gel and repaired. For major repairs, make a casting of an identical piece and replace the broken one. Smaller repairs can be made by using epoxy cement sculpted into the desired shape.

The basements of all three barracks remain essentially unaltered. Unlike the "board-forming" visible in the older barracks, plywood forms were used in this building, leaving their unique signature. Here also, are the only remaining original doors and windows. Areas and access stairs to the basement present the potential for flooding.

The entrance courtyard and its landscaping contribute heavily to the historic character of the building. A relatively new trellised barbecue gazebo is located in this courtyard.

General Condition: These buildings have been totally remodelled and refitted in the recent past, and remain in very good condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Two-story arcaded loggia * Mission-tile roof * Decorative terra cotta or cast stone at the two principal entrances * Entrance courtyard * Board-formed concrete walls * Wrought-iron railings * Copper gutters and downspouts * Exterior stairs	* Original stairways * Exposed concrete, hollow clay tile and brick basement walls, ceiling and structural framing * Original basement windows and doors

Non-Contributing Elements

Exterior	Interior
* New aluminum windows * Extremely large and noisy air conditioning equipment just to the left of the rear porch * Light-colored contemporary doors and transoms	* Entire interior except for original stairways .

5. Maintenance Considerations

As with nearly all the buildings, damaged and dislodged tiles and damaged gutters and downspouts need attention.

At the loggia and rear porch, railings show signs of deterioration (Photograph 7.8).

Efforts should be maintained to enhance the entrance courtyard with appropriate plantings. The courtyard's landscaping is an integral element of the character of this important historic resource.

The windows and screens are showing relatively early signs of fatigue. Some windows are skewed within their openings, screens are missing, some windows are cracked, while others are propped open with soda cans.

The areas along the rear of the building are good candidates for refuse disposal. Sumps are visible in some of these areas, and their ability to dispose of water should be verified. Many of the basement level doors and windows--among the few original elements of the building--are suffering from neglect. These are important features, and need protection.

6. Possible Restoration/Enhancement Measures

Because they are painted it is not possible to be certain that the ornamental work is fabricated of cast stone. But whether cast stone or terra cotta, the paint should be removed and repairs made to the surfaces and, if necessary, to the anchorages. Significant reconstructive work is needed at the second floor balcony at the Loggia's terminus. Perhaps this could be done with glass fiber reinforced concrete or with a similar substitute material. Whatever the solution, it is important to recapture the original appearance of this important feature of the building. In addition, the careless overspray of paint onto the Mission tiles-especially at the entrance buttresses--should be removed.

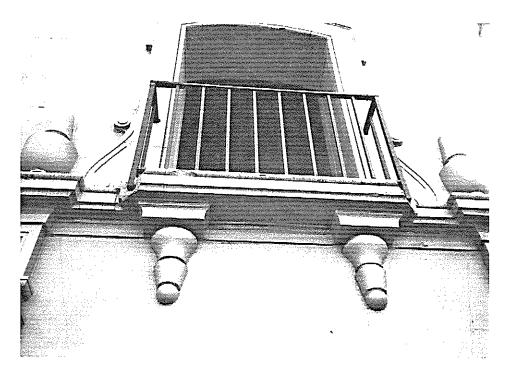
The cost of replacing the original steel casement windows with double-glazed, double hung units complete with integral screens and storm sash, had to be extremely high. Yet they appear to not be holding up as well as one might expect. Unfortunately, heavy-handed treatment takes an even larger toll on casement windows. Fortunately, the dark anodized frames do not call attention to themselves, and this positive element should guide any future replacement programs.

Particularly at Building 456, the light colored replacement doors and transoms inappropriately call attention to themselves. Finishing them in a darker, more recessive color, helps to properly blend these non-historic elements into the background.

Because of the problems inherent in their design and installation, the wrought iron railings merit frequent inspection, repair, and perhaps ultimate replacement. See General Discussion on this matter, elsewhere in this manual.

Selected Photograph of Building Detail

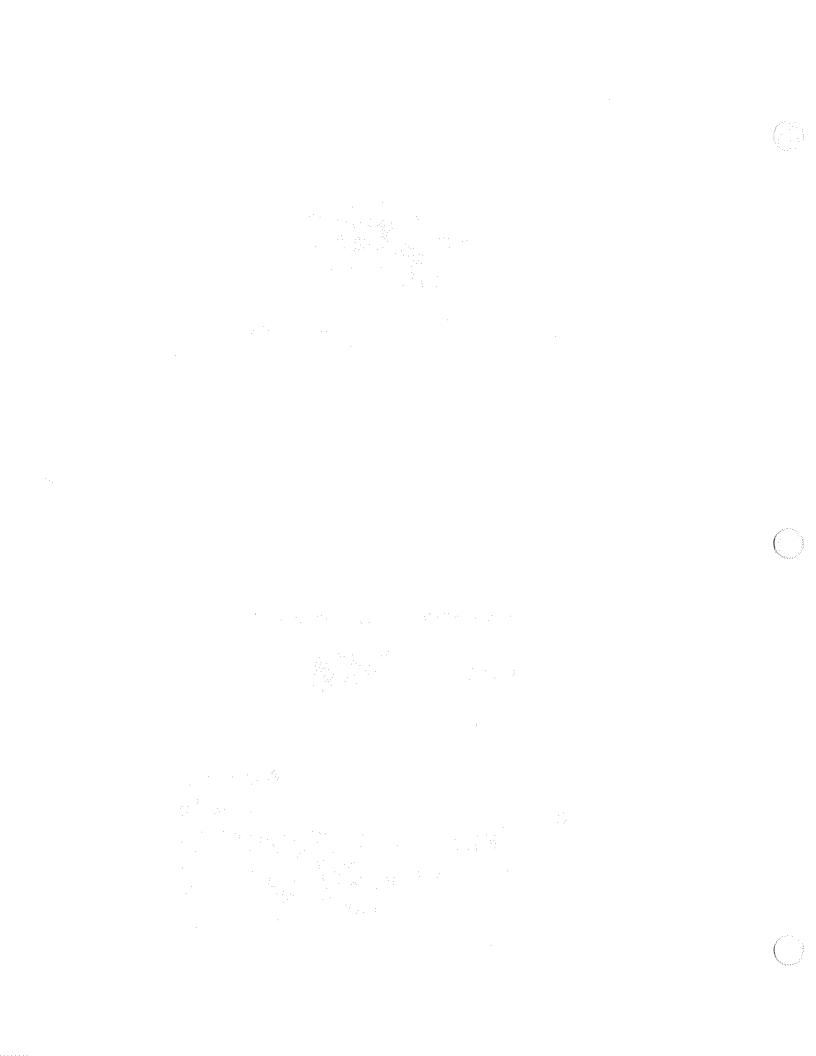
Barracks (Dormitories)



7.8 Deteriorating railing anchor at second story rear porch.



7.9 Replacement aluminum double-hung windows with missing screens



8. Warehouse (Quartermaster Corps) Buildings

Buildings Treated in this Section (Identified by Building Number):

420, 430, 435, 441

8.1 General comments on integrity, maintenance, and restorative measures for old Quartermaster buildings

The March Field Historic District includes four warehouse buildings which were constructed for storage, repair, and other activities by the Quartermaster Corps during the early years of March Field. These buildings are not repetitive building types in the same manner as the barracks, single family residences, or garages. Nonetheless, these buildings are quite similar and include some common attributes in terms of integrity loss as well as common maintenance problems and restoration potential.

The four buildings discussed in this chapter are modular industrial buildings with steel truss gambrel roofs supported on steel columns and plastered hollow clay block walls. Buildings 420, 430, and 441 include nearly identical modules, the buildings differing chiefly as to the number of modules: one for Building 430, three for Building 441, and four for Building 420. Each module is 69' wide. In Buildings 420 and 441, the modules are 101' long; in Building 430, the single module is 121' long. Building 435 is similar to the other buildings, including its steel truss roof system, hollow clay block walls, and general dimensions; it is 66' x 122'. The roof is gabled, however, and the parapet at the gable end is somewhat different than that found on the other buildings. Building 435 also includes very different interior arrangements, reflecting its unusual use as an ordnance warehouse (Photographs 8.1 through 8.4).

8.2 Contributing and Non-Contributing Elements

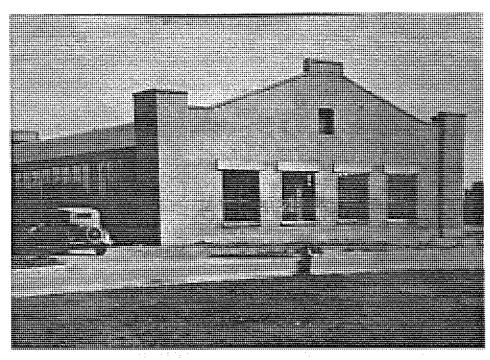
The four industrial buildings include similar lists of both contributing and non-contributing elements. Among the contributing elements are: large bands of industrial sash; the stuccoed hollow clay walls; steel doors; and original gutters and downspouts. Non-contributing elements include interior modifications and some blocked off windows. See individual forms for a further discussion of these.

8.3 Maintenance Considerations

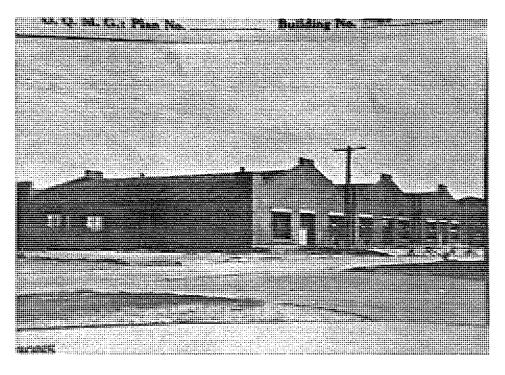
The four buildings appear to be in a generally good state of repair. Observed problems relate chiefly to the downspout and gutter systems. Building 441 also appears to have some problems with drainage beyond the building. See individual forms for a more detailed discussion.

8.4 Potential Restoration Projects

Restoration projects for these buildings are restricted to the potential for re-opening blocked off windows and doors. See individual forms for a more detailed discussion.



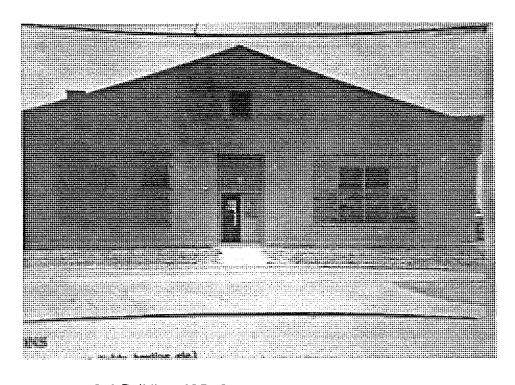
8.1 Building 430, Quartermaster Maintenance Building, 1931.



8.2 Building 441, Quartermaster Garage, 1931.



8.3 Building 430, Quartermaster warehouse, 1931.



8.4 Building 435, Ordnance warehouse, 1931.

Building No.: 420 Historical Use: Quartermaster Warehouse

Date Constructed: 1931 Current Use: Storage

Area: 27,700 sq. ft.

2. Historical and Architectural Significance

Building 420 is located in the historic Quartermaster Corps sector of the base. Quartermaster buildings were indispensable to the operation of the historic base. This building is unusual because of the construction of an impressive entry on the southeast side, not facing the street. The building was also steam heated, at least in part; and awnings were installed in 1932 to shade the windows, giving rise to the probability that office functions were a part of the building.

Building: 420

Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

3. Building Description/Condition

Description: Building 420 is a large, stuccoed hollow clay tile industrial building. It is comprised of a series of four gambrel-roofed modules, each 101' long and 69' wide. The roof is supported by steel trusses on steel columns, forming a very shallow gambrel, with only a subtle difference in pitch between the breaks at each side. At the front and rear, each roof is shielded behind a sloping parapet with concrete coping, rising to a rectangular crest at the apex. Concrete piers anchor the corners of each of the four bays, with a reveal, half the width of the piers, between adjoining bays.

The front and rear facade for each module included two large steel industrial sash windows and a wide door. These have been much altered over the years, and almost all the glass is painted over. The long side elevations include continuous steel industrial sash curtains with horizontal pivoting sash. Unique to the Quartermaster Corps sector is the very prominent and decorative entry door on the side of this building (Photograph 8.5). The rear of the building includes a loading dock with large roll-up doors. Although generally intact, Building 420 does include notable modifications to the original openings, including replacement of front doors with aluminum frame glass doors and modifications to the rear loading dock. The interior of the northwesternmost module appears to be intact, with the unaltered steel truss and wood roof sheathing system clearly exposed (Photograph 8.6).

Of special significance, there exists at the east corner of the building, an almost intact original restroom, complete with small hexagonal tiles on the floor, tile wainscot, and some original toilet partitions.

General Condition: Although essentially unchanged except for openings, the building's appearance is somewhat shabby. This is particularly true on the most prominent elevation, Graeber Street, where blocked out or painted-over doors

and windows, unpainted patches behind removed signs, missing rainwater systems and a deteriorating loading dock are all evident (**Photograph 8.7**). Deterioration is evident at the side wall facias and the painted trim.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
 * Plastered hollow clay block * Industrial sash windows * Decorative southeast entrance door, transom and surround * Parapet * Pilasters * Copper gutters and downspouts * Metal facias 	 * Original restroom: floor, wainscot and partitions * Original steel truss * Steel columns supporting truss * Original 1 x 6 wood roof sheathing * Original (or early) lighting fixtures

Non-Contributing Elements

Exterior	Interior
* Block-filled windows and doors * Painted-over windows	* Post-WWII partitions, doors, ceilings and fixtures

5. Maintenance Considerations

Immediately noticeable on the Graeber Street facade is the unpainted field behind the location of a removed sign, and the related missing rainwater collector and downspout. Unless the rainwater has been somehow diverted or a drain is installed inside the building, the potential for significant water collection and collateral damage is present.

Elsewhere around the building, many of the collectors, gutters and downspouts are damaged or missing; repair or replacement should be undertaken without delay.

The roofing material appears to be deteriorated; it should be carefully examined, and if necessary, repaired or replaced.

The facias on the side of the building have peeling, flaking paint and appear to be deteriorating. These too, should be repaired or replaced and repainted.

6. Possible Restoration/Enhancement Measures

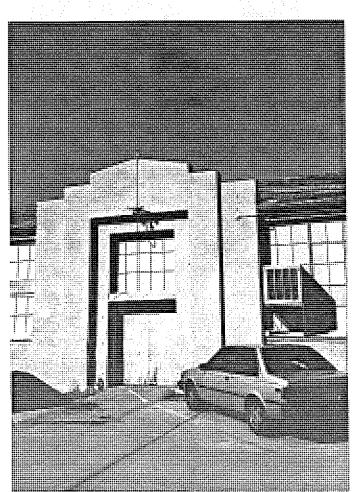
The blocked door and painted-over transom at the unique and handsome entrance composition at the building's southeast side should be reversed.

There have been alterations in the past which have provided man-doors within wide window openings. These alterations can be differentiated from the original man-doors in the same type of wide window openings, in two ways: at the sill, the sill's return to the door frame is articulated where the door cut is original, whereas the return is in the same plane as the cut-through wall where the doors were a later addition. Further, the original composition utilized metal doors and frames which were well integrated into the window-wall, whereas the later modifications utilized wooden doors, and were finished in a somewhat crude fashion. However, both circumstances occurred long ago. Future planning could reasonably either retain the man-door cuts in the window openings or, just as reasonably, modify the openings to accommodate a window only.

There is a need to undo, or at least to mitigate, the visual damage done by blocked doors and windows as well as painted-over windows. Until the ideal replacement of the blocked openings with restored windows and doors occurs, a darker shade of paint on these infill elements, as discussed elsewhere, permits the rhythms of the original openings to continue to be articulated.

The very high level of integrity of the interior of the northwesternmost bay makes it an extremely important historic resource. Future planning should respect this significance.

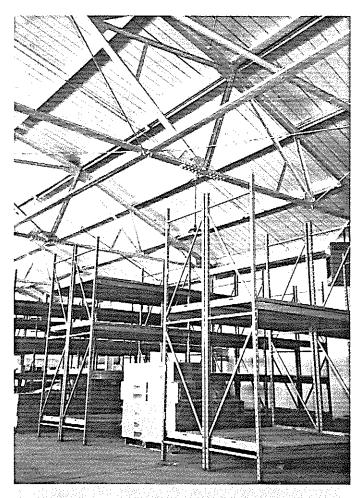
Selected Photograph of Building Detail



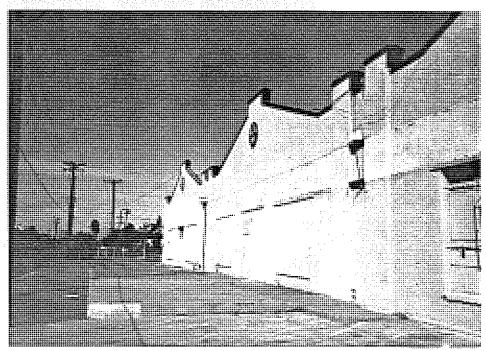
8.5 Decorative Entry.

Selected Photograph of Building Detail

Warehouse (Quartermaster Corps) Buildings



8.6 Original steel truss and wood roof sheathing (Building 420).



8.7 Blocked over doors and windows, Graeber Street facade (Building 420).

Building No.: 430 Historical Use: Quartermaster Maintenance Building

Date Constructed: 1931 Current Use: Storage

Area: 8,876 sq. ft.

2. Historical and Architectural Significance

Building 430 is located in the historic Quartermaster Corps sector of the base. These utilitarian buildings were indispensable to the operation of the base. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

Building: 430

3. Building Description/Condition

Description: Building 430 is a stuccoed hollow clay tile industrial building. Although somewhat longer, it is, in almost every other respect identical to any of the individual modules comprising Building 420. It is a gambrel-roofed building, 121' long and 69' wide. The roof is spanned by steel trusses supported on steel columns, forming a very shallow gambrel, with only a subtle difference in pitch between the breaks at each side. At the front and rear, the roof is concealed behind a sloping parapet with a concrete coping, which terminates in a rectangular crest at its apex. Pilasters, rising above the parapet, anchor the corners. The street facade consists of four original industrial steel windows under heavy, slightly protruding lintels. At the rear, there are two original windows, flanked by a roll-up door to the left and an infill panel with a metal door to the right. The long side elevations include original windows and some man-doors. Original terra cotta block exterior walls and interior partitions are still in place, as is the original plaster ceiling. The building is almost completely unmodified.

General Condition: Apart from some minor discrepancies noted below, the building, including the roof, appears to be in very good condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
 * Pilasters * Parapet * Industrial steel windows * Protruding lintels * Louvered attic vents 	* Hollow clay block walls and partitions * Steel columns supporting truss * Original plaster ceilings

Non-Contributing Elements

Exterior	Interior
* Immediately adjacent equipment	* Post WWII equipment and fixtures

5. Maintenance Considerations

The building appears to be generally well maintained. On the southeast side, there are two doors which are rusting and in deteriorating condition. On the northwest side, both the cast iron downspout extensions are missing.

6. Possible Restoration/Enhancement Measures

Future planning should make provision for the retention of the interior hollow clay tile and block partitions, as well as the plaster ceiling. In addition, the infill panel with the metal door at the rear of the building could be replaced to match the original, or otherwise more sensitively addressed.

Building No.: 435 Historical Use: Ordnance Warehouse

Date Constructed: 1931 Current Use: Thrift Shop Area: 3,724 sq. ft.

2. Historical and Architectural Significance

Building 435 is located in the historic Quartermaster Corps sector of the base. These utilitarian buildings were indispensable to the operation of the historic base. Although much like its neighbors in exterior appearance, this relatively small building has features unique to its original use. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

Building: 435

3. Building Description/Condition

Description: Building 435 is a moderately sized, steel truss spanned, stuccoed hollow clay block industrial building. It is 122' long and 66' wide. The gable ends at front and rear are finished with a simple, shallow parapet with concrete coping, rising to a peak at the ridge. Wide industrial sash windows, at the Graeber Street facade, flank what was formerly a double door entry with large transom above. Currently, there is a single door in a weathered plywood surround. Along the sides of the building, and similar to the front windows, wide industrial sash windows are centered on each bay with the exception of the second to last bay whose openings, on either side, go to the floor. This wide doorway is filled with an unusual and original metal rising door, which folds approximately in the middle, at just over 6', with glass panels above and a man-door set into the metal panels below (Photograph 8.9). Bars protect the windows, and a chimney, which once served a small forge, rises inside the northwest wall. The roof appears to be of corrugated metal with soldered connections, similar to the hangar roofs. Copper gutters and downspouts line the sides of the building.

Inside, the geometry of the fired hollow clay building material is evident: the "tiles" are 4" high rectangular "donuts", 8" wide and 12" long. They can be laid up as a single width wall either 8" wide or 12" wide. The building is divided roughly in half by a wall of this material, 12" thick, with a pair of heavy, steel-clad fire doors mounted on inclined rails, and designed to roll closed under gravity forces should a fusible link fail under rising temperature (Photograph 8.8). The front bays all have plaster ceilings, the second and third bays from the back of the building have a ceiling of plywood, and the rearmost bay has a gypsum board ceiling.

This building is almost completely unmodified and is a key element of the industrial sector of the historic district.

General Condition: The building appears to be basically original and in very good condition. The gypsum board ceiling is somewhat deteriorated; likewise,

to a lesser extent, the plywood ceiling. Both of these ceilings are not likely to be original, as is the plaster ceiling in front.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Pair of original, chain-operated, upward- acting, bi-fold equipment doors (unique and significant) * Industrial sash windows * Copper gutters and downspouts * Stuccoed hollow clay tile walls * Corrugated roof	* Exposed hollow clay tile walls and partitions * Fire-door * Plaster ceiling

Non-Contributing Elements

Exterior	Interior
* Altered central entrance door * On the southeast wall, although the original door remains in place inside, the opening at the exterior has been plastered over	* Plywood and gypsum board ceilings

5. Maintenance Considerations

At the southeast side, the plaster infill at the door location appears to have moved slightly outof-plane. This could be a potential leak problem. Additionally, the center downspout is smashed.

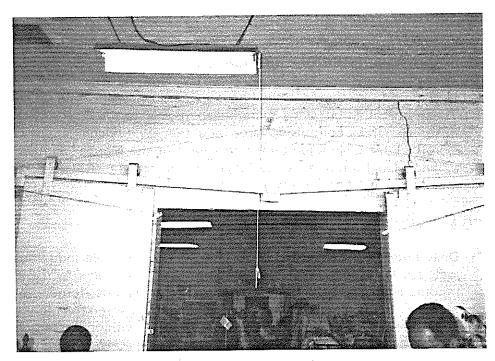
At the southwest side (front), the plywood around the entrance is delaminating.

At the northwest side, the center downspout needs a diverter.

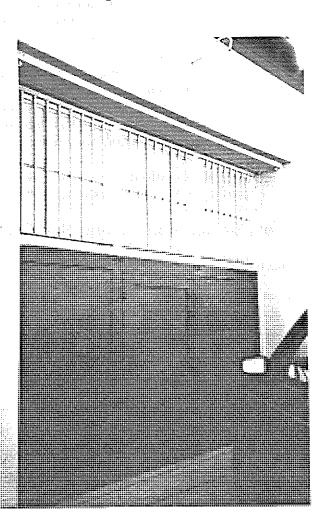
6. Possible Restoration/Enhancement Measures

The Quartermaster documents show the front entrance to be a pair of glazed wooden doors with a very large transom above. Priority should be given to replacing the existing doorway with a doorway in character with, if not matching, the original.

Hopefully, a future use of the building will find value in reclaiming the door now buried under the plaster infill, and reclaiming the open, structural character of the rear of the building by removal of the plywood and gypsum board from the underside of the steel trusses.



8.8 Fire Doors (Building 435).



8.9 Metal folding doors (Building 435).

Building No.: 441 Historical Use: Quartermaster Garage

Date Constructed: 1931 Current Use: Field Training Facility
Area: 21,000 sq. ft.

2. Historical and Architectural Significance

Building 441 is located in the historic Quartermaster Corps sector of the base. These utilitarian buildings were indispensable to the operation of the historic base. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic base.

Building: 441

3. Building Description/Condition

Description: Building 441 is a large hollow clay tile industrial building. It includes three gambrel-roofed modules, each 101' long and 69' wide. Each module is spanned by steel trusses on steel columns, forming a very shallow gambrel, with only a subtle difference in pitch between the breaks at each side. Each roof is shielded behind a sloping parapet with concrete coping, rising to a rectangular crest at the ridge. Pilasters, rising above the parapet, anchor the corners, with a reveal, half the size of the pilasters separating the individual modules. The Graeber Street facade for each module includes two wide steel industrial sash windows flanking what was originally a vehicle-sized door. The third and fourth opening from the left, which are essentially windows, have original central cut-outs to accommodate a single door (Photograph 8.12). This can be verified from the photograph on the Quartermaster documents. Continuous bands of steel industrial windows with horizontally pivoting operating sections line the side walls (Photograph 8.10). The rear is similar to the front, except that greater liberties have been taken making alterations to entrances and making entrances out of original windows (Photograph 8.11).

General Condition: The condition of the building appears to be fairly good, in spite of some minor distress as described below.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
* Parapets* Industrial steel window* Corner pilasters* Protruding lintels	* Exposed hollow clay tile * 14' high plaster ceilings	

Non-Contributing Elements

Exterior	Interior
* Alterations and infills at original openings	* Post-WWII partitions, fixtures, suspended ceilings

5. Maintenance Considerations

The presence of sandbags at the north corner of the building is evidence of drainage problems which need to be resolved. Along the same lines, two downspouts fail to properly reach grade, and there was a plugged storm-water inlet along the southeast elevation.

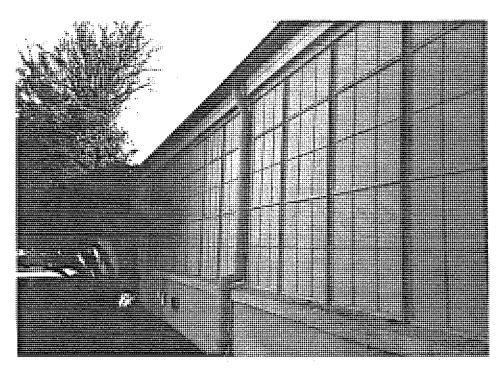
On the northwest elevation, there are stains at the facia and there is deteriorated paint and spalling plaster near the west end. Likewise, at the east corner of the northeast elevation, and at the south corner of the southwest elevation, there is deterioration and spalling plaster, most likely from water infiltration. Either the roofing and/or flashing has outlived its usefulness, or the roofing and/or flashing is defective at these locations. Immediate action is warranted if it has not already been remedied.

What appears to be an old settlement crack is apparent at the east corner of the building.

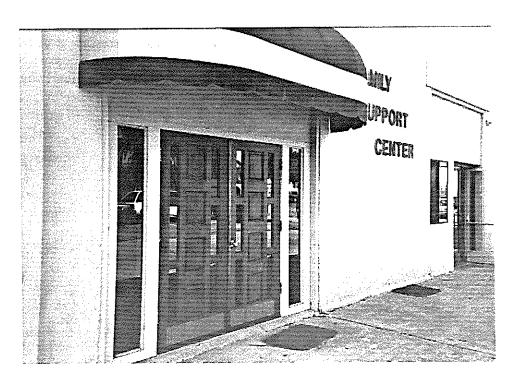
6. Possible Restoration/Enhancement Measures

Because this building has been converted into fairly intense office and educational use, the interior has been very significantly altered. Some of the early partitions, and much of the original high plaster ceilings remain. These remaining elements should be integrated into future use if at all feasible.

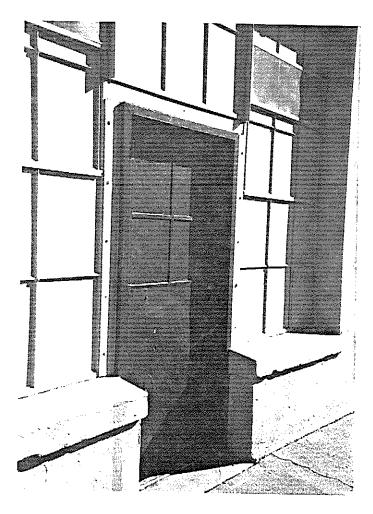
At the exterior, modifications to the openings should reflect the character of, or at least be sensitive to the character of the original openings. Steel industrial sash, fabricated to meet custom needs, is again manufactured in southern California.



8.10 Painted out industrial sash (Building 441).



8.11 Modifications to rear entry (Building 441).



8.12 Original window with center cut out for door (Building 441).



9. Non-Repetitive Buildings within March Field Historic District

Buildings Treated in this Section (Identified by Building Number):

100, 102, 108, 148, 154, 301, 315, 317, 323, 386, 405, 406, 407, 408, 409, 410, 411, 412, 413, 417, 418, 431, 432, 433, 439, 463, 465, 466, 467, 470, 472, 479, 488, 497

9.1. General Comments on Integrity, Maintenance, and Restorative Measures for Non-Repetitive Buildings

In Sections 3 through 8, the buildings at the March Field Historic District were analyzed according to repetitive building types, buildings which are structurally identical or so similar as to warrant treatment in groups. This section deals with 34 buildings and structures which do not fall into such repetitive buildings types.

These 34 buildings and structures exhibit such as wide range of structural materials and systems that no general comments may be made which apply to all or even to a substantial proportion of them. For maintenance and restoration proposals, the reader is referred to the individual building reports.

It will be observed that comments are minimal in the treatment of six structures: the four concrete water tanks, the metal water tank and tower, and the flagpole. These structures are very specialized in use and should be inspected by structural engineers. Restoration proposals are similarly minimal with respect to the utilitarian units.

Building No.: 100 Historical Use: Bachelor Officers Quarters
Date Constructed: 1929 Current Use: Visiting Officers Quarters

Area: 24,865 sq. ft.

2. Historical and Architectural Significance

Building 100, the original Bachelor Officers Quarters at March Field, is a key contributing element of this historic district. It is arguably the most elegant building within the base, epitomizing the intended Mission Revival design. Although altered, it is an indispensable element of the district.

Building: 100

3. Building Description/Condition

Description: Building 100 is one of the most elegant buildings on the base. With four one-story segments completely surrounding a patio area, the building forms a hollow rectangle, each segment accessible to the outside and to an inner garden-patio (Figure 2). While of some architectural interest from the outside, the building's character is best seen from the patio, where a four-sided, arcaded *corredor* (corridor) surrounds the patio. The building appears to be small-scale because little of it can be seen at a time, but it was actually the largest building at March Field at the time it was constructed, covering an area of nearly 40,000 sq. ft. (That number is somewhat deceptive in that it includes the patio area as usable space.) The scale is best appreciated from the patio, where all segments of the building are visible. It measures 225' (north-south) by 174'. It is built of hollow-wall concrete construction with a wood framed and wood sheathed roof covered with Mission tiles.

The building comprises four hipped roofed segments, with the hipped roof extending toward the patio, forming the roof for the *corredor*. The exception to this roof pattern is found at the west elevation, which features a taller, gabled pavilion over the original principal public rooms. Entry to the patio is gained from five points: through two arched portals on both the north and south elevations, which align with the east and west sides of the *corredor*; and from an arched portal midpoint on the east elevation, on axis with Adams Avenue (Photograph 9.1). Entry from the exterior was limited to three doorways in the gabled pavilion on the west elevation (Photograph 9.2). All other rooms in Building 100 except for the original kitchen are accessible only from the patio.

In addition to its unique hacienda style, Building 100 is distinguished among March Field buildings in its architectural detail. The most richly ornamented area was the western pavilion, which is among the most heavily altered parts of the building. Entry was initially gained through three arched doorway openings. Originally, these were double French doors with a fanlight transom, sidelights and arched band around the transom. [This doorway is strikingly similar to doors found throughout the Marine Corps Recruit Depot in San Diego, a Marine base designed by Bertram Goodhue, 1918-19.] These arched openings align with three rectangular doorways on the *corredor* side. Only one arched opening is still in place, the northerly of the three. The other archways have been infilled and include modern window openings (**Photographs 9.3** & **9.4**). Handsome fireplaces (at least one of which is still operable) decorated both the original lounge and the library, and shared the same chimney at the south side of the western pavilion.

The arched portal on the east elevation is framed by a characteristically Mission Revival parapet with a curvilinear motif (sometimes called an *espedana*). This curvilinear motif is repeated in the curbing surrounding a fountain at the center of the patio, an original feature of the 1929 building. Evidence within the arches and on the *corredor* floor shows that the south side of the *corredor* was once filled in -- probably in the same manner in which the upper balconies of the three barracks were enclosed.

Building 100 retains a high degree of integrity when viewed from the exterior or from the patio. There are significant modifications, however, to the interiors. The three wings containing individual accommodations, each of which comprises a suite of sitting room, bedroom and bathroom, have entirely lost their original character (Photograph 9.5). The western pavilion originally housed the dining room and lounge; two spaces, identical in design, that could be joined by opening wide interconnecting doors. The lounge section is now lost to a series of low-ceilinged offices, while the dining room space has been converted into a lounge/registration lobby retaining the full-height ceilings, and retaining (in slightly modified form) one of the fan-lighted doors. These modifications have obscured or destroyed important character-defining elements, including the MCRD-type doors as well as decorative interior partitions. What appears to be the last original wood door frame can be found at the south side of the original library which is the first room south of the raised western pavilion.

Another notable alteration was construction of a wrought iron canopy which shelters the entry to the western portal on the north elevation, making this effectively the primary entrance to the building. This modification, installed in 1977, is visually obtrusive but reversible (Photograph 9.6). Nearly all of the original brass electroliers have been removed and nearly all the French doors that lined the *corredor* have been replaced by solid doors with sidelights. While these modifications affect the decorative aspects of this building, the integrity of design, feeling and association for this structure are largely intact, owing to the dominant role of the *corredor* encircled patio, which is so large in scale that it disguises many of these alterations. The building remains a key contributing element of this historic district.

General Condition: Like all the occupied buildings in the historic district, Building 100 is essentially well-maintained. But like the other buildings, there are a few dislodged, broken and/or missing roof tiles. Again like the other buildings, some of the rain gutters and downspouts are bent or broken. Most notably, the entire gutter system at the south end of the patio is encased by vines. Around the perimeter of the building a number of windows have painted infill panels rather than glass in locations where air conditioners were once installed (Photograph 9.7). Underfloor access is neglected in some locations. Lighting fixtures around the perimeter, with the exception of the west entrance, are utilitarian and/or inappropriate.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Hollow wall concrete construction * Rough form board exterior surface * Mission tile roof * "Show Rafters" at the building's eaves * Concrete chimney * Mission Revival portal at east entry * Round-arched portals, north and south walls * Copper gutters and downspouts * Heavy concrete splash blocks * French doors * Arcaded corredor around patio * Corredor sloped beamed ceiling * Corredor paving * Patio paving and curbing * Patio fountain composition	 * Fireplace(s) * Reception Lobby wood truss (and any others which may be concealed) * Reception Lobby decorative wall panels * Original hardwood flooring * Original hexagonal tile floor and tile wainscot with glazed ceramic cap moulding at service closet adjoining original library.

Non-Contributing Elements

Exterior	Interior
* Aluminum-framed casement windows * Non-original exterior lighting fixtures * Overhead festoon of cable bundles at west corredor * Replacement doors or infill windows where French doors originally existed * Replacement doors at guest suites * North entry canopy, ramp and planter boxes	* Lowered ceilings * Prefabricated wall coverings * Carpeting * Nonhistoric partitions, doors, trim * Lighting fixtures * Plumbing fixtures

5. Maintenance Considerations

South Gable of the west pavilion at the lower roof line: the paint-covered flashing appears to be pulling away from the wall, generating an imminent leakage potential. Immediate remedial action is needed.

Along the north and east side of the exterior: a number of the concrete splash blocks are leaning inward, capturing rather than dispelling rainwater.

West wall, north wing: at two locations, diverters are missing from the base of the downspouts.

South side: the crawl space access is unscreened, permitting varmint intrusion.

Patio, northeast corner: the copper gutter is bent and broken.

Patio, east side, 4th bay from the south end: the copper gutter is bent.

Patio, south side: vines completely encase the copper gutter. Although the gutter's ability to function is impaired, the condition does not seem to be generating any collateral damage. Would recommend no action until there is a marked potential for damage, at which time the vines should be removed.

Attic vents, west *corredor*, west wall: These vents have become the entry ports for bundles of electrical and communication cables. This condition has dislodged the screens, permitting entry of insects, birds and animals (**Photograph 9.8**). A much better solution for these cables would be a simple cable tray or gutter along this wall between the two separated attic spaces, with discreet and hidden entry ports at each end.

6. Possible Restoration/Enhancement Measures

Recognizing the importance of this building to the historic district, every repair and upgrade effort should always look at the long-term restoration potential, and implement activities which coincide with these restoration goals.

Currently, nothing does a greater disservice to this handsome building than the existing haphazard <u>exterior lighting fixtures</u>, many of them already in a deteriorated condition. Although the initial cost for a casting would be high, the pair of existing fixtures at the west doors of the building are original, and could be reproduced for use throughout this and other buildings in the district where this scale of fixture is appropriate. Over the lifetime of the building, the cost of permanent and historically accurate fixtures is by no means excessive.

When the useful life of the aluminum casement <u>windows</u> has ended, they should be replaced with windows that match the color and geometry of the originals. Original documentation shows wooden casements with muntins dividing each panel into several lights. These windows types were standard for buildings constructed in 1929. Replacement windows that would match the originals are now available from a number of manufacturers in a number of materials and combinations.

The future role of buildings in this historic district may once again find need for food service and/or community meeting functions at this structure. The restoration or rehabilitation of the <u>interior of the western pavilion</u> to this function could reclaim for history one of March Field's major social spaces and bring new life to the beautiful adjacent patio.

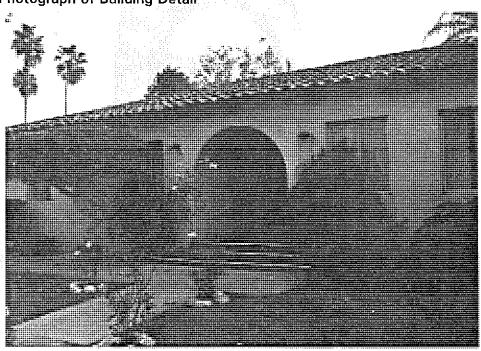
Associated with the above would be the restoration of the original <u>fan-light transomed</u> <u>French doors</u> at the western pavilion, a project which would reverse major exterior alterations. (The Marine Corps recruit Depot, San Diego, has recently replaced dozens of such doors with replacements that would be very appropriate to Building 100.)

Restoration to the *corredor* of its original encircling rhythm of $\underline{\text{French doors}}$ would return the patio to its original appearance.

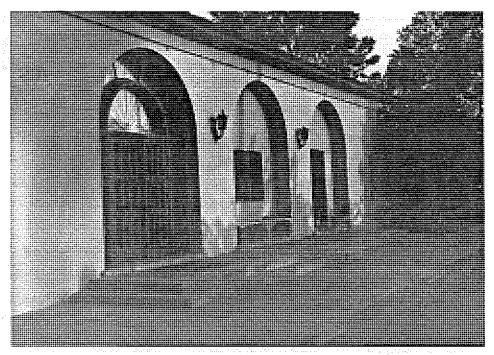
As floor coverings wear out, upgrading work should endeavor to reclaim the still extant <u>hardwood floors</u>.

As wear and obsolescence take their toll, remodelling work should be sensitive to the <u>original materials</u>, finishes and <u>details</u>, recapturing them, at least in spirit, and, ideally, reproducing them from documentation where possible.

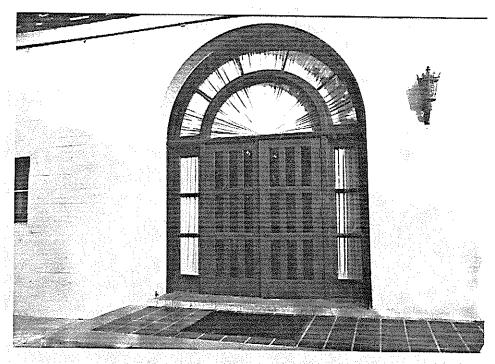
Selected Photograph of Building Detail



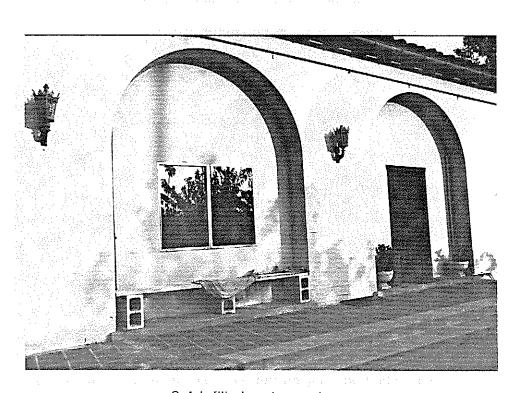
9.1 One of the arched portals providing access to the corredor.



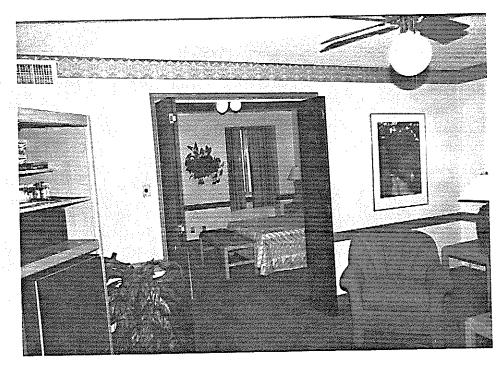
9.2 Three arched opening on the west elevation originally provided access to the public space within the building.



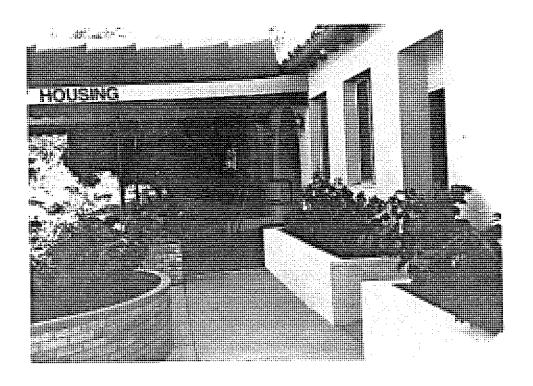
9.3 Last remaining fanlight door, a sympathetic replacement.



9.4 Infilled arch openings.



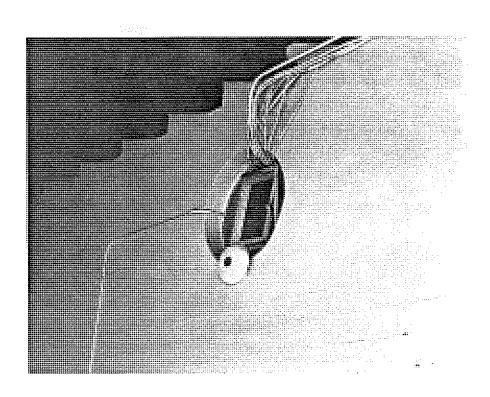
9.5 Remodeled Visitor's Quarters.



9.6 Inappropriate modifications at northwest portal.



9.7 Replacement and blocked-out windows.



9.8 Electrical wiring in attic vents.

Building No.: 102 Historical Use: Storage and Apartment Date Constructed: 1932 Current Use: Distinguished Visitors Quarters

Building: 102

Area: 1,840 sq. ft.

2. Historical and Architectural Significance

Building 102 is a contributing part of the March Field Historic District. The Pre-1941 Quartermaster Corps building files refer to it as "Garages & Storerooms", noting 27 such units. Building 100 was constructed with 26 guest suites. It is likely, given its location between the Officers Club and the Officers Quarters, that it was a garage and storage facility for the officers quartered in Building 100. It is equally plausible that the upstairs apartment provided both overnight security and a 24-hour service function to the Officers Quarters by the individual or couple living therein. The garage/storage units have been demolished, but the evidence, from scuppers through the walls and pieces of flashing and roofing paper still embedded in the walls and painted over, is that these units lined the north and south walls of the enclosure. Seventeen such 10-ft units could line up across the north, and five each on the east and west sides of the south wall, leaving room for the two-story structure flanked by 12-ft gates on either side. Recognizing that not only the married officers, but also the married NCOs and Barracks 311 had garages or carports, a parallel use for building 102 is very plausible. It was adapted for its current use in 1954. Although changed from a functional standpoint, the building, together with its high walled courtyard, retains a high degree of integrity.

3. Building Description/Condition

Description: Building 102 includes two elements: a two story hollow clay tile building and a tall hollow clay tile wall which surrounds the building (Photograph 9.9). The building measures 20' x 46', is finished in stucco and includes a hipped roof covered in Mission tile. An arched opening in the center front of the building gives access to an entry vestibule containing a stairway to the second floor and entrance doors to the quarters on each level. The second floor vestibule opens to the south by means of a wide balcony centered on the entrance below, and containing a very simple wrought iron railing that matches the stair rail. The wall, also finished in a smooth stucco, measures 70' x 170'. Despite its change in use, the building retains a good degree of integrity. The most notable intrusive elements are the windows, which are now sliding aluminum sash throughout, with an awkward plastered transom infill above. The original fenestration is not known but is presumed to have been steel casement windows, similar to those found in most buildings throughout the district. The canopy at the entrance and the "balloon" awning at the balcony, although not contributors, are reversible and do not in any way degrade the historic composition (Photograph 9.10).

General Condition: The condition of the building appears to be excellent, among the best maintained in the district. Not even minor problems with roof tiles and gutters were evident. However, the survey team was not permitted access to the interior, so there is no way to determine either its integrity or its condition. The exterior plaster over the hollow clay tile extends on the interior of the courtyard only over what were originally exposed surfaces. The garage/storage units were not plastered inside; consequently those painted but exposed hollow clay tile surfaces serve as ghosts of the original structures.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Show Rafters * Copper gutters and downspouts * Heavy concrete splash blocks * Arched opening to vestibule * Vestibule and stairway * Second floor opening and balcony * Stairway and balcony railings * High walled enclosure	* Unable to determine due to lack of access

Non-Contributing Elements

Exterior	Interior
* Aluminum replacement windows, which do not fill the entire original wall opening, with an awkward band of plaster above each window, in the plane of the glass * Removal of garage units	* Unable to determine due to lack of access

5. Maintenance Considerations

Although no weakness were noticed, like the other buildings in the district, the rainwater removal capabilities must be monitored. This translates to care for the roof, gutters and downspouts, and efforts to prevent or mitigate problems resulting from plantings established in close proximity to the walls.

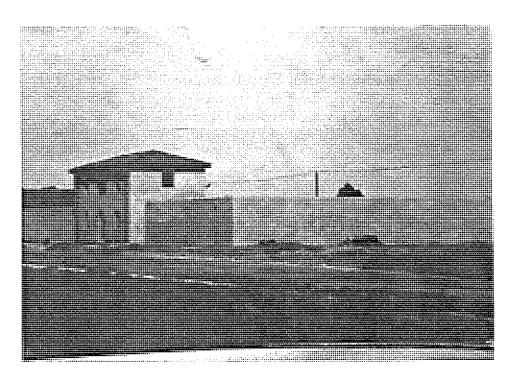
6. Possible Restoration/Enhancement Measures

Because of the survey teams inability to secure access to the interior, no comments are possible with regard to restoration/enhancement measures possible within.

At the exterior, the single priority is the restoration of the $\underline{\text{windows}}$ to their original appearance.

Building: 102

Selected Photograph of Building Detail



9.9 General view of Building 102, 1932.



9.10 Facade, showing awning and aluminum sash.

Building No.: 108 Historical Use: Well House Date Constructed: 1934 Current Use: Storage

Building: 108

Area: 196 sq. ft.

2. Historical and Architectural Significance

Building 108, historically a well house for the officers' quarters sector, contributes to this historic district, being one of the least modified utilitarian buildings in the historic district.

3. Building Description/Condition

Description: Building 108 is a small reinforced concrete pump house, located within the officers' quarters sector. It measures 14' x 14', features a tiled hipped roof and is almost completely unmodified, inside as well as outside (**Photograph 9.11**).

General Condition: Building 108 is in a deteriorated state; see Maintenance Considerations.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
 * Mission-tile roof * Rafter tails * Original steel sash * Original entry door * Board-formed concrete walls * Stepped water-table base at perimeter of building * Recessed identification (Water Well No.4) 	* Roof framing and sheathing * Original equipment, including transformer, well head, switches and fuse box.

Non-Contributing Elements

Exterior	Interior
* Weather/security cover over window in door	*

5. Maintenance Considerations

It is a recognized and understandable axiom that many of the buildings with the greatest architectural integrity are frequently those buildings which have been unused, bypassed or neglected. While this building is far from being derelict, its condition is clearly run down.

This building's lack of maintenance has an "upside". It is easier within and on this building to count back generations and colors of past paint jobs over the years. Also, original wood doors and original windows are a rarity, and their preservation is now very important. All of the following are overdue attention:

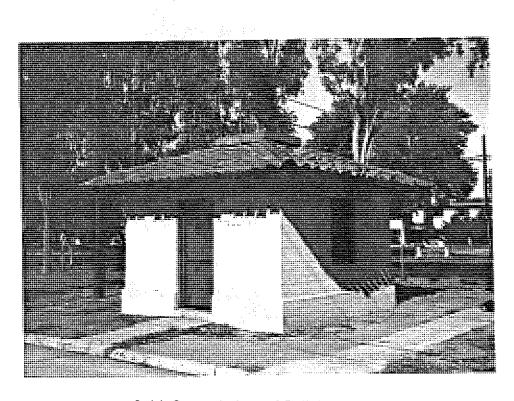
- * Damaged ridge rafter-tail
- * Rusting of window sash and blistering of paint
- * Replacement of missing roofing tile
- * Deteriorated and peeling paint on wood surfaces

6. Possible Restoration/Enhancement Measures

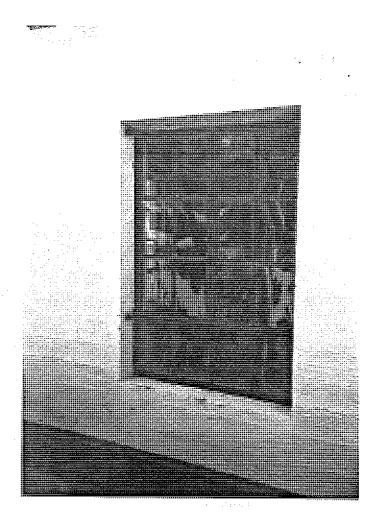
A small but conscientious repair/caulk/repaint project can restore this small building to its original condition and appearance.

Selected Photograph of Building Detail

Building 108



9.11 General view of Building 108.



9.12 Original steel casement windows.

Building No.: 148 Historical Use: Radio Hut Current Use: Vacant

Building: 148

Date Constructed: 1929 Area: 634 sq. ft.

2. Historical and Architectural Significance

Building 148 is a prominently sited building, located just behind the main gate house, and is one of the most interesting buildings within the historic district. It contributes strongly to the district on historical as well as architectural grounds.

3. Building Description/Condition

Description: Building 148 is the original "radio hut," now unoccupied, located just behind the main gate along Baucom Avenue. It is a hollow wall concrete building with a tiled roof, measuring 16' x 25' with 4' x 8' tile-roofed wings at either side (Photograph 9.13). It is a somewhat whimsical building, with a rusticated concrete door surround at the facade, surmounted by the Art Deco bas-relief likeness of a vintage aircraft engine and propeller. Further enriching the composition are the structure's small wings, delicately buttressed and surmounted with an Art Deco/Mayan interpretation of the mission revival espadana. Windows in these wings are concealed behind a diagonal latticework that was cast-in-place with the building. The remaining windows are protected by an iron grillework set out from the wall. Behind this grillwork are double hung screens over the original wood casement windows (Photograph 9.13 & 9.14). Within the building are original interior doors. The building was originally flanked by a pair of radio towers, about 50 to 75-ft to the right and left. The building is almost completely unmodified.

General Condition: With the exception of some problems at the roof and gutter, the building appears secure and in very good condition for being unused (Photograph 9.15).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board-formed concrete walls	* Unable to determine because of access
* Entry door	problems
* Mission-tile roof	
* Rafter tails (or "show rafters")	
* Copper gutters and downspouts	
* Heavy concrete splash blocks	
* Entry door ornamentation	Table 1
* Buttresses with top ornamentation at	
building wings	
* Cast-in-place latticework	the particular to the second of the second o
* Security grilles	
* Double-hung screens	
* Original wood casement windows	
* Round vents or ports high on southeast	
wall	
* Half-round stoop at southwest service	
door see the see the	

Non-Contributing Elements

None apparent, except that the tile roof has been painted red.

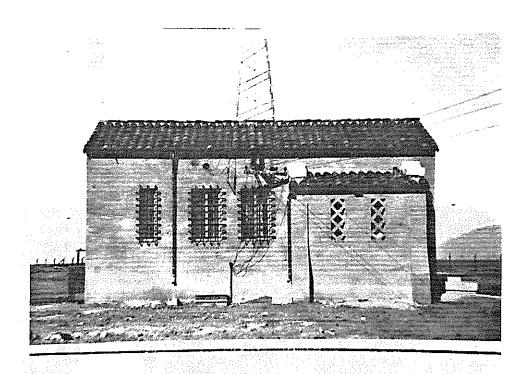
5. Maintenance Considerations

Like most buildings within the historic district, the problems relate to rainwater removal:

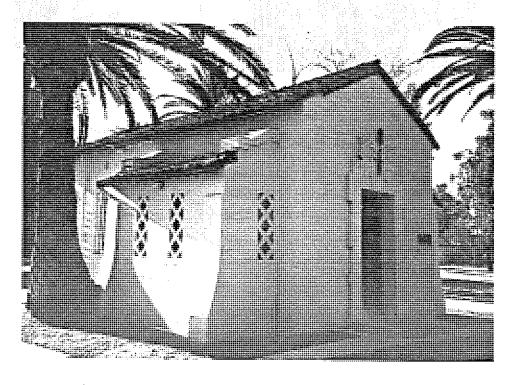
- * Some loose and missing tiles at the roof
- * Badly crushed gutter, southeast side
- * No diverters at base of downspouts, northwest and southeast sides

6. Possible Restoration/Enhancement Measures

It is important that a use be found for this most significant small building because maintenance is closely correlated with use. The building is in remarkably original condition, indicating that any restoration work would be neither difficult nor costly. Although small, the building could accommodate a ceremonial use such as a tiny memorial chapel to the memory of all those who served at March Field in the uniform of the Army Air Corps and the US Air Force.



9.13 General view of northwest elevation, 1929.



9.14 View of facade and southeast elevation, 1993.



9.15 View of missing tiles and crushed gutter.

Building No.: 154

Date Constructed: 1932

Historical Use: Gate House

Current Use: Vacant

Building: 154

Area: 120 sq. ft.

2. Historical and Architectural Significance

Building 154 is an important visual and ceremonial element of the historic district, having served as the primary gate into the base. Although now unused, the gate and gate house are the first glimpse of the historic district for most visitors and for that reason are indispensable.

3. Building Description/Condition

Description: Building 154 is the original gate and gate house, located at the original Main Gate at the corner of Riverside and Meyer. The gate house itself measures about 11' x 11', and is built of board-formed reinforced concrete walls with a gabled roof covered with Mission tiles. An 11' length of concrete wall, 6' in height, extends to either side of the gate house, terminating in a concrete post to support the steel gates (**Photographs 9.16 and 9.19**). Complementary walls exist at the opposite ends of the gates. The gate house, concrete walls, and gates retain very high degrees of integrity. The original frosted globe lamps on top of the concrete posts have been replaced with lantern-type fixtures (**Photographs 9.17 and 9.18**).

General Condition: Although the structure remains sound, its lack of use is making it a victim of neglect. The painted walls are peeling, and cracks and spalls in the concrete walls are exposing rusting reinforcing steel. Rust is also evident on the gates. The window glass is painted, and the wood door and frame are very badly deteriorated (Photograph 9.19).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board-formed concrete walls * Mission-tile roof * Decorative rafter-tails * Stepped water-table base at building wall * Original steel casement windows * Security bars on windows * Concrete wall and gateposts * Steel gates	* None

Non-Contributing Elements

Exterior	Interior
* Light fixtures are modern	* None

5. Maintenance Considerations

Although the roof appears to be in good shape, all other exterior materials and finishes need attention.

The rusted reinforcing steel should be thoroughly cleaned, primed and sealed in epoxycement grout, and the concrete repaired and repainted.

The rusting at the gate should be arrested by a careful cleaning, priming and repainting.

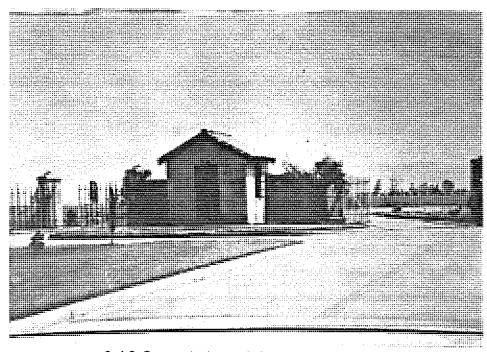
The entry door and frame are heavily deteriorated and should be repaired if possible.

If beyond repair, they should be replaced to match the original in appearance and color.

6. Possible Restoration/Enhancement Measures

Because everything at the Gate House appears to be original, repair and repainting will return this neglected design element to its proper position of importance within the historic district. The two possible exceptions to originality are the gate house door and the gates themselves. A review of vintage photographs or drawings is warranted to guide replacement of these and all other items if and when appropriate.

Selected Photograph of Building Detail

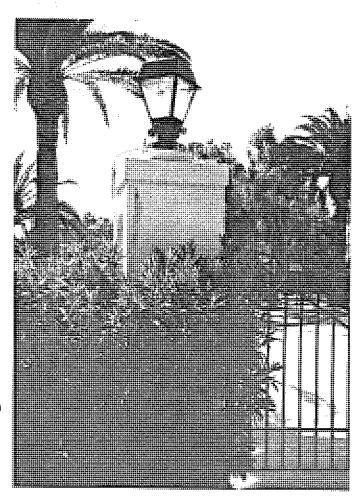


9.16 General view of Gate House, 1932.

Selected Photographs of Building Detail

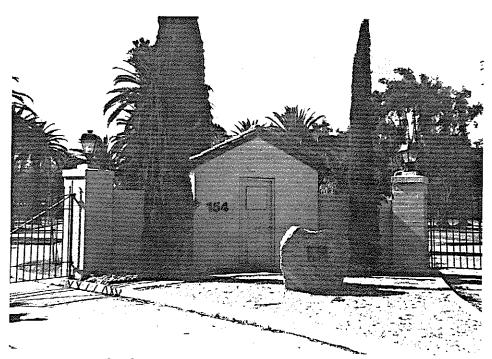


9.17 View showing original double-hung four-light wooden windows and original light fixtures.



9.18 Close-up of modern lamp with exterior mounted electric conduit.

Building: 154



9.19 General view of Gate House, 1993.

Building No.: 301 Historical Use: Firehouse and Guard House

Building: 301

Date Constructed: 1932 Current Use: Security Police

Area: 6,966 sq. ft.

2. Historical and Architectural Significance

Building 301 is a unique building within the March Field Historic District. Although a utilitarian building, it is prominently sited at the edge of the Parade Ground and near the Headquarters Building. Probably in recognition of its prominent position, its designers were careful to integrate it into the general Mission Revival theme of the base. It is an important and largely unmodified part of the historic district.

3. Building Description/Condition

Description: Building 301 is a 6,966 sf building, originally built as a combined firehouse and guard house. It is sited at a 45 degree angle from the corner of Baucom and Graeber. Built of hollow clay tile with a stucco finish, the front section is a twostory building with a hipped Mission-tile roof (Photograph 9.20). A fairly generous overhang is supported by decoratively shaped rafter tails. It was used as the original firehouse and featured large apparatus doors at the facade (both of which have been in-filled), with office, sleeping and/or training space at the second story. Original steel casement windows are in place at the side elevations and on all four sides of the second story (Photograph 9.21). The main entrance door is on the north side, with a secondary entrance on the south, now serving the exercise yard. The apparatus doors are articulated with what appears to be a cast stone frame and cornice. The main and south doors are surrounded with a double frame in shallow relief, and the first floor windows are surrounded with a shallow relief frame with a molded sill. The main (north) doors appear to be original, and are exceptional; a pair of wood doors, with vertical wood plank sheathing, complete with decorative 6-light view windows, and a wood 18-light transom overhead (Photograph 9.22). The north side of this front section has accumulated numerous non-contributing elements such as a steel stairway, a cantilevered steel framework for evaporative cooling equipment, window air conditioners, piping, conduit and wiring (Photograph 9.23).

Attached at the rear is the one-story guardhouse; also (according to the Quartermaster documents) constructed of stuccoed hollow clay tile. However brick is evident on the interior, and given the brittleness of hollow clay tile, brick could very likely form the inner shell or possibly the entire thickness of the walls of this detention facility. Steel trusses covered with straight wood sheathing form the gabled roof which is covered with Mission-tile. Still in use for detention, it is noteworthy for its essentially unaltered interior and for its unique original steel windows which combine security and operability in a handsome composition which, at first glance, appears no different than other windows in the district.

The building includes a small holding cell adjacent to the south door. This room, with its walls formed of ceramic blocks with rounded corners, appears to be very much unchanged from the original, and is therefore a very important element of this building. It also includes an interior detention facility. This is a steel bar structure, much like a

cage, freestanding within the rear building, and articulated into several smaller chambers. It appears to be original and essentially unaltered. This is an element of extremely great importance within this historic district.

General Condition: Despite the heavy use related to the around-the-clock operations within this building, it remains in good condition. Typically, there is some attention needed to the roofing tiles. On the north side, the numerous accretions significantly detract from this historic appearance.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Stuccoed hollow clay tile walls * Mission-tile roof * Decorative rafter-tails * Original steel casement windows * Original steel detention windows * Apparatus room doorways with flanking light fixtures and integral protective bollards. * Low-relief decorative elements around first floor doors and windows * Original north double entrance doors with wood 18-light transom * Stepped water-table base at building	* Entrance hall with cast-in-place concrete stair * Original stair railing * Round-head door to storage under stair * Exposed, board-formed second floor and floor framing * Small holding cell adjacent to south door. * The detention facility.

Non-Contributing Elements

Exterior	Interior
 * Infill panels at apparatus doors * Emergency exit stair from second floor * Cantilevered support for cooling equipment, north wall * Cooling and air conditioning equipment, impacting windows * Wiring, piping and conduit, principally at north wall * Single-pane modification to window just right of north door * Infilled windows, east wall 	 * Lowered ceilings * All partitions, doors and trim not original * All wall coverings not original * All flooring and floor coverings not original * Non-historic lighting fixtures

5. Maintenance Considerations

The roof tiles are in need of attention. There are numerous loose tiles, and there are some missing. Hip tiles, like ridge tiles are of critical importance, and should be replaced immediately.

There appears to be some deterioration of the decorative rafter-tails. These important features should be inspected and repaired.

6. Possible Restoration/Enhancement Measures

Although housing the type of functions found within this building places greater burdens in terms of security and communications, steps can be taken to improve the appearance of this historic building.

Because of their very prominent location, the apparatus doors need to be upgraded. Ideally, an infill that has the appearance of the original doors should be the solution. Recognizing that egress requirements from the building may be dictating a personnel door at this location, the next best solution would be one that can integrate a personnel door into a composition sympathetic in character to the original doors. At a very minimum, the infill should be of one consistent material, uniformly colored a darker shade than the surrounding frame, recognizing that historically, the district's doors were painted or stained a dark color.

Using old drawings and photographs for reference, there should be an attempt to locate and install lighting fixtures sympathetic in character to those which once existed to the right and left of the apparatus doors. They are important elements of the original composition of this facade.

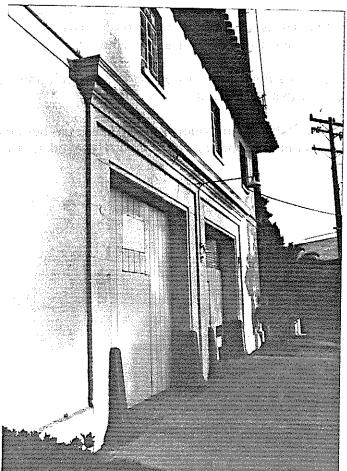
There is a very shallow relief framing the doors and windows at the building's first floor. These frames rely for definition on the thin shadows they cast. At the north wall, the nearly identical thin shadows cast by the numerous pipes, conduits and wire succeed in disguising and entirely overwhelming the architectural definition. Any efforts to consolidate and/or conceal these accretions will pay high dividends in restoring this troublesome facade.

Exiting requirements from the second floor will very likely continue to dictate the continuing existence of the fire escape on the north wall. Long-term planning however, should consider its ultimate replacement with an interior stairway if at all feasible.

Long-term planning should also seek to eliminate all the cooling and air conditioning equipment and support structures appended to this north wall.

Every effort should be made to respect the original doors and windows. Where modifications have altered or destroyed these historic elements, steps should be taken to reverse the damage.



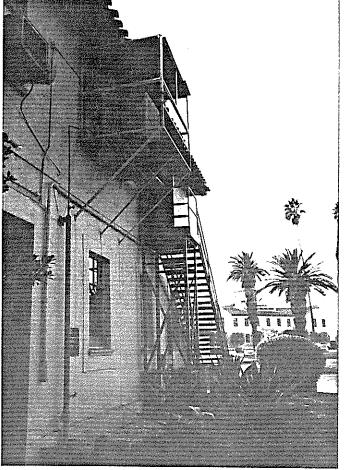


9.21 In-filled apparatus doors. Note original steel casements with transoms on second story.

Selected Photograph of Building Detail



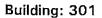
9.22 Original doors.

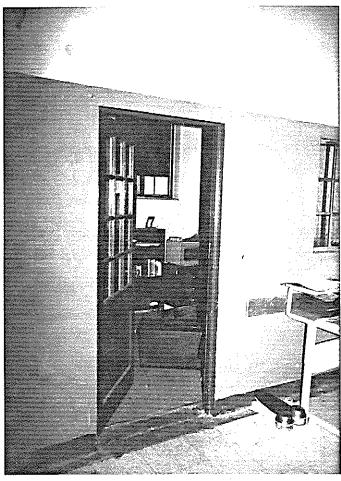


Building: 301

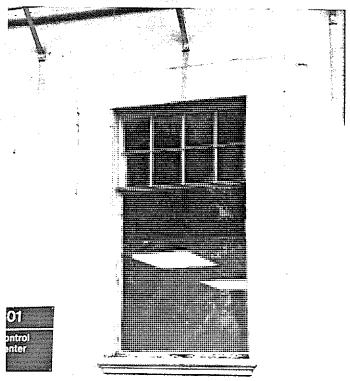
9.23 Accumulation of numerous non-contributing elements, north elevation.

Selected Photograph of Building Detail





9.24 An original 12-light, one panel door.



9.25 Inappropriate single pane window below transom.

Building No.: 315 Historical Use: 24-Carports, Enlisted Personnel

Building: 315

Date Constructed: 1936 Current Use: Storage

Area: 3,960 sq. ft.

2. Historical and Architectural Significance

Building 315 is a unique building within the March Field Historic District, having been constructed as a 24 unit carport for enlisted personnel. The two facing elements are united into a walled courtyard by masonry continuations of the exterior walls. There is a gate at each end of the common space between the two rows of 12 units. Pre-1941 Quartermaster Corps building reports refer to "24 stalls", giving the strong impression that these units were originally stalls, without doors. Built as part of the initial construction in the residential sector of the base, the building retains integrity, and adds to the richness of the historic district.

3. Building Description/Condition

Description: Building 315 is a 1936 sf 24-unit automobile carport. Structurally, it is actually two separate buildings which face one another, forming a courtyard and operating as a single unit. The outer walls of the courtyard (and the three closed sides of each of the two 12-unit buildings) are constructed of stuccoed hollow clay tile walls with wooden interior cross-bracing (**Photographs 9.26 and 9.27**). Based on the vintage of some of the modifications, a continuing series of modifications - most likely of the "self-help" variety - have separated the spaces and ultimately closed off a number of the unit fronts with walls, windows and doors.

General Condition: The condition of this facility is only fair. One side of the complex has just received a new roof, and the opposite side will undoubtedly receive a new roof as well. But facias are significantly deteriorated, and most of the haphazard modifications over the years seem to be in various stages of disrepair. Whether by accident or design, as of January 1994, the most recent comprehensive district-wide repainting project had overlooked this complex.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Stucco-covered hollow clay tile exterior walls all around the complex. * Reverse curve geometry expressing the transition of walls, from "stall" to courtyard wall and gatepost. * Shallow sloping roof over "stalls".	* The basic original wood framing and bracing of the stalls

Non-Contributing Elements

Exterior	Interior
* The numerous modifications to the "front" of the "stalls"	* The partitioning off and modifications to the individual stalls

5. Maintenance Considerations

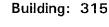
The wood framing, roof framing, and facia which has deteriorated should be repaired if possible, or replaced to match original.

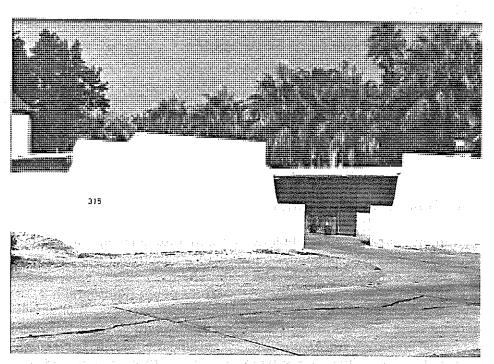
The entire structure needs to be painted.

6. Possible Restoration/Enhancement Measures

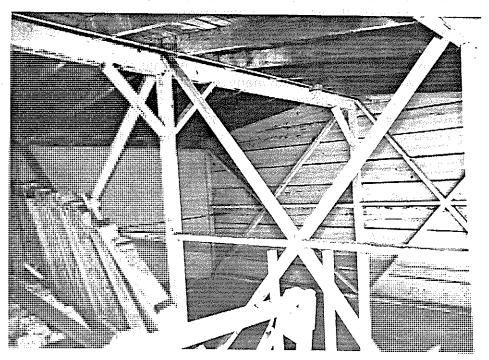
The entire exterior retains its original appearance. The courtyard's interior however, will continue to be non-contributing so long as there are individual areas closed off from the total. It would be unrealistic, although ideal, to expect restoration to the original condition, but those efforts to simplify and unify the "stall" fronts into a quiet, unified composition, will help minimize the alteration. Likewise, a consistent, darker, but not intense, color will help to achieve for the changes a subordinate role.

Selected Photographs of Building Detail





9.26 Exterior walls



9.27 Wooden interior cross-bracing.

Building No.: 317 Historical Use: Barracks for Hospital Personnel Date Constructed: 1934 Current Use: Administrative Offices

Building: 317

Area: 6.106 sq. ft.

2. Historical and Architectural Significance

Building 317 was built to serve as barracks for hospital personnel at March Field. As originally constructed, it borrowed architectural elements from the adjacent hospital and from the enlisted personnel barracks. Although it has been modified, the building retains its essential form and sufficient integrity to be a contributing element of the March Field Historic District.

3. Building Description/Condition

Description: Building 317 is a hollow wall concrete building, measuring 75' x 35', with a two-story wing (originally an open porch) measuring 43' x 12'. It is capped with a single-gabled Mission-tile roof. The ridge runs from side to side, with the slope of the roof continuing down over the two-story front porch (Photograph 9.28). The building has been modified, however, in several important respects. It originally included steel casement windows, identical to those on the adjacent hospital building (Building 323). The original windows were single-pane steel casements with fixed single-pane window above and below. These have been replaced with aluminum sliding windows. The two-story porch was originally an open loggia, with first story arches twice as wide as those on the second story, an element borrowed from the enlisted personnel barracks. The arched openings have been in-filled with rectangular aluminum frame windows and doors piercing the stucco in-fill (Photograph 9.29). There is a small, poured-in-place concrete basement with its original single-panel metal-clad door, and original casement windows. The original restroom configuration, with original glazed brick walls that have rounded interior and exterior corners is still in place (Photograph 9.30).

General Condition: In its current security-oriented role, the building receives heavy use. These uses have generated a great many modifications inside, and substantial changes to the exterior. It has been more the victim of too much, rather than too little attention. There is however, some damage to both roofing tiles and the gutter, and these should be repaired to forestall water infiltration and staining of the walls.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Board-formed double-width concrete walls * Copper gutters and downspouts * Two-story porch with triple-arched first level and six narrow arches across the second level * Small entry canopy at the side	 * Painted-out but original transom over original main entrance door * Original floor finishes where they still exist at entry * Original restroom configuration, with rounded ceramic brick walls * Original exposed concrete ceilings and beams * Basement, with original door and windows * Original stairway to second floor

Non-Contributing Elements

Exterior	Interior
 * Infilled arches at both levels of the porch * Aluminum replacement windows * Lowered ceilings, visible through windows from the exterior * Screening at restroom windows which obscures the windows * Ductwork at rear which covers windows and enters through windows * Ductwork, intruding into the stair landing window 	* Infilled arches at both porch levels * Infilled porches at both levels * Dropped ceilings, which obscure the full windows as well as the beamed ceilings

5. Maintenance Considerations

There are loose and missing tiles at the ridge and at the small entrance canopy. They should be replaced and secured.

There is a damaged rainwater collector at the south corner of the building.

6. Possible Restoration/Enhancement Measures

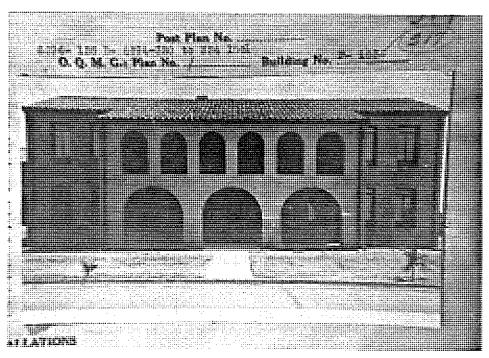
The next time the mechanical systems need upgrading or replacement, efforts should be made to implement the long-term solution of concealed ductwork. If concealment is a genuine impossibility, an effort should be made to locate the ductwork so as not to obscure windows (Photograph 31).

The infill of the porches upset the rhythm of this building, a fact that is particularly notable in the March Field Historic District, where most of the buildings in the historic district retain their essential geometry and the rhythms of the original fenestration. The long-term solution is to return this important element to the open double loggia it was originally (Photographs 9.28 and 9.30). A reasonably sensitive interim measure might be to infill each entire arch with dark glass (with matching spandrel panels if required) in dark frames. Although not a good long-term solution, a quick improvement over the existing condition would lie in painting the infill panel and the aluminum frames a dark color that would relate to the visual impression of the existing glass. This would make it easier to read the entire archway as a single recessive unit, and significantly reduce the negative visual impact of the existing composition.

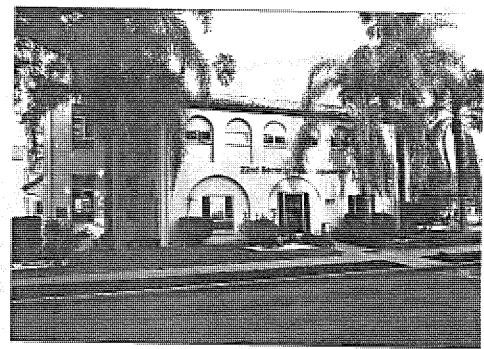
The next generation of replacement windows should recapture the visual quality of the originals, and an effort should be made to restore the original front doors (they were French doors), and clean and utilize the existing original wood muntined transom which is still in place.

Wherever possible, the original high, beamed ceilings should be reclaimed.

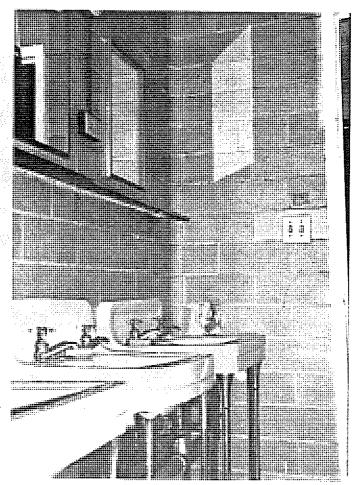
Selected Photograph of Building Detail



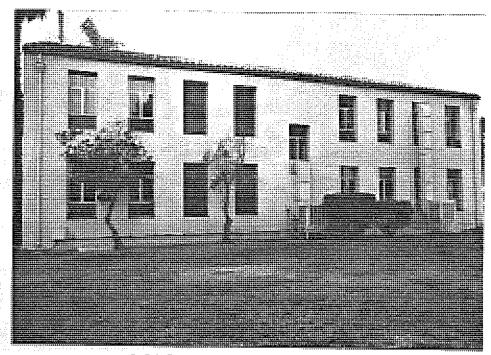
9.28 General view of Building 317, 1934.



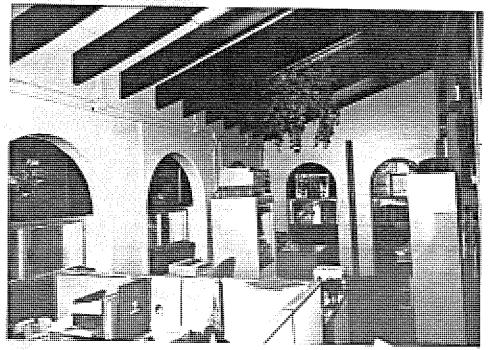
9.29 Facade of Building 317, 1993.



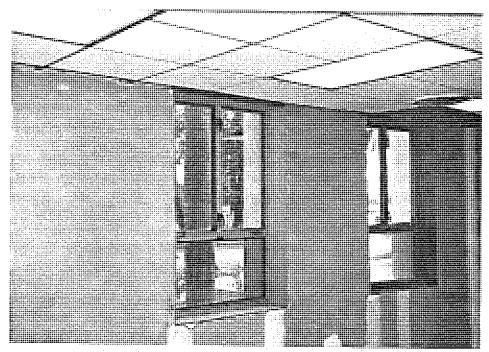
9.30 Original glazed brick walls in restroom.



9.31 Ductwork obscures windows.



9.32 Interior view of porch in-fill.



9.33 Lowered ceilings intrude on window openings.

Building No.: 323

Date Constructed: 1931

Area: 69,925 sq. ft.

Building: 323

Historical Use: Hospital

Current Use: Administrative Offices

2. Historical and Architectural Significance

Building 323, the original hospital at March Field, is one of the more elegant buildings within the historic district, rivalling buildings 100, 470, and the barracks in architectural sophistication. It is also unique among the major buildings within the historic district in that in retains its original windows as well as many important interior features, including a handsome staircase and marble entry lobby. Completed in March 1931, the building was enlarged in 1933 and 1941. These additions were so skillfully executed, however, that the building hardly appears to have been modified. Although not in its original 1931 condition, it is a key contributor to the historic district

3. Building Description/Condition

Description: Building 323 is an administrative building of about 70,000 sf. It is a twostory hollow wall concrete building with a heavy-timber framed, Mission-tile covered gabled roof, built in 1931 but enlarged in 1933 and 1941. It was originally an Hshaped building with the crossbar a long axis paralleling Baucom Avenue and transverse axes forming a rear courtyard, and shorter extensions at the facade, facing Baucom (Photograph 9.34). Perhaps the most striking element of the facade is the principal entrance on Baucom, an architecturally flawless late Georgian composition of terra-cotta, within which there appears to be the original pair of doors topped with an elegant 18-section fanlight (Photograph 9.39). In June 1931, a small one-story, freestanding annex was completed in the center of the rear courtyard (Photograph 9.35). In 1941, the building was substantially enlarged in two respects. First, major two-story additions were made at either end of the main building, continuing the long gable roof beyond the transverse elements. Second, the freestanding building in the rear courtyard was enlarged to two stories and linked to the main building. The additions nearly doubled the original size of the building. The additions are in every respect sympathetic to the original, continuing the original hollow wall concrete construction material and method, windows, as well as the basic design. Noteworthy original interior features include the entrance vestibule and the stairway. At the rear there has been some unfortunate infill of open porches, and there exist a number of non-contributing replacement doors (Photographs 9.40 and 9.41).

General Condition: The general condition of Building 323 is very good, although there are some noticeable signs of weathering and heavy use. These are rust stains and concrete spalling - particularly at stair railings (**Photograph 9.42**); loose and missing tiles; damaged or partially missing gutters/downspouts, and damaged terra cotta ornamentation.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Copper gutters and downspouts * Heavy concrete splash blocks * Board-formed concrete double walls * Principal entrance, including doors, hardware, glazing, fanlight, panelled reveal around door and entire terra-cotta decorative surround * Original metal casement windows with hopper vent across the bottom * Original wrought-iron railings * Original window hardware	 * Entry vestibule floor, walls and ceiling * Original stair and railing * Exposed brick and hollow clay tile at basement * Heavy timber roof construction at attic

Non-Contributing Elements

Exterior	Interior
* Infilled porch elements at both levels * Post office delivery dock * Post office entry door * Private entrance at southwest end of building * Replacement doors * Dropped ceilings visible through windows	* Dropped ceilings * Non-historic partitions, doors and windows

5. Maintenance Considerations

As with most buildings within the historic district, first priority should be given to the roof, where broken and missing tiles pose a threat of water infiltration. There are broken and missing tiles at the building's north corner.

Gutters and downspouts should be checked, repaired, extended and properly diverted as appropriate. Downspout drains onto rear walk without any splash block, near basement stairs. At rear lightwell, one downspout is missing a 5 foot length at the bottom.

Patches at the eastern end of the southwest cross-wing indicate long-term problems of water within the wall and resultant spalling of concrete. This appears to be a longstanding problem because there is evidence of repeated patching. Since this is the only location where this problem is quite evident, a thorough investigation should be undertaken to discover the reason for this continuing problem. Rainwater infiltration would not seem to be the problem, because of the adequate gutter system. Yet it would seem that there is long-term leakage within this wall section from <u>some</u> source not yet discovered.

At the original main entrance, the terra cotta is nicked and gouged.

Rusting, staining and spalling are apparent at the railings. These need attention.

At some of the construction joints between old and newer sections of the building, black mastic waterproofing patches are evidence of water infiltration. The strong color contrast with the building's wall color attracts attention to itself and is distracting. Future work on these construction joints should remove the black mastic, inspect the substrates for adequacy, repair and replacing them as necessary and then re-caulking with either a color-coordinated mastic or a paintable mastic which can be covered with the wall color.

6. Possible Restoration/Enhancement Measures

At the principal facade, the only significant problem is the presence of the aluminum and glass doors to the Post Office (Photograph 41). Coupled with their wide triple-railing stairway, these doors take on a greater visual significance than does the original door. They stand in such stark contrast to the classic beauty of the original front doors, that they negatively impact this resource. Because of the very strong symmetry of this facade, the ideal solution is the relocation of the Post Office doors to a secondary facade, or their complete removal, if the future interior usage of the building will permit.

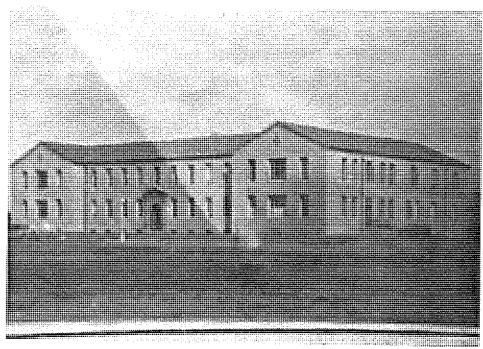
Although not noticeable from the front or sides, the infill of original porch elements, on first floor, second floor or both levels, is also an intrusion (**Photograph 40**). It is hoped that future uses of this building will make possible the reclamation of these porches to their original purpose and appearance. In the meantime, an inexpensive, short term mitigation of the visual intrusion of these infills could be achieved, as in building 317, by applying a single darker color to the plaster and the aluminum frames, thus creating a visually receding monochromatic composition within the total original porch opening.

The Post Office loading dock is an intrusion on the historic structure, as is the associated porch infill. The intrusion is somewhat mitigated by being at the rear of the building, but restoration to the original building geometry should remain the ultimate goal.

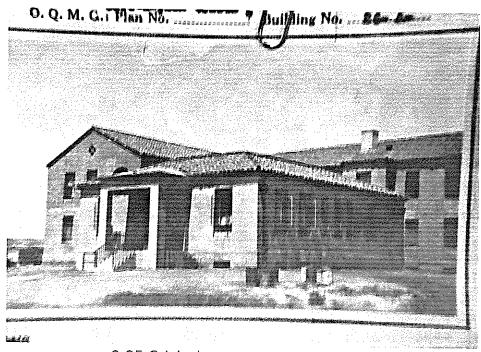
In some locations, the lowered ceilings are noticeable from the exterior. This situation, particularly if the blinds or curtains hang from somewhere across the mid-face of the window, does a great disservice to the historic resource.

The southwesternmost door to the building is also intrusive. The width of the masonry opening would indicate either a window or original double doors with a transom, or a single door with sidelights and a transom. We know that divided light wood transoms over doors were utilized at the exterior. The existing composition is none of these. The single slab (as opposed to stile and rail) door is flanked by blank painted plaster infill and topped with a single sheet of fluted obscure glass. Finally, the door is protected by a lightweight utilitarian metal awning (Photograph 9.43). Granting the need for some protection at this southwest opening (if, in fact, it remains necessary to have one) a better solution may be to recess a more architecturally and historically sympathetic doorway deep enough behind the masonry opening to afford some weather protection, and eliminate the inappropriate little awning.

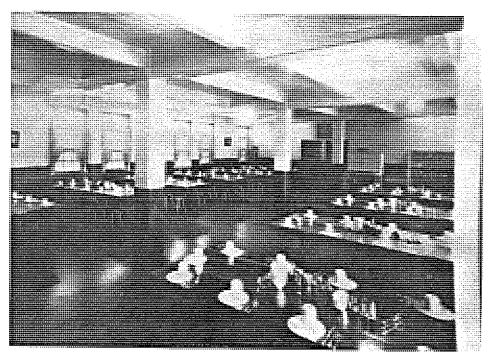
If evidence of original lighting fixtures can be found, an effort to duplicate them or use fixtures sympathetic in character would be appropriate at major entrances, porches and lobbies. If not, the appropriate solution would be very simple contemporary fixtures that do not call attention to themselves.



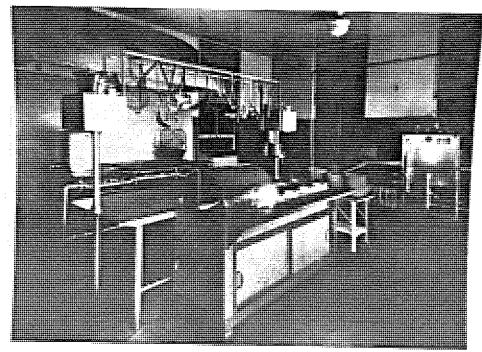
9.34 General view of hospital, 1931.



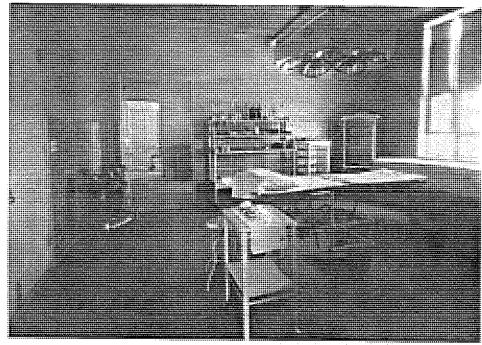
9.35 Original one-story annex, 1931.



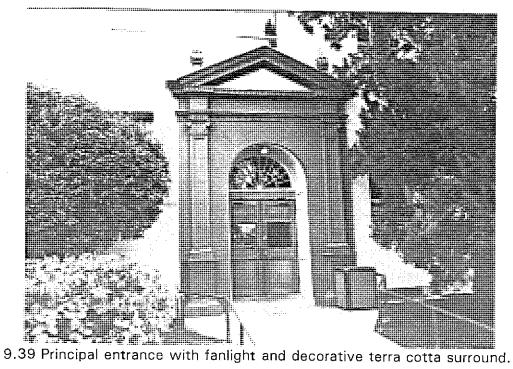
9.36 Mess Hall in hospital, 1930s.

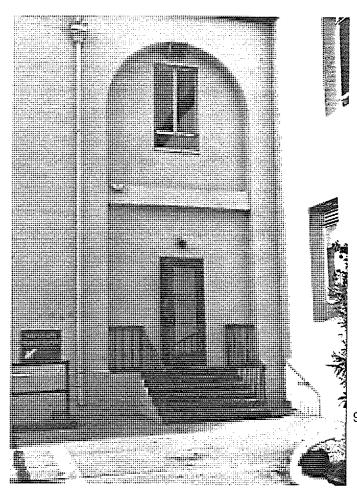


9.37 Hospital kitchen, 1930s.

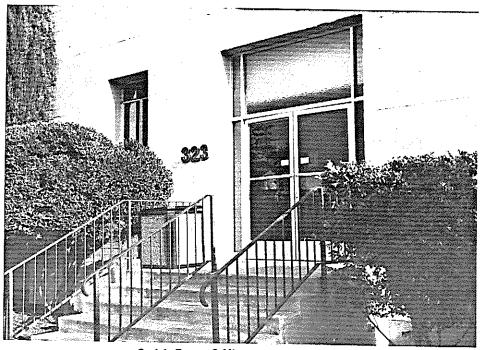


9.38 Main operating room, 1930s.

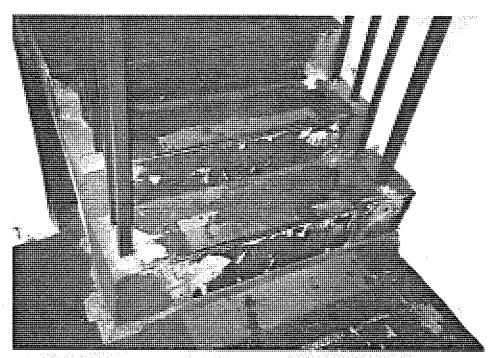




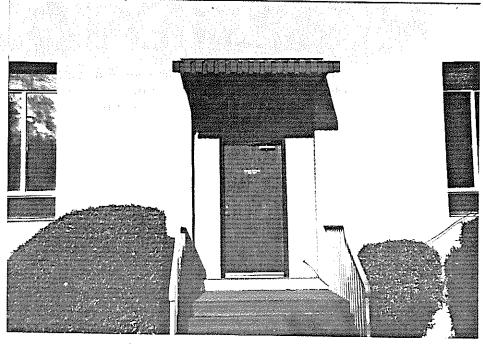
9.40 Porch infill at both stairs.



9.41 Post Office entry doors.



9.42 Concrete spalling on stairs.



9.43 Inappropriate replacement door.



9.44 The facade retains a high degree of historic integrity, including original steel casements.

Building No.: 386 Historical Use: Tool Shed Current Use: Storage

Date Constructed: 1931

Area: 200 sq. ft.

2. Historical and Architectural Significance

Building 386 is a small tool shed, built to operate in conjunction with the firehouse (Building 301). Built as part of the initial construction at the base, the building retains integrity, and add to the richness of the historic district.

Building: 386

3. Building Description/Condition

Description: Building 386 is a 200 sf storage unit, built as a tool shed. It is a stuccoed hollow clay tile building with a hipped roof in Mission tile. It is unusual among March Field Historic Buildings in that it retains its original steel sash and is useful, if for no other purpose, to provide a model in restoring the historical sash (Figure 3).

General Condition: The general condition of the building is fair. The door and frame are deteriorated - the left-hand side of the frame has missing wood members and the interior structure of the wall is exposed. Wood and window trim are in need of paint, and the rafter tails show some deterioration.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
* Mission tile roof * Rafter tails * Stuccoed hollow clay tile * Metal casement windows	* Hollow clay tile * Roof rafters * Roof sheathing	

Non-Contributing Elements

Exterior	Interior
* Replacement door	* Interior partition

5. Maintenance Considerations

The door, and especially the frame, require replacement and repair work.

Both wood and metal trim require preparation and painting.

6. Possible Restoration/Enhancement Measures

An effort should be made to ultimately replace the door with a stile-and-rail type sympathetic to or matching the original (Figure 3).

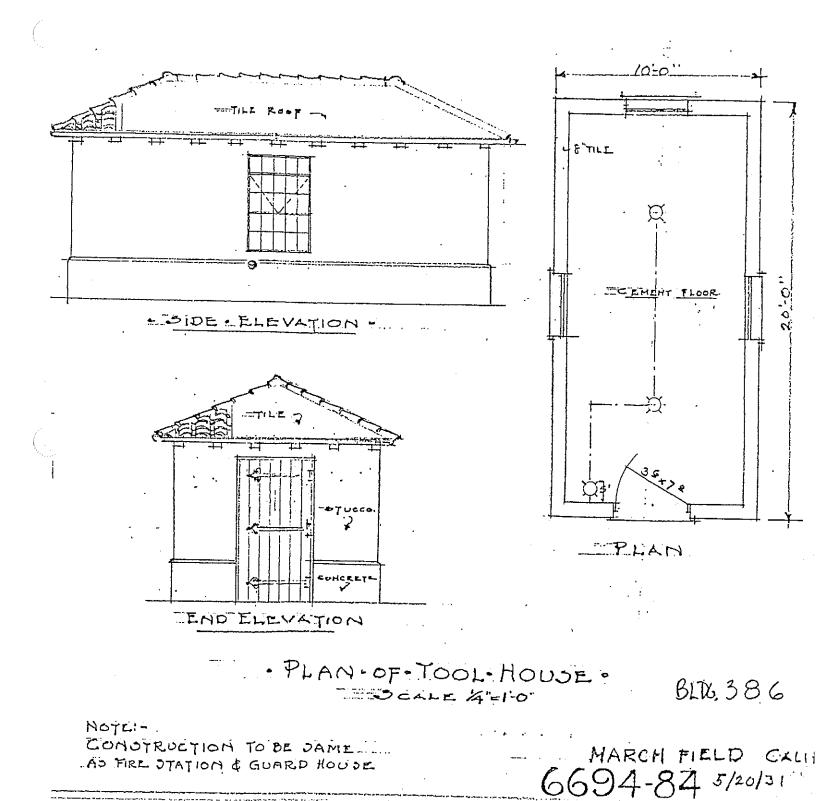


Figure 3. Plan of Tool House (Building 386).

Building No.: 405 Historical Use: Salvage Warehouse Date Constructed: 1938 Current Use: Animal Clinic

Building: 405

Area: 924 sq. ft.

2. Historical and Architectural Significance

Building 405 is important as a remnant industrial building from the period of significance for the March Field Historic District. It and adjacent Building 479 were built in 1938 to serve as a lumber shed and salvage yard. These utilitarian buildings were designed in the essential Mission Revival motif of the historic district. Noteworthy is a curved poured-in-place concrete wall, approximately 6' high, enclosing the rear yards of the buildings.

3. Building Description/Condition

Description: Building 405 is a one-story board-formed reinforced concrete building. It is single walled, enclosing a concrete frame, exposed inside. The hipped roof structure includes wood rafters and wood sheathing, covered with Mission tile (for a 1938 view, see Building Form 479). The ceilings are plastered. The original small, metal, horizontally pivoting windows remain in place (Photograph 9.45). An 8' wide service door once served both the front and rear of the building's central bay, but both are now infilled; a standard door is now found at the rear, and an aluminum "storefront" unit, complete with an aluminum and glass door at the front.

General Condition: The general condition is good. Roofing tiles, gutters, downspouts, walls and windows are all serviceable and in good repair.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
 * Mission tile roof * Copper gutters and downspouts * Board-formed concrete walls * Original metal pivoting sash windows * Concrete wall at rear yard 	* Painted concrete walls * Plaster ceiling	

Non-Contributing Elements

Exterior	Interior
* Aluminum "storefront" infill at front	* Contemporary lighting fixtures

5. Maintenance Considerations

This building appears to be well maintained and serviceable. No problems were discovered.

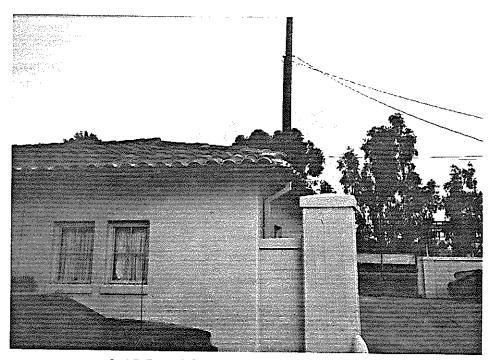
6. Possible Restoration/Enhancement Measures

The front entrance door, in its aluminum "storefront" frame, significantly detracts from the otherwise intact original appearance. Because this element is the focus of the composition of the principal facade, future remodelling work should incorporate an infill system of door and sidelights which is more sympathetic in character to the predominant Mission revival style of the district.

Selected Photograph of Building Detail



9.45 Original window.



9.46 Board formed concrete windows.

Building No.: 406

Historical Use: Water Reservoir

Date Constructed: 1934

Current Use: Water Reservoir

Capacity: 400,000 gallons

2. Historical and Architectural Significance

Building 406 is a contributing element of the infrastructure of the early March Field, being part of the early water delivery system of the base.

Building: 406

3. Building Description/Condition

Description: Building 406 is a 400,000 gallon cylindrical reinforced concrete water tank, approximately 20' high, behind an 8' barbed-wire-topped chain-link fence (**Photograph 9.47**).

General Condition: These grade-level water storage tanks appear to be in reasonably good condition although they all show an overall pattern of numerous patched cracks (crazing).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board-formed concrete walls	* N/A

Non-Contributing Elements

Exterior	Interior
*	* N/A

5. Maintenance Considerations

In order to continue to function adequately, these tanks are required to be well maintained. There are products of relatively new technology which can be applied to the interior of concrete tanks, which effectively makes the walls impervious to the passage of moisture. These should be investigated and utilized.

6. Possible Restoration/Enhancement Measures

Although routinely painted, like other structures within the District, these tanks still retain their original appearance, and are unlikely to change while still operational.

Building No.: 407 Historical Use: Water Tower
Date Constructed: 1934 Current Use: Water Tower

Capacity: 200,000 gallons

2. Historical and Architectural Significance

Building 407 is a contributing element of the infrastructure of the early March Field, being part of the early water delivery system of the base.

Building: 407

3. Building Description/Condition

Description: Building 407 is a 200,000 gallon cylindrical steel water tank supported on an 110' steel tower. It is protected behind an 8' high barbed-wire-topped chain-link fence (**Photograph 9.47**).

General Condition: This water tower appears to be in serviceable condition, and is still functioning in the capacity for which it was constructed.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Steel tank and supporting structure.	* N/A

Non-Contributing Elements

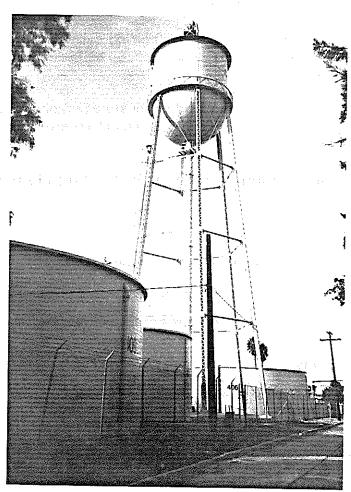
Exterior	Interior
*	* N/A

5. Maintenance Considerations

In order to continue to function adequately, these tanks are required to be well maintained. There is no evidence to the contrary.

6. Possible Restoration/Enhancement Measures

Although routinely painted, like other structures within the District, this water tower still retains its original appearance, and is unlikely to change while still operational.



9.47 Water tanks and tower.

Building No.: 408 Historical Use: Water Reservoir
Date Constructed: 1934 Current Use: Water Reservoir

Capacity: 200,000 gallons

2. Historical and Architectural Significance

Building 408 is a contributing element of the infrastructure of the early March Field, being part of the early water delivery system of the base.

Building: 408

3. Building Description/Condition

Description: Building 408 is a 200,000 gallon cylindrical reinforced concrete water tank, approximately 20' high, behind an 8' barbed-wire-topped chain-link fence (**Photograph 9.47**).

General Condition: These grade-level water storage tanks appear to be in reasonably good condition although they all show an overall pattern of numerous patched cracks (crazing).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board-formed concrete	* N/A

Non-Contributing Elements

Exterior	Interior
*	* N/A

5. Maintenance Considerations

In order to continue to function adequately, these tanks are required to be well maintained. There are products of relatively new technology which can be applied to the interior of concrete tanks, which effectively makes the walls impervious to the passage of moisture. These should be investigated and utilized.

6. Possible Restoration/Enhancement Measures

Although routinely painted, like other structures within the District, these tanks still retain their original appearance, and are unlikely to change while still operational.

Building No.: 409

Historical Use: Water Reservoir

Current Use: Water Reservoir

Capacity: 400,000 gallons

2. Historical and Architectural Significance

Building 409 is a contributing element of the infrastructure of the early March Field, being part of the early water delivery system of the base.

Building: 409

3. Building Description/Condition

Description: Building 409 is a 400,000 gallon cylindrical reinforced concrete water tank, approximately 20' high, behind an 8' barbed-wire-topped chain-link fence (**Photograph 9.47**).

General Condition: These grade-level water storage tanks appear to be in reasonably good condition although they all show an overall pattern of numerous patched cracks (crazing).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board-formed concrete walls	* N/A

Non-Contributing Elements

Exterior	Interior
*	* N/A

5. Maintenance Considerations

In order to continue to function adequately, these tanks are required to be well maintained. There are products of relatively new technology which can be applied to the interior of concrete tanks, which effectively makes the walls impervious to the passage of moisture. These should be investigated and utilized.

6. Possible Restoration/Enhancement Measures

Although routinely painted, like other structures within the District, these tanks still retain their original appearance, and are unlikely to change while still operational.

Building No.: 410 Historical Use: Well House Date Constructed: 1927 Current Use: Storage

Area: 40 sq. ft.

2. Historical and Architectural Significance

Building 410 is important as a remnant industrial building from the period of significance for the March Field Historic District. It was built as a well house and was an active part of the base's water delivery system. It and nearby utilitarian buildings were designed in the essential Mission Revival motif of the historic district.

3. Building Description/Condition

Description: Building 410 is a small well/pump house with an even smaller "dog-house" appended to one side (Photograph 9.48). Both are stuccoed, with Mission-tile roofs, and both retain their original wood doors and windows. The wall material appears to be hollow clay block similar to several other industrial buildings. The main roof structure is a truncated hip, surmounted by an operable square hatch to provide lifting crane access, with wood sheathing under the tile (Photograph 9.48). The tiny addition is gabled. The building appears to be unaltered.

General Condition: This small building appears to be in excellent condition throughout.

4. Inventory of Contributing

and Non-Contributing Elements

Building: 410

Contributing Elements

Exterior	Interior
* Mission-tile roof * Rafter tails * Original windows & doors * Stuccoed exterior	* Exposed structural walls * Exposed roof framing & sheathing

Non-Contributing Elements

Exterior	Interior
* None	* None

5. Maintenance Considerations

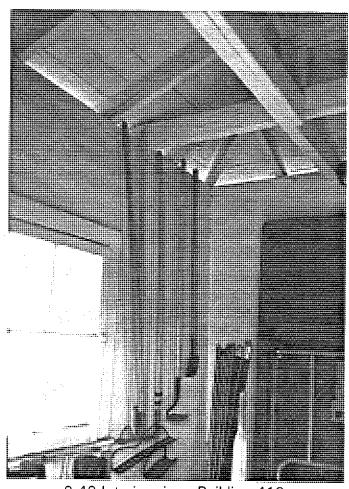
There appear to be no maintenance problems with Building 410.

6. Possible Restoration/Enhancement Measures

This essentially intact building needs no restoration or enhancement measures.



9.48 Exterior view, Building 410.



9.49 Interior view, Building 410.

Building No.: 411 Historical Use: Water Pump House Date Constructed: 1927 Current Use: Water Pump House

Building: 411

Area: 1,831 sq. ft.

2. Historical and Architectural Significance

Building 411, although twice expanded, continues to contribute to the March Field Historic District. The original 24' x 24' building appears to be among the earliest (1927) of the buildings to assume the Mission Revival style, and its construction of what the Quartermaster documents indicate to be "veneered, with hollow tile" is unique. Equally unique is the use of traditional six-over-six double-hung windows--a throwback to buildings constructed at March Field during WWI. This first (westernmost) element, both the exterior and the interior, is of very great architectural and historical significance as a transitional element in the design of March Field's buildings. It was an operating part of the water delivery system of the early base and remains architecturally unified with this Mission Revival historic district.

3. Building Description/Condition

Description: Building 411 is now a 1831 sf building with a hipped Mission-tile roof. Originally, it was a 24' x 24' structure, which from the Quartermaster description and photograph, would appear to be constructed of hollow clay tile, veneered with adobe. The wall thickness is 13", which is consistent with the description. It bears further investigation however, because the interior gives the impression that the walls are wood frame, consistent again with the wall thickness. It has six-over-six double-hung wooden sash windows (which are unusual for this district, but still in place). The windows are in wooden frames. The underside ceiling of its hipped roof is still visible, and the walls and ceiling are finished with fiberboard and wood battens - all still in place (Photograph 9.50).

In the 1930s or 1940s, a hollow clay tile addition more than doubled its area, and the two buildings were stuccoed to unify their appearance. (The hollow clay tile structure of the addition is visible through the now-blocked windows of the original structure.)

Sometime after WWII, the east end of the hollow clay tile structure received a stuccoed concrete block addition of about 200 sf. This addition serves the office functions of an otherwise utilitarian use. Each addition carried with it the hipped Mission-tile roof. Presently there is a lightweight, shed-roofed porch, about $12' \times 30'$, across the eastern end of the building's north side.

General Condition: The building is in fair to good condition. It is essentially an industrial building that is heavily used. Care should be taken with those materials, finishes, doors and windows in the original (westernmost) segment of the building, which date back to the building's origins.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
 * Mission-tile roof * Stuccoed walls * Six-over-six double hung wood windows * Original doors (earliest building) * Rafter tails (different with each addition) 	* Entire interior of the earliest building, including doors, windows, wall and ceiling finish materials * Hollow clay tile walls of middle addition * Ceiling of middle addition

Non-Contributing Elements

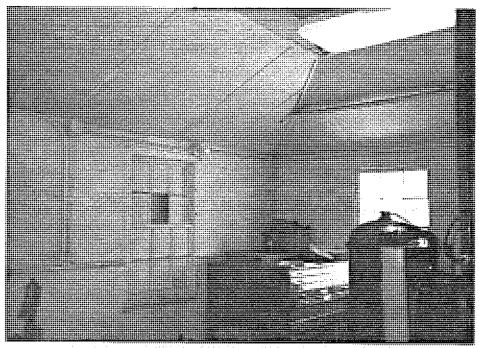
Exterior	Interior
*	* Contemporary finishes * Contemporary lighting fixtures

5. Maintenance Considerations

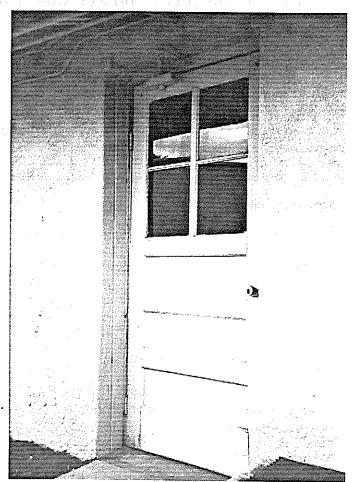
On the south side of the building, some deterioration from weather is evident at doors and trim. Special care should be given to the original six-over-six windows and the original door still existing at the westernmost section of this structure (**Photograph 9.51**). Likewise the interior of this original section of Building 411 is quite fragile and care should be taken to protect -- especially from moisture -- the fiberboard wall and ceiling finishes as well as the wooden wainscot.

6. Possible Restoration/Enhancement Measures

More than any other building within the historic district, this building shows the evolution of design and construction over the life span of March Field. For that reason, it should be preserved and maintained as is, so that the changing designs and construction methods continue to retain their identity.



9.50 Interior view showing underside of hipped roof, board and batten siding, and original windows, blocked by the addition.



9.51 Original door.

Building No.: 412 Historical Use: Water Pump House Date Constructed: 1943 Current Use: Water Pump House

Building: 412

Area: 246 sq. ft.

2. Historical and Architectural Significance

Building 412 is a contributing element of the March Field Historic District. It was an operating part of the water delivery system of the base and is architecturally unified with the remainder of the Mission Revival historic district. It is unique among the contributing buildings within the historic district in that it was constructed of adobe.

3. Building Description/Condition

Description: Building 412 is a 246 sf adobe-walled building on a concrete foundation. The hipped roof is wood framed and sheathed, and covered with Mission tile. The building has four eight-over-eight, wooden double-hung windows in wood frames (all now totally painted over), and two relatively new doors and frames. The space is divided into two equal sections. The 1 x 6 rafters extend out from the wall to support the overhang. The rafter-tails are straight-cut and unadorned, and there is no rain gutter (Photographs 9.52 and 9.53).

General Condition: The condition of the building is good except at the base where splashing rainwater is beginning to erode the adobe.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission tile roof* Adobe block wall* Eight-over-eight double-hung wooden windows	* Adobe walls * Wooden rafters and sheathing

Non-Contributing Elements

Exterior	Interior
*	* New pair of doors and frames at south side.* Contemporary lighting

5. Maintenance Considerations

Some of the roof tiles are missing (at the hip), and a number of the wooden tile-fillers along the eaves are fair to poor condition. The metal cap vents at the ridge are rusted. All these need attention.

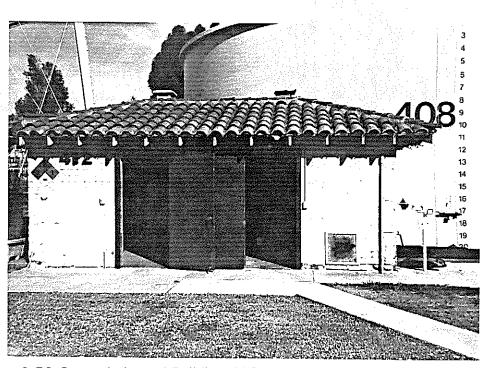
The double-hung windows are in need of some attention. At least one, on the north side, is a little racked and out of square (Photograph 9.53).

Adobe walls should be protected from rainwater runoff. Historically, this protection would have been provided by a wide porch along the eaves. A rainwater gutter is a more contemporary solution. One or the other will be required to prevent erosion of the adobe at the base of this building by splashing water.

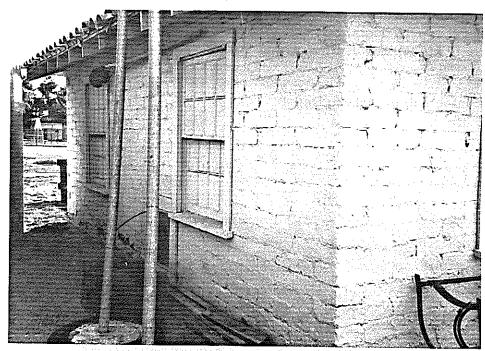
6. Possible Restoration/Enhancement Measures

"Painted-over" windows are better than removal of windows and infill with some other material. Nevertheless, repaired and transparent windows should be the goal, in keeping with the building's original appearance.

The replacement of the existing "slab" doors with a stile and rail door more sympathetic with the character of the walls and windows, should be a long-term aim. Enough original doors still exist in the district to be able to select an appropriate design for a future replacement.



9.52 General view of Building 412, showing replacement doors.



9.53 Adobe walls. Double-hung windows are original, but painted over and in need of repair.

Building No.: 413

Historical Use: Bakery

Building: 413

Date Constructed: 1917 Current Use: Swimmer's Bath House

Area: 1,586 sq. ft.

2. Historical and Architectural Significance

Building 413 is a key contributing element of the March Field Historic District because it is the sole remaining building from the first generation of construction at the base during World War I. It was built as a bakery for the first March Field. During the second phase of construction at March Field, this building was incorporated into the operation of the officers' swimming pool, which exists just to the south of it. The building is of interest because it documents the method of construction used during the "temporary" building period of the First World War (**Photograph 9.54**).

3. Building Description/Condition

Description: Building 413 is a 1586 sf wood frame building with stucco finish. Its hipped roof is covered in composition shingle. Located within the area of the Bachelor Officers Quarters, the old bakery was remodelled after 1933, first as a servants' quarters for the BOQ and later as a dressing room and office for the swimming pool. Its exterior retains a high degree of integrity, given its age and the changes in use. The stucco finish is original. It also includes virtually all of its original 6/6 double-hung wooden windows. Patches in the plaster telegraph the location of other windows which have been removed (Photograph 9.55). Another interesting feature is an original small porte cochere, located on the west, recently used as a vending area for the pool patrons. Rain gutters were never installed on this building. The building is largely unused.

General Condition: The general condition of this vacant building is only fair. Although no roof leaks were apparent on the interior, the composition roof, which is at least two, maybe three layers thick is deteriorating. In one location, a 6-pane window sash has collapsed in place, prevented from falling by the heavy mesh screen (Photograph 9.56). Elsewhere, other windows are broken. The interior is only slightly less deteriorated.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
* Composition roof * Stuccoed walls * Six-over-six wood double-hung windows * Wood doors with windows in the top half	* Plastered ceilings	

Non-Contributing Elements

Exterior	Interior
* Windows with top half painted over	* Interior partitioning * Contemporary lighting fixtures

5. Maintenance Considerations

All vacant buildings are at risk. Moisture penetration can go unnoticed until significant damage has occurred. The musty smell of the interior is evidence of a lack of ventilation that can be harmful to structure and finishes.

The broken windows should be repaired.

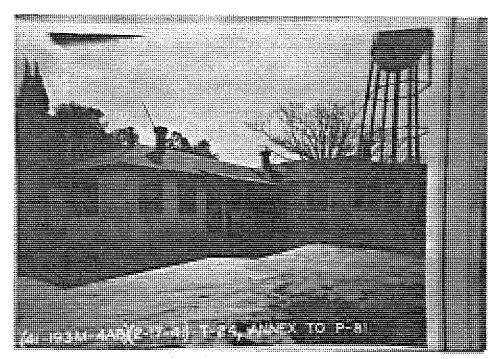
The building's facia is deteriorated and separated in several locations. The facia should be repaired or replaced.

The eaves and the facia are badly in need of painting--after careful preparation.

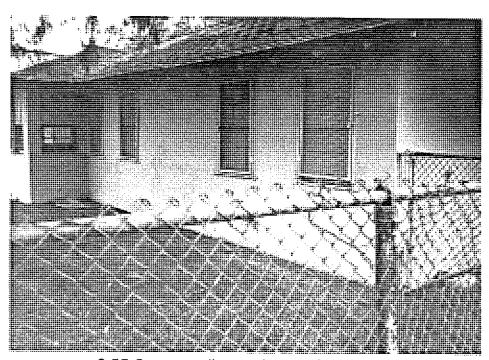
Vent screens are filled with paint, and unable to adequately ventilate.

6. Possible Restoration/Enhancement Measures

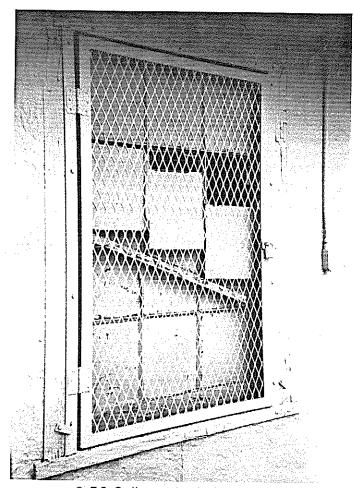
The building has undergone major remodellings at least twice. The exterior still shows evidence of its earlier uses. Any further remodelling should respect and, if possible, restore the original openings. Paint should be removed from the glass on the south side of the building, and, if sun control is the problem, blinds or awnings should be utilized instead. Little of the interior remains, but future work should try to retain or recapture as much of the original geometry and materials as the use will permit.



9.54 Post Bakery, ca. 1935.



9.55 Stucco walls, patches, and original sash.



9.56 Collapsed window sash.

Building No.: 417

Date Constructed: 1934

Area: 776 sq. ft.

Building: 417

Historical Use: Radio Hut

Current Use: Storage

2. Historical and Architectural Significance

Building 417 is a contributing element of the March Field Historic District. It served as the second "radio hut" on the base, replacing Building 148. It is also unique from an architectural standpoint, being a nicely-proportioned neo-classical building within a predominantly Mission Revival district.

3. Building Description/Condition

Description: Building 417 is a 776 sf hipped roof building with hollow clay tile walls, covered in stucco. It includes neo-classical details not found elsewhere on the base: quoins at the corners, a pedimented entry, corniced overdoor and corniced wood trim at the eaves (**Photograph 9.57**). Its windows are original steel casements (**Photograph 9.58**). Somewhat incongruously, this small neo-classical composition has always been covered in heavy Mission tile with copper gutters, like all other major buildings at March Field. The building retains a very high degree of integrity.

General Condition: The condition of the building is good. A pair of windows, flanking the entrance, have been painted over. At the rear, a new door has been installed with a resultant unsightly patch surrounding it (Photograph 9.59). There is some peeling paint, some deterioration to the wood cornice under the eaves and some damage to the gutter and roof tiles due to the proximity of a tree. The building's interior has been completely remodeled. The original walls have been furred, adding about 4-1/2" to the wall thickness. There are new doors, frames and hardware (Photograph 9.60).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission tile roof * Copper gutters and downspouts * Stuccoed hollow clay tile walls * Decorative entry * Pedimented gable with circular vent at entry * Decorative quoins at entry	* Original steel casement windows

Non-Contributing Elements

Exterior	Interior
* Rear door	* All the "contemporary" alterations, mentioned above

5. Maintenance Considerations

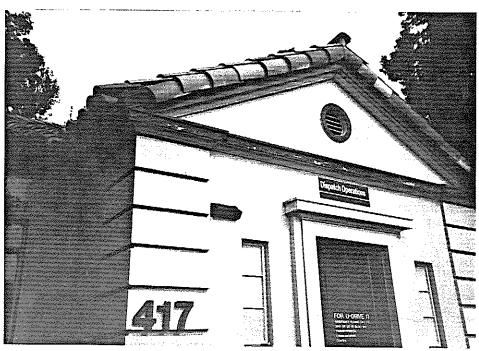
The building is currently being used for storage, but it is unheated and essentially unattended.

There is some loss of the roof tiles and damage to the gutter, both of which require attention. Missing hip tiles are an invitation to leaks (Photograph 9.58).

The wooden cornice trim is in need of careful preparation and painting.

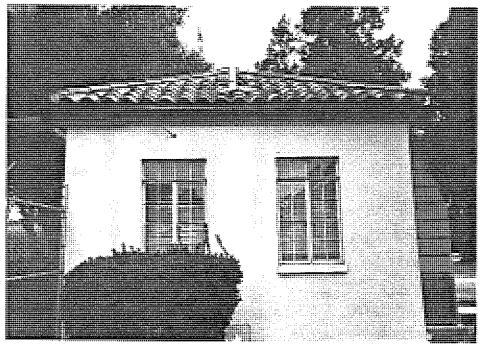
6. Possible Restoration/Enhancement Measures

The paint should be removed from the glass of the two front windows. When scheduled for replacement, both the front and rear doors should be replaced with units more sympathetic in character to the strong neo-classical character of the building.



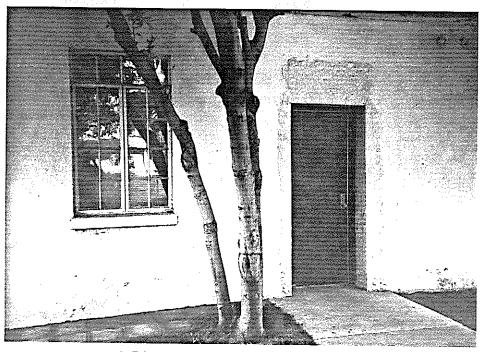
9.57 Neo-classical facade. Note peeling paint on trim and painted out windows.



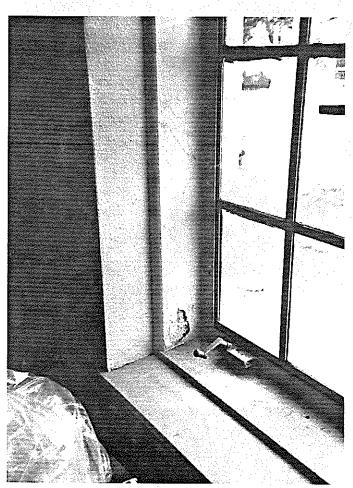


9.58 General view showing original steel casements.

Note missing hip tiles at left.



9.59 New door with unsightly patch.



9.60 Furring over original walls.

Building No.: 418 Historical Use: Motor Pool Building
Date Constructed: 1934 Current Use: Motor Pool Building

Area: 1141 sq. ft.

2. Historical and Architectural Significance

Building 418 is a contributing element of the March Field Historic District. It was built in 1937 to serve as headquarters for the motor pool, a function it retains today. Although a frankly utilitarian building, it is consistent with the base generally in its stuccoed surfacing and tile roof.

Building: 418

3. Building Description/Condition

Description: Building 418 is a 1141 sf hip-roofed building with hollow clay tile walls, covered in stucco. Original, horizontally pivoted steel sash windows are still in place, as are the original "cast stone" window sills (Photograph 9.61). There is a roof overhang of approximately 12", with unarticulated rafter tails supporting 1 x 6 wood roof sheathing (Photograph 9.62). Mission tiles cover the roof, and there appears to never have been a gutter or downspout system. Two windows have been removed and patched with less-than-matching plaster, flush with the exterior wall (Photograph 9.63). A small wood-framed addition, also stuccoed, attaches to the southeast end of the building. The interior is very significantly altered, with new partitions and doors, along with a dropped lay-in ceiling approximately 12" below the existing original ceiling.

General Condition: The general condition of the building, both inside and out, is very good. Probably because there are no trees nearby, the roof looks very good.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
* Mission-tile roof * Stuccoed hollow clay tile (or hollow clay brick) exterior walls * Original horizontal-pivoting steel sash	* Original windows	

Non-Contributing Elements

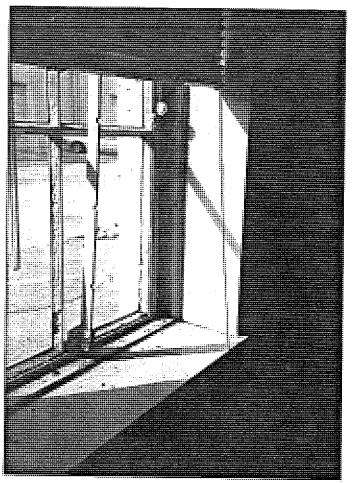
Exterior	Interior
* Tell-tale flush patches from infilled windows	* All new work: walls, doors, ceiling

5. Maintenance Considerations

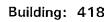
The building appears to be well maintained. There are some lowered elements around the building which could hold standing water. These need to be monitored to insure that accumulated water will not flood the interior.

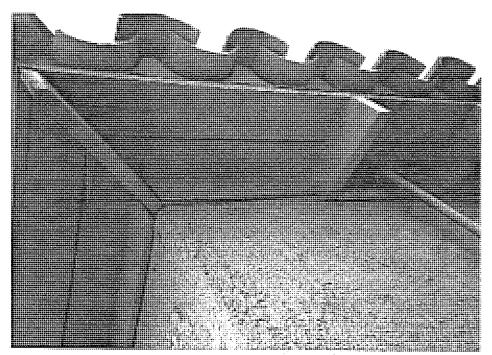
6. Possible Restoration/Enhancement Measures

Restoration of the infilled windows should be undertaken when practicable.

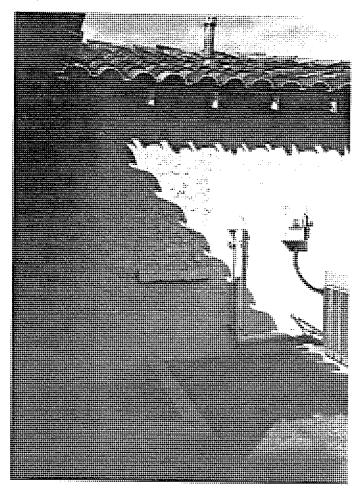


9.61 Original pivot window.





9.62 Rafter tails and wood roof sheathing in good condition.



9.63 Infilled window with flush patch.

Building No.: 431 Historical Use: Electrical Switch House Date Constructed: 1929 Current Use: Electrical Switch House

Building: 431

Area: 684 sq. ft.

2. Historical and Architectural Significance

Building 431 is an industrial building located in the historic Quartermaster Corps sector of the base. The Quartermaster buildings, all utilitarian buildings, were historically indispensable to the operation of the base. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic facility.

3. Building Description/Condition

Description: Building 431 is a small electrical switch house built in 1929. It is a board-formed concrete building with a tiled hip roof. It was expanded some time after 1941 from an area of 400 sf to its current 684 sf. The addition was handled so skillfully, however, that the modification is hardly apparent. Both sections retain their original 6/6 double hung wood sash windows (**Photograph 9.64**).

General Condition: Apart from some neglect of the gutters, the condition of the building appears to be generally good.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	ş, î	Interior	
* Mission-tile roof * Board-formed concrete walls * Original 6/6 double-hung wood sash windows * Copper gutters and downspouts * Exposed rafter-tails		* Original exposed walls * Windows	

Non-Contributing Elements

Exterior	Interior	
Window-mounted air conditioners Adjacent equipment and material	*	

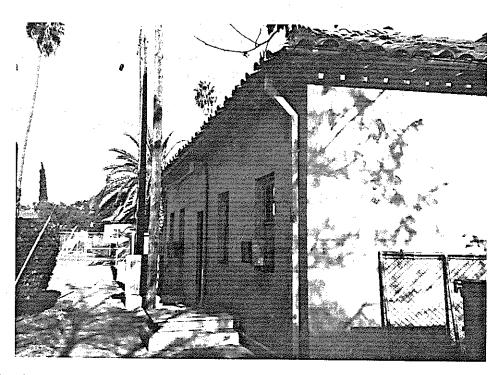
5. Maintenance Considerations

There is loose tile on the roof facing the flight line.

All the other sides of the building have damaged or missing elements of rain gutters and/or downspouts.

6. Possible Restoration/Enhancement Measures

This building is essentially intact. The only addition to its authenticity, as the need for new doors arise, would be 5-panel doors to match those commonly found in the residences of the historic district.



9.64 General view of Building 431 showing window mounted air conditioners.

Building No.: 432 Historical Use: Boiler Room Date Constructed: 1941 Current Use: Storage

Building: 432

Area: 1,641 sq. ft.

2. Historical and Architectural Significance

Building 432 is an industrial-type building located in the historic Quartermaster Corps sector of the base. These Quartermaster structures were historically indispensable to the operation of the historic base. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic facility.

3. Building Description/Condition

Description: Building 432 is a former laundry boiler-house, now used principally for storage. It is a reinforced concrete framed building, two stories in height, with board-formed reinforced concrete walls. There are concrete beams supporting a flat concrete roof surmounted by a windowed monitor centered at the roof. Two added offices with a storage mezzanine over, border the northeast wall, and another small office, accessed by a metal stair, exists over what appears to be the original restroom in the structure's south corner. The horizontally pivoting steel sash windows are original, as is the large sliding double door on the southeast side. This original door contains a "man-door" along with a glazed section above. Except for the windows in the monitor, which are still chain-operable, most are painted over (Photograph 9.65).

General Condition: The building appears to be in excellent condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior .
* Board-formed concrete walls * Original windows * Original bi-parting steel and glass door with man-door * Shallow stepped parapet	* Board-formed walls * Rooftop monitor and windows * Concrete frame and beams

Non-Contributing Elements

Exterior	Interior	
Window-mounted air conditioners Paint on the window-glass	* Later partitions * Lighting fixtures	

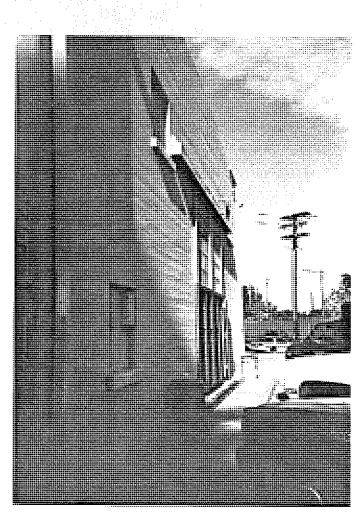
5. Maintenance Considerations

The building appears to be well-maintained. The essentially flat roof, concealed behind the parapet, has the potential to be neglected until leakage problems generate the need for immediate action. A program of routine inspection of roof and flashing, for signs of trouble, can prevent problems that could lead to leakage damage to the interior.

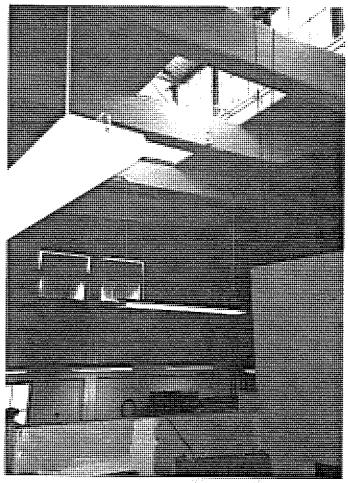
6. Possible Restoration/Enhancement Measures

The painted-over glass is a reversible condition that, hopefully, can be remedied by less intrusive means in the future.

The large doors on the southeast side of the building are of historic architectural interest. They should be maintained in good working order, and should not be replaced.



9.65 Steel sash and sliding double door.



9.66 Interior view, showing clerestory windows.

Building No.: 433 Historical Use: Bakery
Date Constructed: 1931 Current Use: Storage

Building: 433

Area: 3,724 sq. ft.

2. Historical and Architectural Significance

Building 433 is located within the old Quartermaster Corps sector of the base. Quartermaster buildings were historically indispensable to the operation of the historic base. Generally comprising large industrial-style buildings, the Quartermaster Corps sector is an important component of the March Field Historic District, adding visual interest to the larger district and facilitating a more complete interpretation of the operation of this historic facility.

3. Building Description/Condition

Description: Building 433 is a stuccoed, gable-roofed, hollow clay block walled industrial building, originally 66' long and 30' wide. The wood-framed and wood-sheathed roof, covered with asphalt shingles, now has an additional covering of a composite sheet material formed to take on the appearance of Mission tile (Photographs 9.67 and 9.68). At the front there is a parapet with concrete coping, rising to a peak at the ridge. A similar very shallow parapet exists at the rear. The floor of this building, unlike most in this area, is raised nearly four feet above the surrounding grade. There are original interior partitions of hollow clay brick or tile. Because of the building's original use as a bakery, these partitions may have been constructed of a glazed block; however they are all painted over at this time (Photograph 9.69). There have been major modifications to the original openings on the southeast side of the building, and there has been constructed a major addition on the northwest side. Although it obscures one elevation and doubles the size of the building, the addition does not altogether destroy the integrity of this building.

General Condition: The general condition of the building is good. Like many other buildings, the only apparent problems are with the gutters.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Stuccoed hollow clay block walls * Remaining original steel sash windows (1 at front, 2 at rear) * Parapet with capstone * Louvered attic vents	* Painted hollow clay block or tile exterior walls and partitions, exposed at interior * Roof structure of 6 x 8's at 48", with 1 x 6 straight sheathing

Non-Contributing Elements

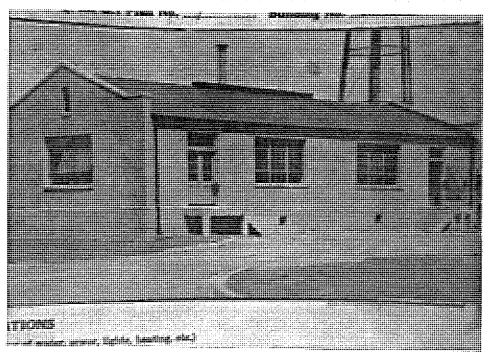
Exterior	Interior	
 Delivery door , southeast elevation Composite "Mission" style roof Major addition Blacked out window and door openings 	* Major addition	

Maintenance Considerations

Except for the gutters, maintenance appears to be good. The gutters sag and/or are bent at all elevations where they occur.

6. Possible Restoration/Enhancement Measures

Quartermaster documents show a photograph of the southeast elevation. This should provide guidance for any future modifications to doors and windows. The windows were center pivoting steel industrial sash with a row of fixed-lights at the top and bottom. The doors were nine-light over one panel doors with a transom above. Future plans for the building should consider the removal of the addition to the northwest, space requirements permitting.

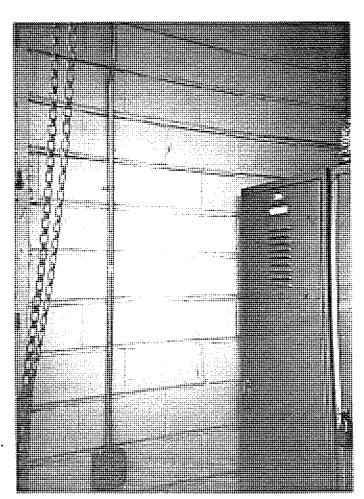


9.67 General view, southeast elevation, 1933.

Building: 433



9.68 General view, southeast elevation, 1993.



9.69 Tile walls.

Building No.: 439

Date Constructed: 1927

Historical Use: Water Pump House

Current Use: Water Pump House

Area: 196 sq. ft.

2. Historical and Architectural Significance

Building 439 is a contributing aspect of the March Field Historic District. It was an operating part of the water delivery system of the early base and is architecturally unified with the remainder of the Mission Revival historic district.

Building: 439

3. Building Description/Condition

Description: Building 439 is a vacant 196 sf stuccoed hollow clay tile building with a wood-framed and wood-sheathed hipped tile roof surmounted by a small square removable hatch. It still retains its original steel casement windows (**Photograph 9.70**).

General Condition: The building's condition is only fair. It appears to have been overlooked in the last painting project because the paint is peeling and the windows are broken. Structurally, it is still sound.

4. Inventory of Contributing and Non-Contributing Elements

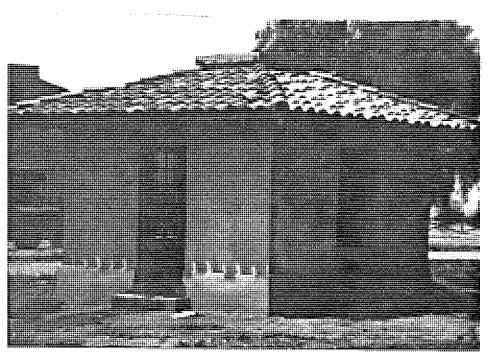
The building is essentially intact.

5. Maintenance Considerations

The most serious concerns are the broken windows. They need to be repaired, reglazed and recaulked, then painted. There is spalling plaster which need repair. The inappropriate flush wooden door is delaminating from moisture penetration. It should be repaired or replaced. Broken Mission tiles should be replaced.

6. Possible Restoration/Enhancement Measures

Except for the door, everything appears original. The door should be replaced with one which is more historically appropriate.



9.70 General view of water pump house, ca. 1930.

Building No.: 463

Date Constructed: 1943

Historical Use: Bowling Center

Current Use: Fitness Center

Building: 463

Area: 18,821 sq. ft.

2. Historical and Architectural Significance

Building 463 is a contributing element of the March Field Historic District, helping to anchor the enlisted personnel recreational sector of the base. This sector includes four contributing buildings, all designed to serve the recreational and social needs of the hundreds of enlisted personnel stationed at the base. Although each of these four buildings is modified to one degree or another, they retain sufficient integrity -- individually and as a group -- to contribute to this historic district.

3. Building Description/Condition

Description: Building 463 is a reinforced concrete building, constructed in 1943 but within the general design standards for March Field. It draws inspiration from nearby industrial buildings, particularly the Quartermaster warehouses. The principal element, which originally contained the bowling lanes, is truss-roofed. The parapet at the front and rear reflects the truss shape--flat at the middle and sloping down to the side walls, with the changes in slope accented with small chimney-like finials. This central element was expanded to the southeast at the time of construction or early thereafter, because the construction and decorative elements match the central element. Much later, very likely during the Vietnam years, a substantial addition to the northwest was built (Photograph 9.71). And although the addition balances the composition, its character is far removed from the original, making it an unsatisfactory element from a historic preservation perspective. The principal facade suffers from the intrusion of a "picture window" replacement, an aluminum storefront entrance and the indifferent replacement with louvers of part or all of the upper level windows (Photograph 9.72). The lobby retains its original "Art Deco" geometry, and along the front and southeast sides much original partitioning, doors and hardware remain. The existing original stairway to the attic reveals the building's 2 x 8 roof joists, and the "Mens Room" reveals the original ceiling heights and retains a painted-over original window. The bowling lanes have been removed or covered, and the building now serves principally as an aerobics center.

General Condition: This heavily used building shows signs of wear. In addition, much of it has been altered without respect to the historic character. Aside from some evidence of roof leaks, however, its physical condition appears to be good and evidence of the original design and geometry remains.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Stuccoed walls * Mission-tile roofed entrance porch * Original steel sash windows * Parapet, front and rear * Original "stave-type" door (delaminating) at southeast facade	* Rounded (Art Deco) lobby walls * Original remaining plaster walls & ceilings

Non-Contributing Elements

Exterior	Interior
 * "Picture window" * Louvered inserts at upper windows * Concrete block addition & facia * Painted-over windows * Aluminum storefront entrance 	* Contemporary modifications & lighting

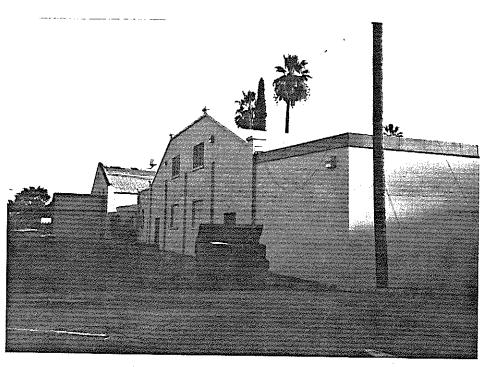
5. Maintenance Considerations

At the rear, two doors have been added in a rather crude manner; plaster is spalling around the bolted fastenings of the frame. It is impossible to see daylight at several roof drain scuppers, indicating blockage of rainwater--a very likely contributor to roof leaks. Elsewhere, there appear to be no significant problems.

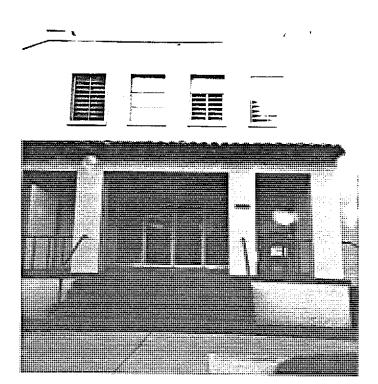
Possible Restoration/Enhancement Measures

There should be an effort to restore the original facade as use of the facility and funds permit. One restorative measure would be to replace the picture window to match the original composition. Another measure would be to relocate the upper level louvers with windows to match, or install louvers all across, or, at a minimum, to balance the composition, so that the appearance is not so haphazard. A third recommendation is to remove the metal awnings and replace with some other means of sun control such as fabric awnings or heat-reflective glass or film. The dark paint at the deep facia on the northwest side of the building attracts attention to this feature which has no historic counterpart: it should be painted the color of the wall to blend rather than contrast. Finally, an entrance of something other than aluminum storefront material, sympathetic in character with this building and the neighboring gymnasium, should be the goal when replacement becomes warranted.

Building: 463



9.71 Major addition to northeast side.



9.72 Intrusive door and second story louvers at facade.

Building No.: 465

Date Constructed: 1933

Historical Use: Gymnasium

Current Use: Gymnasium

Building: 465

Area: 23,690 sq. ft.

2. Historical and Architectural Significance

Building 465 is a strong contributing element of the March Field Historic District, anchoring the recreational sector of the base. This sector includes four contributing buildings, all designed to serve the recreational and social needs of the hundreds of personnel stationed at the base. Although each of these four buildings is modified to one degree or another, they retain sufficient integrity -- individually and as a group -- to contribute to this historic district.

3. Building Description/Condition

Description: Building 465, the base gymnasium, is a massive structure, measuring 143' x 114' at the time it was constructed. Most of the area comprises the clear span gymnasium. With its large bands of steel sash along the side elevations, the building resembles warehouses in the nearby Quartermaster area. The industrial appearance is softened, however, by the fenestration and detailing at the entrance and corners: quoins at the corners, a large two-story arched entry composition with voissoir-like incising, decorative grillwork at the vent, and a tile-roofed porch at the entry (Photographs 9.73 and 9.74). This 1933 building contributes to the historic district, despite a major 1956 concrete block addition to the left and a metal-sided addition at the rear. The building's interior includes important and intact elements, most notably the gymnasium floor, and the balcony seating area over the front dressing rooms and offices (Photograph 9.75). Apart from the gymnasium and balcony, much remodelling has occurred over the years, significantly altering all the other interior spaces. A ceiling was hung over the gymnasium floor some time after WWII, and major alterations to the dressing rooms generated a whole series of ventilators protruding from the painted-over windows of the facade (Photograph 9.76). What had originally been a small bowling alley at the rear, was converted to a pair of handball courts, with another pair added later in the rear addition.

General Condition: In general, the condition of the building is good. There is evidence, from stains on the ceiling, of past leaks in the roof. The areas of the building not requiring a high level of maintenance for playing purposes are somewhat shopworn and rundown, undoubtedly due to the high level of use.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Stuccoed walls * Two-story entrance composition of entry doors, with the cantilevered porch roof, surmounted by the round-topped decorative composition containing a large window with a decorative tile inset above * Steel casement windows at entrance facade * Quoins at all four corners of the building * Decorative side exits near the front of the building, complete with tile insets and upper windows * Bands of steel industrial sash along building sides * Attic vents with decorative grillework * Outriggers and facia board at eaves * Gutters and downspouts	* Wood gymnasium floor * Exposed hollow clay block walls * Wood walls of "old" handball courts * Original panelling still in place at second level between "old" handball courts

Non-Contributing Elements

Exterior	Interior
Ventilators protruding from windows at principal facade Painted-over windows at principal facade Painted-over decorative work at two-story entrance composition Replacement entry doors Concrete block addition on northwest side of building Painted-over windows and decorative work at southeast side of building Rear addition	* Gymnasium ceiling * Under-balcony modifications and remodellings

5. Maintenance Considerations

In some locations along the eaves, the metal facia is damaged. Doors show evidence of hard use, as do locker-room facilities.

6. Possible Restoration/Enhancement Measures

The existing facade suffers heavily on three counts:

- 1. The painted-over windows.
- 2. The ventilators protruding from them.
- 3. The painted-over decorative work.

Comprehensive studies have not been made, but because of the slope of the balcony floor, it would appear that adequate space exists above these locker rooms, to collect and dispose of air in some other way than the existing ventilators. Rerouting the air in such a way so as to avoid impacting the facade would provide enormous benefits to the appearance of this important building.

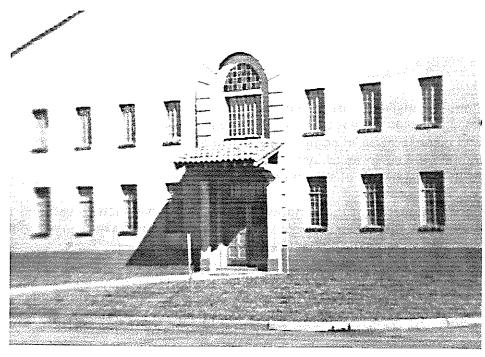
Paint removal from the windows, or an alternative such as painting the inside of the windows with a color that conveys the impression of a darkened room beyond, would do much to reclaim this facade.

If they are terra-cotta or cast stone, paint should be removed from the decorative work at the quoins and around the doors. If these elements are simply modelled stucco, they should be subtly accented by a slight lightening of color, with the infill within the arches darkened as discussed with buildings 317 and 323.

Selected Photograph of Building Detail



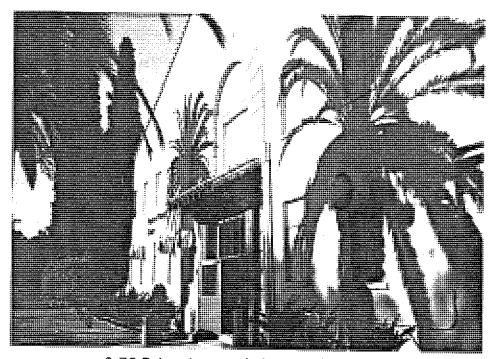
9.73 General view of gymnasium, 1930.



9.74 Decorative main entrance, 1933.



9.75 Building interior.



9.76 Painted over windows and ventilators.

Building No.: 466 Historical Use: Base Exchange Date Constructed: 1933

Building: 466

Current Use: Offices

Area: 22,601 sq. ft.

Historical and Architectural Significance

Building 466 is a strong contributing element of the March Field Historic District, helping to anchor the recreational sector of the base. This sector includes four contributing buildings, all designed to serve the recreational and social needs of the hundreds of personnel stationed at the base. Although each of these four buildings is modified to one degree or another, they retain sufficient integrity -- individually and as a group -- to contribute to this historic district.

3. Building Description/Condition

Description: Building 466, the original base exchange, is a large board-formed concrete building with a Mission-tiled, wood framed, central gambrel roof (Photograph 9.77). As originally constructed, it included a basement, with heavy wooden floor framing (2 x 12's at 16" supported by girders fabricated of four full-dimension 2 x 16's). The focal point and entry was composed of a five-bay porch, with rectangular openings. The porch is bracketed by symmetrical enclosed bays at either side, each with a large steel casement window within a decorative surround. The building was modified in 1941 through construction of major stuccoed hollow clay tile wings at either side of the original, spanned by a bow-string truss, and by the enclosure of three of the five open porch bays. It was further enlarged at some point after 1941 with construction of a flat-roofed rear annex (Photograph 9.78). While much modified, Building 466 retains sufficient integrity to be a contributing element of the historic district.

The interior of the building is altered almost entirely. Two interior features remain from the original design. An original stairway provides access to the basement, offering a glimpse of the design intent for the interior of the building. A second feature is the exposed floor framing for the first story, seen as the ceiling for the basement. The impressive concrete work is the only visible clue to the structural system used in this building.

General Condition: The building is in reasonably good condition but shows the effects of frequent major alterations. On the exterior, original windows are a rarity and the porch infill seriously degrades the architectural composition. On the northeast side, there appears to be numerous applications of mastic at the base of the building, indicating remedial activity for what could be a major leakage problem. There is spalling of the plaster near the roof at the joint between the original building and the addition built to the northeast, also evidence of water infiltration, this time probably from failed parapet flashing. Inside, above the ceiling, water streaks down the "prerenovation" walls indicate other leaks, this time from behind the entrance porch parapet.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Entry porch with simple cornice line * Decorative window compositions flanking the porch (the right-hand composition is original, the left-hand windows altered) * The few remaining original steel casement windows * Board-formed concrete walls * Stuccoed hollow clay tile walls * Original copper gutters and downspouts	* Original wide stairway to basement * Original exposed floor framing and structure in basement

Non-Contributing Elements

Exterior	Interior
* Three infilled bays at entry porch * Inappropriate replacement windows * Infilled windows * Inappropriate replacement doors * Flat-roofed additions at the rear * Roof-mounted equipment * Metal, shed-roofed back porch	* The entire interior, from carpeted floors to suspended acoustical ceiling

5. Maintenance Considerations

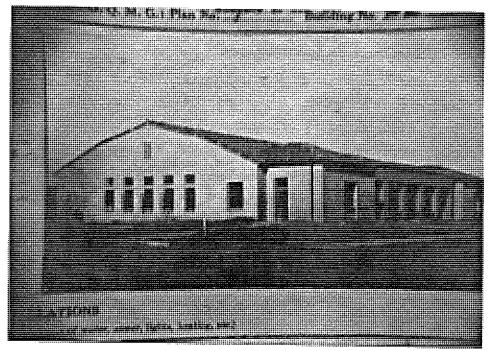
There is evidence of long-term leakage problems. This is not unusual in situations where a building was constructed in segments, and in situations where a great deal of equipment is on the roof. This building suffers both, requiring frequent and thorough inspections.

The condition of the gutters and downspouts should also be checked. At the north corner of the building, a major section of downspout is missing (**Photograph 9.82**). Additionally, along the northeast side particularly, the downspouts should be made to extend below the top of the curb, to minimize standing water where the mastic shows evidence of water intrusion.

6. Possible Restoration/Enhancement Measures

There are two significant negative impacts on the otherwise handsome facade of this building: First is the infill of the 5-bay porch. A heavy price in aesthetics has been paid for a very small increase in space. Future planning for this building should include removal of this major intrusion, and efforts to restore the original geometry of the porch as well as the entry doors. Second would be the restoration of the badly altered windows to the left of the entry. Fortunately, industrial steel windows are again being manufactured, right in southern California, and custom work is routinely done. The pattern for the restoration is on the right side of the entry. Here, as elsewhere, the simple decorative elements might show to advantage with a subtle change in color.

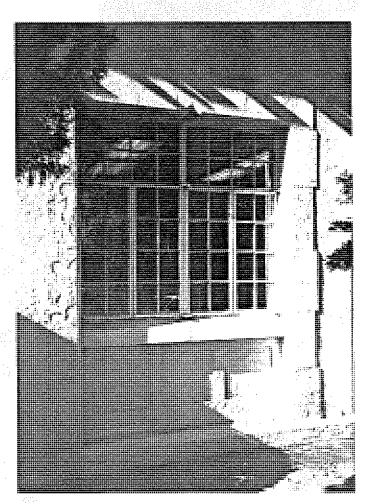
Selected Photograph of Building Detail



9.77 General view of Base Exchange, 1933.

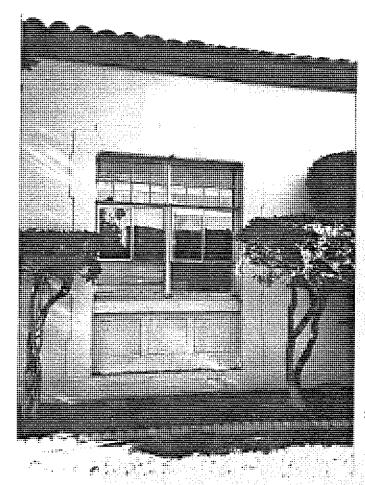


9.78 Flat roof addition and roof mounted equipment.



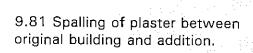
9.79 Original windows.

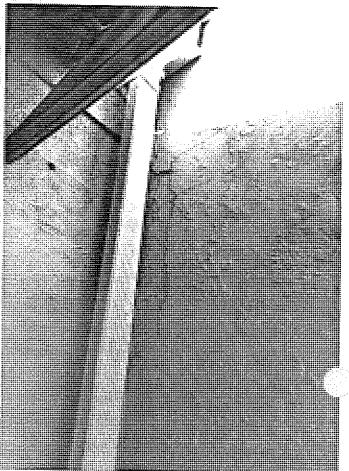
Selected Photographs of Building Detail



9.80 Inappropriate replacement windows.

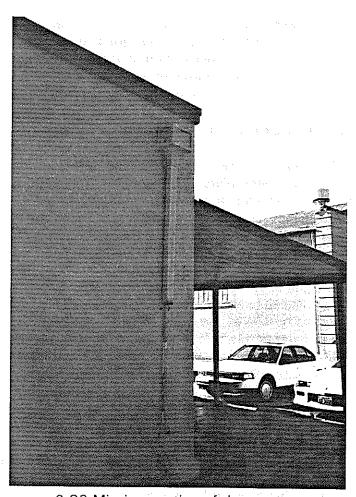
Building: 466





Selected Photograph of Building Detail

Building: 466



9.82 Missing section of downspout.

Building No.: 467 Historical Use: Base Theater

Building: 467

Date Constructed: 1933 Current Use: Vacant

Area: 5,929 sq. ft.

2. Historical and Architectural Significance

Building 467 is a strong, and largely intact, contributing element of the March Field Historic District, helping to anchor the recreational sector of the base. This sector includes four contributing buildings, all designed to serve the recreational and social needs of the hundreds of personnel stationed at the base. Although each of these four buildings is modified to one degree or another, they retain sufficient integrity—individually and as a group—to contribute to this historic district.

3. Building Description/Condition

Description: Building 467, the original base theater, is a reinforced concrete building with a gabled roof and large piers at the corners. Its height is the equivalent of three stories, although it includes a smaller, two-story entry pavilion, and a one-story addition at the rear that records show was erected with the original, by change order. The latter appears to be hollow clay block, stucco covered. The central theater space is constructed of poured-in-place concrete, placed in special forms which produced a strong horizontal indentation every 10 inches or so. The heavy corner piers are also poured-in-place, against vertical boards tightly joined. The entry pavilion is significantly more decorative. Stucco over concrete or hollow clay tiles form the walls, with heavily modelled decorative quoins at the front corners. A highly decorative Mission Revival curvilinear parapet crests this two-story element, with a Palladian motif window in a decorative surround at the second floor. Across the first floor facade is a 5-bay roundarched loggia, the outer two infilled with round-topped doors which are similar to the original. The three central bays open to a shallow porch, with a tile-wainscoted ticket booth flanked by a pair of glazed double entry doors (Photograph 9.83). Access to the interior was not provided, however in the lobby could be seen what appear to be additional original doors as well as original lighting fixtures on the wall and at the ceiling. The building retains a very high degree of integrity (Photograph 9.85).

General Condition: This building has been closed for some time, because of asbestos hazard. At the exterior, some of the major emergency exiting doors show distress at their lower levels, from weathering. At the north corner of the building, there is no downspout diverter. There is concern for interior fixtures and finishes that may degrade or may be otherwise lost because the building is essentially abandoned.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* The total entry facade is a major and irreplaceable historic element: Curvilinear parapet; Quoins; Palladian window and decorative surround; Entry loggia; Round-top doors * Ticket booth, including glass, framework, and tile wainscot * Entrance doors * Original steel casement windows * Horizontal and vertical textures of main hall * Copper gutters and downspouts * Recess in high gable wall (faux vent?)	* French and other original doors * Lighting fixtures * (It is likely that much more of the original remains in place; JRP was denied access due to asbestos-related closure.)

Non-Contributing Elements

	Exterior	Interior
* None		* None observed

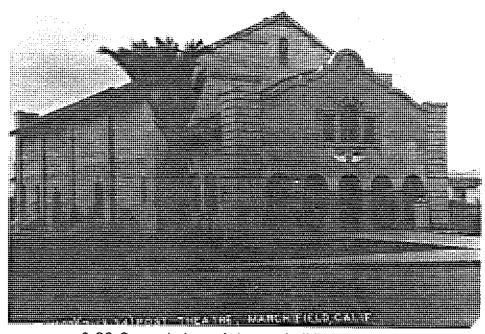
5. Maintenance Considerations

The exterior appears to be well maintained, except for the weathered exiting doors and a lack of downspout diverter at the building's north corner. Vacant buildings degrade much more rapidly than occupied ones, and because of the great amount of original historic fabric still extant at this theater, and the likelihood of much original historic fabric within, the building warrants a high level of concern and a high priority to put it back into operation.

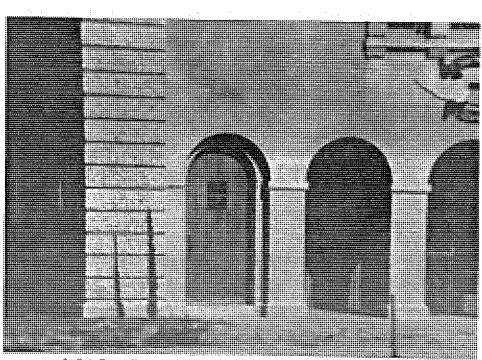
Asbestos removal or encapsulation operations should be undertaken with great care to protect historic materials and character-defining features. Buildings of this vintage rarely contain asbestos other than as pipe insulation. Encapsulation of the insulation is usually a simple procedure. Perhaps the asbestos is contained in a later acoustical treatment which poses a higher risk but can be successfully removed.

6. Possible Restoration/Enhancement Measures

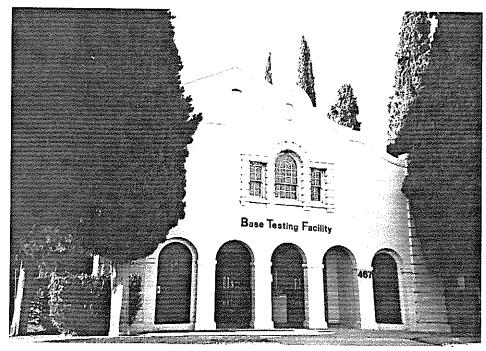
Because of its high level of integrity, there is little to do here other than to scrupulously protect what still remains.



9.83 General view of theater building, 1934.



9.84 Detail of original door on outer bay of loggia.



9.85 General view of theater facade, 1993.

Building No.: 470 Historical Use: Headquarters
Date Constructed: 1929 Current Use: Headquarters

Building: 470

Area: 19,317 sq. ft.

2. Historical and Architectural Significance

Building 470 is a key contributing element of the March Field Historic District from historical as well as architectural perspectives. It was and is the headquarters building for the base. As a key functional structure, it was prominently sited at the end of the parade ground and adjacent to the flightline. It is also one of the most handsome buildings on the base and an indispensable element of the historic district.

3. Building Description/Condition

Building 470, the original base headquarters, is a two-story over basement, board-formed, hollow wall, reinforced concrete building with a woodframed, mission-tile covered roof. It features a wide central segment, its ridge parallel to Graeber Street, flanked by shallow front-gabled returns at the ends of the building's principal facade (Photograph 9.86). The rear facade is a hip-roofed composition with a large, central, five-sided, first story bay supporting a second floor balcony (Photograph 9.88). Completed in 1929, it was one of the first buildings constructed after March Field was opened. As originally constructed, it featured an open-air observation deck, centered on the roof of the building. In 1940, the flight observation deck was enclosed to serve as a control tower. Appropriate to its role, the headquarters building is one of the most interesting and sophisticated buildings at the base. Its Mission Revival character is defined by its general form, tile roof, and cast stone doorway surround. The building originally had wooden casement windows (Photograph 9.89). These have been replaced with steel casements on the second story, joined by sympathetic aluminum casements on the first. A significant number of windows on the second floor are blocked, and the building's entry doors are altered. The setting as well as some portion of the building's integrity are diminished, however, by a large concrete block addition on the southeast. This addition, while largely freestanding, connects with the 1929 building at one side (Photograph 9.92). Despite this intrusive addition, Building 470 is a key structure within the March Field Historic District.

General Condition: The building is very well maintained, with only one exception: The southwest side of the small concrete porch at the northwest end of the building is badly discolored and spalling from rusting reinforcing steel within.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Board-formed concrete walls * "Control tower" * Two-story decorative cast stone surround at main entrance * Original windows (where they occur) * Central bay and balcony at flight-line facade * Long paved ramp to basement, flight-line facade * Wide main entrance stairs and railing * Copper gutters and downspouts	* Entrance lobby * Central corridor * Original doorways (identified by flush plaster return at jamb) * Original 4' wide wood panelled door to attic from upstairs hall

Non-Contributing Elements

Exterior	Interior
* Infilled windows * Concrete block addition to the southeast * Replacement aluminum main entrance doors with a large utilitarian light fixture centered where a transom once existed * Glass slab windows in the central bay facing the flight line * Porches, stairs and railings deprived of their reason to exist, on the flight line elevation * Aluminum replacement windows * Replacement doors	* Suspended ceilings * Contemporary lighting fixtures * Replacement doors * Carpeted corridors

5. Maintenance Considerations

Apart from the spalling concrete at the northeast porch, the building is exceptionally well maintained. No other problems are apparent.

6. Possible Restoration/Enhancement Measures

The handsome main entrance surround is shown in earlier photos to be several shades lighter than the surrounding walls (Photograph 9.87). Removal of the paint from the cast stone would be clearly appropriate. Otherwise, a subtle change of paint shading would also enhance this noteworthy decorative element.

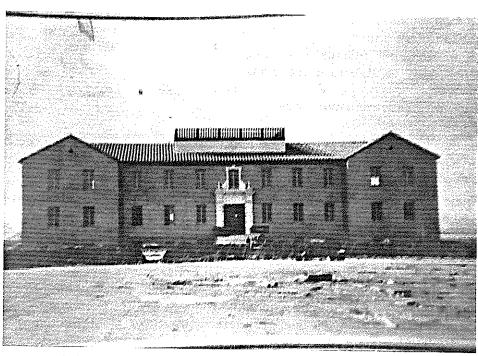
The historic composition suffers from the utilitarian character of the existing main entrance door and the light fixture poised immediately over it, in the transom space (Photograph 9.90). Future planning should include either full-height doors or the re-

introduction of a transom. From the Quartermaster documents, it appears that flanking light fixtures were never there, although the entrance area should be examined for evidence thereof. A solution for lighting the area without altering the historic facade would be a pair of free-standing, post-mounted fixtures flanking the stairs.

The blockage of so many windows has posed a problem with the strong symmetry of this resource. And while darkening the infill panel properly preserves the rhythm of the composition, the location of the infill, flush with the outer edge of the wall, does not convey a perception of genuine windows. This is the likely reason for the darkened window recesses -- it produces a greater level of consistency of perception of the openings, both real and infilled. Yet a far better solution would be to restore the windows to a consistent geometry matching the original, providing whatever security is required behind them (Photograph 9.91).

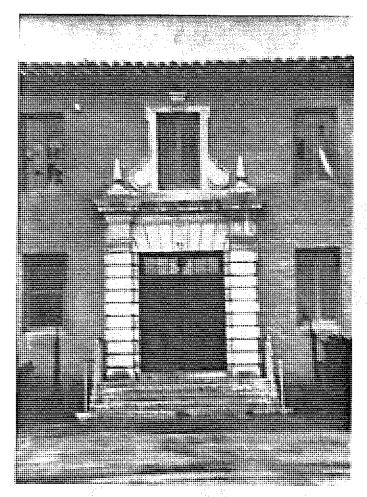
Someday, perhaps, the concrete block addition may be removed. Until then, a very practical way to decrease its visibility is to paint it a darker color and let vines grow over it.

Selected Photograph of Building Detail



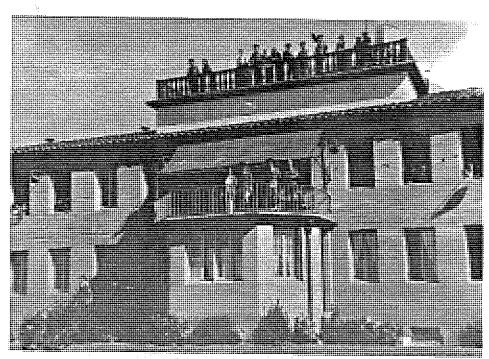
9.86 General view of Headquarters building, 1929.

Selected Photographs of Building Detail

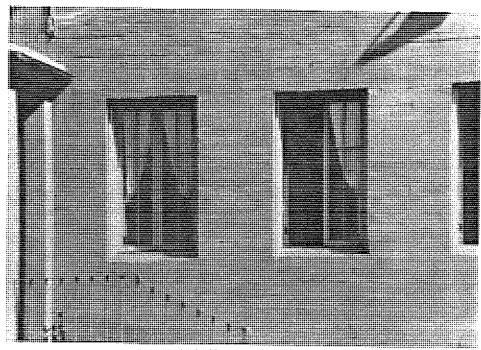


9.87 Decorative cast stone surround at entrance, 1929.

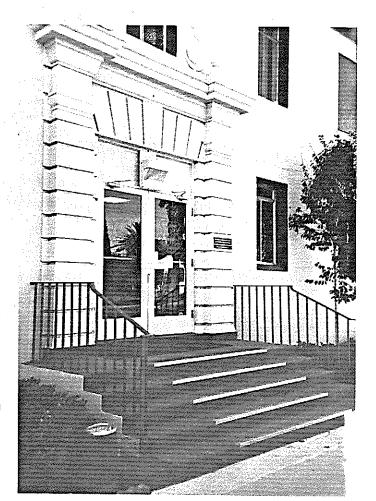
Building: 470



9.88 Rear elevation, facing flightline.

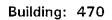


9.89 Original casement windows.



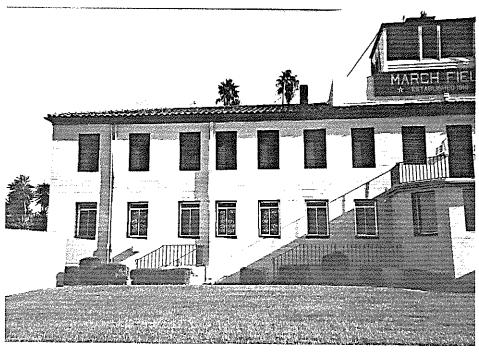
9.90 Replacement aluminum main entrance doors.

Selected Photographs of Building Detail





9.91 Infill of second story windows on flightline.



9.92 Concrete block addition.

Building No.: 472 Historical Use: Utility Vault Date Constructed: 1925 Current Use: Utility Vault

Building: 472

Area: 882 sq. ft.

2. Historical and Architectural Significance

Building 472 is a small contributing element of the March Field Historic District. It is a utility vault, constructed with the original configuration of the new post WWI March Field. As such, it is the oldest of the permanent buildings within the historic district. A minor utilitarian building, it is nonetheless a contributor within this historic district.

3. Building Description/Condition

Description: Building 472 is a one-story 882 sf, board-formed, reinforced concrete building with a mission-tiled gable roof. Like a number of the housing units, the triangle formed by the gable is finished with stucco over wood framing, and contains a louvered vent. There is no evidence of the building ever having gutters or downspouts (Photograph 9.93). The ceiling of the vault is poured-in-place concrete, and both walls and ceiling remain unpainted (Photograph 9.94). The doors, the lighting and much of the equipment appear to be original. Because of this, it is an important contributor to the historic district.

General Condition: Apart from some dislodged and slipped tiles, the building appears to be in original, and very good condition.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Mission-tile roof * Board-formed concrete walls * Original metal doors * Rafter tails * Original fan/fan housing on northeast wall * Original attic vents	* Unpainted concrete walls and ceiling * Original lighting fixtures * Original equipment

Non-Contributing Elements

Exterior	Interior
* None	* Contemporary equipment

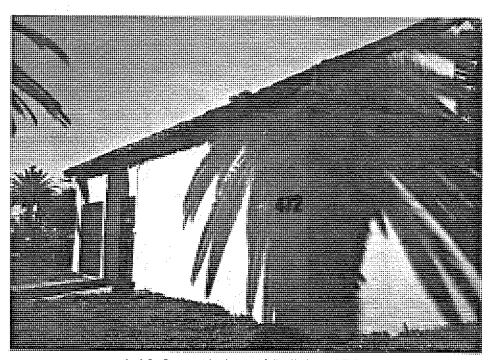
5. Maintenance Considerations

Like most of the buildings within the historic district, the roof tiles require some attention.

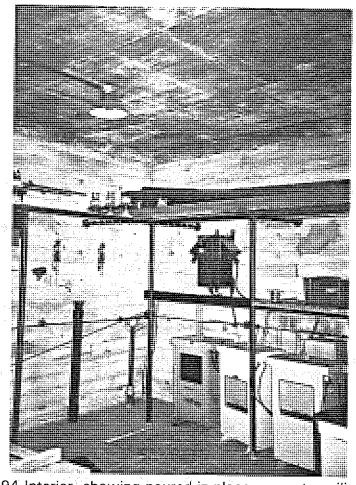
6. Possible Restoration/Enhancement Measures

The appearance of this building, other than the exterior paint, is just as it was when constructed.

Selected Photograph of Building Detail



9.93 General view of Building 472.



9.94 Interior, showing poured-in-place concrete ceiling.

Building No.: 479 Historical Use: Lumber Shed

Building: 479

Date Constructed: 1938 Current Use: Storage & Minor Maintenance

Area: 2,194 sq. ft.

2. Historical and Architectural Significance

Building 479 is important as a specialized industrial building from the period of significance for the March Field Historic District. It and adjacent Building 405 were built in 1938 to serve as a lumber shed and salvage yard. These utilitarian buildings were designed in the essential Mission Revival motif of the historic district.

3. Building Description/Condition

Description: Building 479 consists of a two-story reinforced concrete frame with concrete-framed shed-roofed extensions to the east and west. The concrete frame is infilled with board-formed concrete in some locations, plywood over wood framing in other locations, and left open in still others. The taller central section has three bays and is open to the south. An early photo shows windows across the front at the western bay of the second level. Evidence of a stair to the upper level of this section still exists on the west wing. The stairs provided access to a storage mezzanine and perhaps an office in the westernmost bay (Photograph 9.95). The two-story section now has an open south face (Photograph 9.96). The central building and both wings are roofed with Mission-tile. There remains one or two small original steel horizontal-pivoting windows. A small non-contributing addition has been built on the front of the eastern shed extension.

General Condition: The building appears somewhat neglected. The rain gutters and downspouts are in particularly poor condition, and the shed-roofed extensions to the east and west appear virtually abandoned except for a small office at the west, whose original windows have been replaced with clear rigid plastic sheets (**Photograph 9.97**).

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior
* Board form concrete * Mission tile	*

Non-Contributing Elements

Exterior	Interior
* Removal of stairs * Removal of wall at western second level bay	*
Removal of storage mezzanine Addition on shed-roof extension	

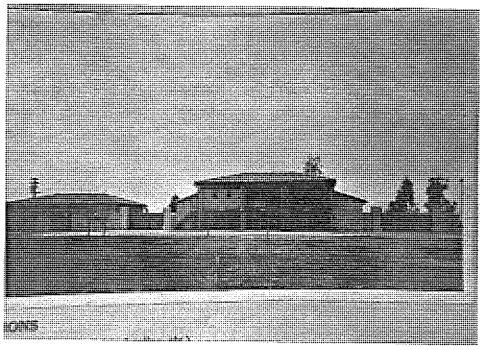
5. Maintenance Considerations

Gutters, downspouts and diverters all need repair and replacement. Some original gutter brackets remain to give evidence of the original gutters. The small eastern segment of the building appears abandoned, and is deteriorating.

6. Possible Restoration/Enhancement Measures

The building appears to have undergone a number of remodellings. It is difficult to say just how it should appear on the interior of the central section. However, preservation of the Mission-tile roof and the board-formed concrete, together with repair and replacement of the windows, gutters and downspouts will retain for the building its status as a contributor.

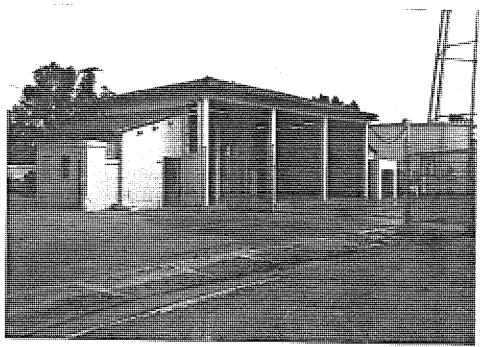
Selected Photograph of Building Detail



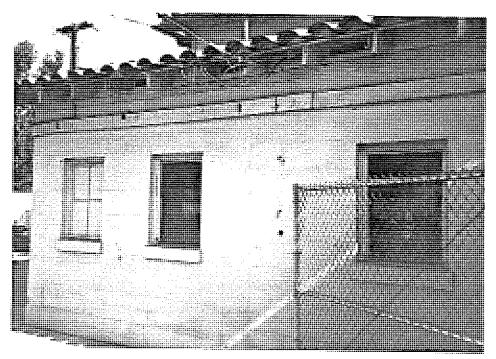
9.95 General view of lumber shed, 1938.

Selected Photographs of Building Detail

Building: 479



9.96 General view of Building 479, 1993.



9.97 Inappropriate plastic replacement windows.

Building No.: 488 Historical Use: Flagpole Date Constructed: 1933 Current Use: Flagpole

Building: 488

Area: N/A

2. Historical and Architectural Significance

Building 488 is a small contributing element of the March Field Historic District. It is a flagpole, initially centered on and immediately in front of the headquarters building. It was installed in 1933, and relocated after the Vietnam War; however it remains a contributor to the March Field Historic District.

3. Building Description/Condition

Description: Building 488 is an 85' high metal flagpole. After the Vietnam war, the flagpole was relocated to the western corner of the Parade Ground where it is the focus of a small precinct memorializing those from March Field who lost their lives in the service of their country.

General Condition: The condition of the pole and its precinct is very good.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements: Flagpole

Maintenance Considerations

The pole appears to be well maintained.

6. Possible Restoration/Enhancement Measures

There is a bit of awkwardness associated with this important focal point being placed off axis in such a strong axial setting. Long range planning should consider the relocation of both pole and memorial precinct back to the central axis, whether at the Headquarters Building, the Parade Ground or the original Entrance to March Field.

Building No.: 497 Historical Use: Water Treatment Plant
Date Constructed: 1931 Current Use: Water Treatment Plant

Area: 92 sq. ft.

2. Historical and Architectural Significance

Building 497 is a small contributing element of the March Field Historic District. Constructed in 1931, it is a treatment plant for water for the swimming pool. A minor utilitarian building, it is nonetheless a modest contributor within this historic district.

Building: 497

3. Building Description/Condition

Description: Building 497 is a small Mission-tile roofed, stuccoed hollow clay tile or block walled building of less than 100 sq.ft. A 4' x 8' concrete block, shed-roofed addition exists to the south. At the west is a door which appears to be original, and there is an original four-light, wood sash window.

General Condition: The condition of the building appears to be excellent, except for some careless overspray of paint on the roofing tiles. There apparently have never been rain gutters on this tiny building.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements: Mission tile roof, hollow clay tile walls.

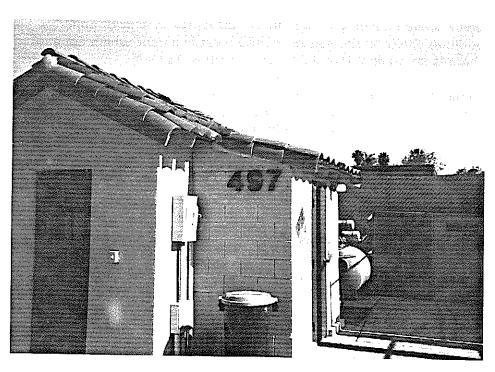
Non-Contributing Elements: Concrete block addition (Photograph 9.98).

5. Maintenance Considerations

Building appears to be well maintained.

6. Possible Restoration/Enhancement Measures

None.



9.98 Concrete block addition.

10. Historic Landscape

Landscapes Treated in this Section (Identified by Streetscapes):

Baucom Avenue Streetscape
Gilley Streetscape
Adams Avenue Streetscape
"L" Streetscape
"M" Streetscape
"B" Streetscape
"A" Streetscape
Plummer Avenue Streetscape
DeKay Avenue Streetscape
Graeber Streetscape

10.1 General comments on the historic landscape

March Field was a thoroughly planned development, with all aspects of this new "city" taken into account -- architecture, transportation, landscape architecture. Because the plan was so comprehensive, some landscape elements often overlooked comprise significant elements within this historic district, including roads, plantings, and street furniture.

The road system at March Field is inseparable from the overall base design because the roads are the principal elements defining the geometrically complex triangular plan. Clearly, the road system retains integrity of location. The road system also generally retains integrity of design, materials, and workmanship. As originally built, streets at March Field were concrete. Many of the streets retain their original concrete design and a great deal of original concrete, although all roads have been patched and repaired. As a general rule, streets are concrete within the officers' quarters sector and asphalt/concrete elsewhere. Sidewalks also constitute an important part of the transportation network of this base in that a great deal of internal movement of personnel is by foot. The sidewalk system within the historic district was installed at the same time as the roads; indeed it was part of the same contract. Although many have been patched and repaired, the sidewalks retain a high degree of integrity.

Another basic infrastructural element at the March Field Historic District is a stone-lined drainage canal, which extends along Meyer and Riverside Drives, at the northern and eastern perimeters of the historic district. This canal was installed in 1942 by Works Progress Administration workers. The canal is faced in split granite in a heavy concrete mortar. It should be noted that the canal extends far beyond the boundaries of this historic district. The canal contributes to the historic district, although only the lengths of canal within the boundaries of this historic district are treated as contributing to the historic district. Several recently constructed concrete bridges cross the canal along Meyer Drive. Although they are skillfully designed to mimic the architecture of historic concrete walls within the historic district, they do not contribute to the significance of this property.

The March Field Historic District includes many miscellaneous structures which are sometimes called "street furniture." Only one of these -- <u>Building 488</u>, the base flag pole -- carries a building number. The flagpole, built in 1933, is a copper-bearing tubular steel pipe, 85' in height. It was originally located in the southwesterly parade ground but has been relocated to the southwest corner of the northerly parade ground. The flagpole contributes to this historic district. All other structural landscaping features -- stop signs, street lamps, freestanding signs with building numbers, and so forth -- were installed after 1945 and do not

contribute to the historic district. The base also includes a number of historical interpretive signs which identify prior building uses, significant events, and so forth. These signs, while adding to the historical experience of visiting the base, are of very recent origins and do not contribute to the historic district.

Finally, the base includes very mature plantings and lawn areas which add to the sense of time and place for this historic district. The landscape (landscaping) of March Field Historic District is best characterized as one of palm, pepper, and eucalyptus tree lined streets, large flat open lawns with occasional shade trees, and buildings with manicured foundation plantings. With the exception of the somewhat formal street tree layout, a grid of deciduous trees in the park space to the south of the officers club, and the lawns that cover most of the entire open space network of the base, it appears that the majority of the landscape has grown over time with many individuals contributing plants to their immediate surroundings. All this seems to have evolved without the direction of a known overall landscape plan. Much of the base, particularly the residential areas, resembles an English park more than a Spanish plaza. There is little to connect the style of the architecture (Mission Revival) with the style of the landscape except the palms & pepper trees used to mark street edges, the garden walls inn the residential district, and the red tile 9"x 9" paver tiles in the residential patios. No native desert landscape has been preserved in the historic area.

If we think of Mission or Spanish style of landscape, we usually visualize a drier landscape of drought tolerant plant materials, shade trees, with lawn used only sparingly, if at all, in a courtyard or plaza. However, the landscape of the historic district is (was) fairly consistent with the southern California gardens of the time, made possible by the availability of water for landscape irrigation purposes, and the use of permanent underground landscape sprinklers. Photographs from the 1930's, soon after the completion of much of the historic district, show lawns covering almost the complete base grounds. These photos also reveal trees planted along the streets of the "Green Acres" area (probably the palm trees), a row of trees crossing the parade ground (either palms, poplars, or Italian cypress), and a few scattered trees lining the north edge of the old 1918 flight line (possibly pepper or olive trees.) Although the landscape is not consistent with the Mission Revival style of architecture, the landscape scheme is appropriate to this historic resource because it closely approximates the landscaping that has prevailed since the early 1930s.

Myron Hunt, the Southern California architect who consulted with the Air Corps on the design of March Field, was known to have worked with several landscape architects during the time he was designing many structures for the base. These included the Olmstead Brothers (Albert and Frederick II, sons of the great park planner) from New York, and Florence Yoch, Lucile Council, and Paul Thiene, all from southern California. However, there is no documentation to connect any landscape architect or designer with the layout of the plantings of the base. Instead, credit for designing and planning most of the landscape of the period goes to Lt. Donald Stitt of the Army Air Corps who was appointed officer in charge of the landscaping project from 1927 to 1931. Stitt propagated many of the original plant material in a greenhouse he erected on March AFB. Apparently Lt. Stitt had some background in landscape design and he later was transferred to Fort Sill and Wheeler Field to landscape those Air Corps bases.

10.2 Contributing and Non-Contributing Landscape Elements

As noted above, the road network, sidewalks, and curbing contribute to the significance of the district because they largely define the layout of the geometrically complex triangular site plan. Contributing structures and objects are few, but among the listed properties are the stone lined canal on the northern perimeter of the historic district and the flagpole in the parade ground.

It needs to be stressed that no inventory of the landscape within the historic distric has been completed, therefore to all enumerate contributing and non-contributing landscape elements (plantings and hardscape) is not possible at this time. Some general comments, however, are appropriate. Many of the larger trees, particularly the palms, Italian cypress, poplars, and cedars, are very mature and surely date the period of historic significance. Shrubs, hedges and lower plantings could be very old, but this would be hard to determine because most have been pruned severely over the years. A careful study of old photographs in combination with an intensive field survey might resolve many outstanding issues related to the age and appropriateness of the current landscape.

The base includes vast lawn areas that contribute to the sense of time and place in the historic district as much as the mature trees and shrubs. The vast open lawn areas appear to be bermuda grass, which may be from the original planting. This type of lawn is very fast growing and very invasive and may have introduced itself in other parts of the base. Some new lawns have been installed in some areas and these are of the tall fescue varieties.

The landscape has been dotted with many *additions* over the years that are not in keeping (or were not present) during the historic period. Examples of these "additions" include ground mounted air conditioners, slump stone walls, chain link fences, new garden courtyard gates, concrete block trash enclosures, redwood lattice fences and wall toppings, and wine barrel planters, and paving of the parade ground. Although these items add to the personal comfort of the base & residential population, and allows some individual expression in the garden areas, these "additions" may not be appropriate for maintaining the appropriate sense of time and place for the historic district.

10.3 General Maintenance and Restoration Considerations

Below are some general suggestions for helping to maintain the integrity of the landscape in the March Field Historic District. It is important to re-emphasize that no systemmatic study has been undertaken to date to inventory the existing landscape or evaluate its various components as contributing or non-contributing elements of the historic district. The discussion of maintenance considerations should be viewed as preliminary recommendations.

10.3.1. Collect and Retain Landscape Plans and Photographs

a. Maintaining a file of historic photographs/plans and current landscape projects will provide an important archive for recording changes to the historic landscape and assessing the appropriateness of new plantings.

10.3.2. Retain Landscape Style and Preserve Context

- b. The style of the landscape at March Field is unique in the fact that the plan for the grounds are very formal in layout with the use of typical Southern California warm inland plants. Rows of soldiered palms, peppers, cedars, and other trees mark the streets. This is its style. It is essential to maintain the health of these street trees.
- c. Resist the urge to make the historic district look other than what it is -- a military installation. The grounds in the public areas of the base should not be "improved" by addition of flowering gardens with brick lawn edges.

- d. Perimeter walls within the district should be consistent in design and materials with the originals located at the historic main entrance and near Building 406 at the northwest corner of the historic district.
- e. Garden walls should be concrete or plastered like the originals. No lattice should be added to the top of them.
- f. Do not lose the *context* in which the buildings and landscape coexist. Buildings and landscaping need to support each other. They have an aesthetic and a functional relationship. If one changes in a significant way, it may have tremendous impact on the other. For example, prohibit paving of major lawn areas, such as the parade ground.

10.3.3 Maintain Integrity in Landscape Details

The details are the parts that make up the Style and Context. Without them, there is no image of what the landscape is made of. Such details as wall design, paving, and plant materials collectively create a sense of time and place.

- a. Plants (trees, shrubs, and lawn). Use, whenever possible, plant materials that were probably available from local nurseries during the historic period. This is particularly important with trees as they determine much of the character of the open spaces. If a tree has to be removed because of disease, it should be replaced with the same tree if possible, unless the original planting location was not chosen carefully or the current location presents some threat to the health, safety, or welfare of the base residents. This also holds true for shrubs.
- b. Lawns should be maintained at current locations and should be restored where they played a prominent part in the visual and physical quality of the open space network.
- c. In recent years a number of walls have been built in the historic area with more contemporary building materials. These include concrete block, slump stone, and chain link. Any new walls should match the style, look, materials, and colors of the old concrete and plaster walls from the historic period. Chain link fences serve a very practical purpose in the NCO residential area and they are economical. However, they are intrusive elements in the historic district. Their construction should be carefully controlled, and, if necessary to protect children and pets, they should be screened with shrubbery or vines wherever visible in important viewsheds.
- d. Gravel mulch. Water conservation goals may preclude planting all landscape areas. Where appropriate, gravel mulch can be used, such as in areas not critical to the visual quality of the historic area (small planter beds in the back of buildings, edges of minor roads, and fenced in areas not seen by the public). Some areas have already been graveled, however, at least four different gravel mulches are currently being used. One color and size of gravel ought to be used throughout the historic district.
- e. Modern Technologies, e.g. Air Conditioners. Apparatus such as air conditioners make life comfortable in Southern California and are not likely to disappear. However, they should be located in places where they are the least visible. If they are in highly visible locations they they should be screened with either plant materials or low walls whose design is from the historic period.

f. Courtyard gates. There are many courtyard gates in use today throughout the historic district. Old photographs indicate that there was probably some variation among these gates from the outset. Some had sawtooth tops, others were straight, but all the original gates were very low (lower than the height of the adjacent wall) wooden gates with vertical planks and mounted on heavy cast iron or wrought iron hinges. Any new gates should follow this general design criteria.

1. Basic Landscape Data

Baucom Avenue Streetscape

Location: Green Acres (Officers' Housing) and Parade Ground Historical Uses in the Area: Residential / Hospital / Social and Recreational / Administration Current Uses in the Area: Residential and Administration

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. These strong street axes also divide the field into functional sectors. One of the strongest axes is the Baucom Avenue axis, which bisects the triangle in a northeast-southwest direction. Baucom was the main ceremonial axis of the 1930s base, linking three structures: the main entrance gate at the northeast, the commanding general's residence in the center, and the headquarters building at the southwest. Between the entrance gate and the commanding general's house, Baucom Avenue is a two lane street divided by a planting strip in the center. The street is lined by homes of the highest ranking officers, including the commanding general. At the commanding general's house, the road curves to either side, dividing into two separate streets, identified as Baucom NW and Baucom SE. Heading southwest, the two Baucom Avenues define the outer limits of the parade ground. Opposite the parade ground, Baucom NW is framed by recreational buildings and a large enlisted men's barracks; Baucom SE is framed by the old hospital complex and a matching enlisted men's barracks. Baucom terminates at Graeber Street in front of the headquarters building. The streetscape in the vicinity of the parade ground is one of the most commanding historic vistas within the district.

3. Landscape Description/Condition

The Baucom Avenue streetscape is probably the most dramatic and most changing of all the streets on the base. The historic main entrance to the base at the SW corner of Riverside Drive and Meyer Drive is framed by old palms and eucalyptus. The old guard house is framed by two small Italian cypress that have been planted in the last couple of years. Much of the ground is covered with decorative gravel, which presumably has replaced old lawns. A rock monument adorns the front entry island with a commemorative plaque. Of note are the concrete perimeter wall constructed ca. 1927 and the entrance's wrought iron gates. The concrete walls bear the marks of board formed poured-in-place concrete and they are a significant part of the original design of the base.

The streetscape changes rather dramatically once you pass the guard house (Building 154) and Baucom turns into two avenues separated by a large planter island. The streets are lined with mature palms (probably planted soon after historic housing was completed), pepper trees spaced between palms; Italian cypress is spotted between palms in the island planter. The concrete walkways found on both sides of the street are original and contribute to the significance of the historic district. The age and the growth habit of these street trees, particularly the palms and the cypress, create a tunnel affect along this segment of Baucom Avenue. One senses the feeling of a grand avenue, but at an appropriate residential scale.

Approaching the rear of the commanding general's residence (Building 176), Baucom Ave curves to either side and loses its characteristic long vistas. The feel here is very much of a residential neighborhood with soldiered palm trees along the street, some large deciduous shade trees and manicured hedges are well-placed around the houses on the street. The



streets split and pass on either side of the General's house and then open onto the old parade grounds southwest of Plummer Avenue. At the east end of the parade ground on Plummer Avenue stands a row of deodar cedars which guard the Generals house. The Baucom NW streetscape is open on the parade ground side and there are buildings with foundation plantings on north side. The foundation plantings are maintained as formal hedges or closely pruned shrubs. Palms and Italian cypress are used with success to frame the buildings.

Baucom SW is open also on the parade ground side with foundation plantings in front of the old Hospital. The hospital frontage landscape provides a good example of how some plantings in the historic district have lost their original meaning. The entrance to the building can barely be seen because it has been hidden by mature plants. The foundation plantings have been pruned up so high that they block the windows in most cases, and the building foundation is now exposed.

Where Baucom crosses DeKay Avenue the streetscape changes drastically. The western half of the parade ground, once a grassy field, is now a parking lot, with new landscape plantings. Dekay is marked with rows of palms and a Vietnam era memorial. These palms are appropriate for the historic period, as evidenced in old photographs. New plantings in the parking lot to the west of Dekay are primarily Rhus sumac and gazania as a ground cover. Neither plant is commonplace within the historic district; they are probably not of the historic period. Plantings in front of the large barracks (Buildings 400 and 311) consist mostly of open lawns and a few shade trees and palms.

4. Maintenance and Restoration Considerations

Gilley Streetscape

Location: Green Acres, along the eastern boundary of the historic district Historical Uses in the Area: Residential -- NCO and Officers Housing

Current Uses in the Area: Residential

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. Gilley Street is one of the major roads that forms the eastern leg of the triangle. Four blocks in length, it serves as the main north-south access road for NCO and officers residences located between Baucom Avenue and Graeber Street.

3. Landscape Description/Condition

The Gilley streetscape is residential in nature with large open lawns and palm lined streets. The southern two blocks of the street (south of "N" St.) is reserved for NCO houses and has a much more open feel because it is not as heavily planted as the northern blocks. At the north end of Gilley, the houses are reserved for officers and the residences are generally bigger with lusher landscapes. Large shade trees dot the open lawn areas between the sidewalks and the houses. The sidewalks, as in the rest of the "Green Acres" area are set-back from the street by a five foot planter. This is where the street trees (palms and peppers) are located. Large and small ornamental shade trees dot the large open lawn areas between sidewalks and houses. Foundation plantings of low to large shrubs surround each home, some more successful in texture, balance and color than others. Many of the houses in the northern block have garden courts with low wood gates. The perimeter walls of the courtyards date to the 1930s and are contributing elements to the historic district. Many of the wood gates have been modified or replaced over the years. The original gate design is probably a saw tooth top design of 2" x 4" vertical slates and heavy iron hardware. Many variations (or modifications) can be seen throughout the neighborhood, one being where the slates have been sawn flush on top. The courtyards contain a pathway paving that is surely of significance to the historic period and the tile is the same as the paving used in the courtyard of the BOQ, Building 100.

In the NCO housing area residences are arranged in artistic groupings in harmony with the Mission style of the architecture. The arrangement of buildings forms a serpentine pattern of freestanding structures with each cluster of three structures joined by walls with arched openings that create patios at the front and rear. The garden walls are eight feet in height and originally each arched opening was fitted with a wooden gate. None of the gates remain. The walls are attached to the house structure and are finished in stucco and colored to match the house. In many cases, vines and large shrubs frame the garden opening in the walls.

The palm street trees are probably of the historic period and appear in some of the late 1930's photographs. The peppers were probably added later for a bit more shade. Many of the peppers are losing their vigor and need some attention. Most of the foundation plantings surrounding the homes were probably made sporadically by the occupants of the residences over the past sixty years. In discussions with the base maintenance personnel, it was noted that (even today) residents of "Green Acres" are allowed to make changes to their immediate surroundings under the "self-help program" if they submit a plan for approval. These plans, or proposals, are approved by a committee at Civil Engineering and Maintenance.

The plants that survive the varying maintenance procedures and the changing of one resident family to another, appear to be the hardy and low maintenance plant materials. One possible reason why not many tropical plant specimens were noted may have been the result of the freeze of December 1990. Because of the rotation of personnel in the landscape maintenance section, no one we talked to was stationed at the base at that time.

4. Maintenance and Restoration Considerations

Adams Avenue Streetscape

Location: Green Acres, along the northern boundary of the historic district Historical Uses in the Area: Residential and Social-- Officers Housing and Officers Club

Current Uses in the Area: Residential and Social

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. Adams Avenue is one of the major roads that forms the northern leg of the triangle. Only three blocks in length, it serves as the main east-west access road for officers residences located west of Baucom Avenue. The officers housing is restricted to the two blocks east of O Street. West of O Street, Adams is flanked by the Officers Club Complex and the Visiting Officers Quarters to the north and a parking lot and park to the south. Adams Avenue terminates at its west end at the Bachelor Officers' Quarters.

3. Landscape Description/Condition

The east end of Adams Street has much the same character as the north end of Gilley. Large palms trees mark the east blocks where high ranking officers live. Younger pepper trees have been planted between the palms along the street. Houses are set-back allowing for large open lawn areas and large shade trees. Again manicured foundation plantings surround the homes.

The west end of Adams street is occupied by the expansive Officers Club, and is landscaped with typical foundation plantings of no particular composition. However, of special interest is the formal grove of shade trees (a variety of elms) across Adams Street to the south of the Officers Club. This grove is quite old and many of the trees are in poor health. New elms (Ulmus sinenus) were planted in January 1992 to begin replacement of this old grove. The old grove appears to relate to the historic period, and it seems appropriate to replace dying trees with these new elms. This area, although simple, can be considered a park and is probably used for bar-b-ques and parties related to the activities of the Officers Club.

Also of visual interest is the view looking west down Adams that terminates in a central open arched portal of the old bachelor officers quarters (Building 100). This is a very strong image and was surely intentionally planned by Myron Hunt and the other designers of the historic site plan. The view through the arch reveals a Spanish style fountain in the middle of the inner courtyard of the bachelor officers' quarters.

4. Maintenance and Restoration Considerations

"L" Streetscape

Location: Green Acres, along the eastern boundary of the historic district Historical Uses in the Area: Residential -- Officers and NCO Housing

Current Uses in the Area: Residential

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. L Street is a minor access road running parallel to Gilley Street that provides access to the garages located behind NCO and Officers housing.

3. Landscape Description/Condition

"L" Street has all of the characteristics of a back alley or service road, with play and dog areas enclosed with chain link fences to the west, garages and trash enclosures at the curbs. The east edge of the street has exposed bare earth with plantings of mostly eucalyptus trees (Eucalyptus globulus). These are planted in a hedge row fashion. Oleanders, pittosporum, and photina are some of the understory plantings east of the road. Open lawns predominate the landscape between Buildings 146 through 160. Of note are the garbage enclosures which are not of historic design or material and do not date to the period of significance. Most plantings, except the eucalyptus row, seem to be randomly planted or purely functional. Utility poles are prominent on both sides of the road. The road appears to have its original concrete paving and curbings. As is true elsewhere in the residential sector, no sidewalks exist along this service road.

4. Maintenance and Restoration Considerations

"M" Streetscape

Location: Green Acres, along the northern boundary of the historic district Historical Uses in the Area: Residential and Social -- Officers Housing and Officers Club Current Uses in the Area: Residential and Social

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. M Street is a minor service road running parallel to Adams Street that provides access to the officers garages, the rear of the officers club complex, and a small tavern located on the back alley opposite the officers club.

3. Landscape Description/Condition

The "M" Streetscape is very much like that of "L" Street. This street is the service entrance to the homes on Adams street and the officers club. A mature row of Eucalyptus and occasional palms mark the north edge of the street and act as a hedge row to block the wind and noise (of Meyer Drive) and visually separate the old base from the new base functions on the north side of Meyer Drive. New plantings have been proposed for this area including adding catalpa species. The road is of concrete with curbs, but no sidewalks. Utility poles cluster the view down the street. Like "L" Street, garages for the residences are found on the outside edge.

4. Maintenance and Restoration Considerations

"B" Streetscape

Location: Green Acres, paralleling the northern boundary of the historic district Historical Uses in the Area: Residential/Social and Recreational/Industrial Current Uses in the Area: Residential/Social and Recreational/Industrial

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular form. It is defined chiefly by streets, which divide the base into a series of right triangles. B Street is the innermost east-west arterial within the historic district. It is located south of Adams Street. B Street is three blocks in length and is one of the original avenues laid out on the late 1920s site plan. At its western end it terminates at Baucom Avenue and is lined by officers housing on both sides of the street. The middle block of B Street is flanked by a park on the north and a large paved parking areas to the south. At its western end the street is flanked on the north by the BOQ and its associated recreational area. B Street terminates within the March Field industrial zone on the west.

3. Landscape Description/Condition

The "B" streetscape begins at Baucom (north of Building 137) and heads west terminating in the shop area short of Graeber Street. The eastern most block is residential in nature with plantings similar to the eastern blocks of Adams Street. The center block of "B" Street is bordered by the park like grove of elms on the north and a large non-contributing parking lot to the south. The western block contains the south side landscaping of the BOQ, now visiting officers housing (Building 100) and to the south side of the street a small park that may contain some of the oldest landscape elements on the base. Surrounding Building 439 are a grove of very old trees, some being pepper trees. A cluster of trees appears at this location on some pre-1930's photographs. It is not known if they are the same trees, but if they are the same, then they are significant and need to be protected.

4. Maintenance and Restoration Considerations

"A" Streetscape

Location: Green Acres, paralleling the eastern boundary of the historic district

Historical Uses in the Area: Residential -- Officers and NCO housing

Current Uses in the Area: Residential

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular site plan. It is defined chiefly by streets, which divide the base into a series of right triangles. A Street is the innermost north-south arterial within the historic district. It is located one block west of Gilley Street. A Street is three blocks in length connecting with Baucom Avenue on the north and Graeber Street on the south. Although it is one of the original avenues laid out on the late 1920s site plan, A Street is a minor service road. It provides access to Officers houses and garages at its northern end and the NCO houses and garages to the south. Residences line the street on both sides for most of its distance.

3. Landscape Description/Condition

The northern block of "A" Street is similar in character to the eastern block of "B" Street. Clusters of garages are found along the frontage. The two southern blocks are similar to the two south blocks of L Street. The streetscape contains few trees, no sidewalks and has the general appearance of a back alley. A Street serves as a rear access to NCO houses fronting on Gilley Street, DeKay Avenue, and U Street. The southern most block of A Street opens to a large parking lot to the west. The parking lot has recently been repaved.

4. Maintenance and Restoration Considerations

Plummer Avenue Streetscape

Location: Green Acres, forms western boundary of the Officers quarters area

Historical Uses in the Area: Residential / Hospital / Social and Religious

Current Uses in the Area: Residential / Administrative

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular layout. It is defined chiefly by streets, which divide the base into a series of right triangles. Plummer Street is the shortest and most northeastern of three roads that form the hypotenuse of triangles defined by the road network within the historic district. Plummer Street connects with B Street to the north and A Street to the south.

3. Landscape Description/Condition

The Plummer streetscape is dominated by the Base Commanders House (Building 176) which probably has the most extensive residential landscaping in the historic district. The house is surrounded by hedges and a concrete wall to the east, and foundation plantings and lawn to the west. Plummer Avenue is lined principally with deodar cedars along the parade ground, elsewhere cedars, oaks and palms also serve as street trees. Landscapes at either end of Plummer in the residential districts are typical of "Green Acres" area in general. Very mature shade trees exist between the sidewalk and the houses. The old chapel on the south-west corner of Baucom and Plummer has old oak trees that should be protected.

4. Maintenance and Restoration Considerations

Dekay Avenue Streetscape

Location: Central Parade Ground, extending southeast and northwest Historical Uses in the Area: Residential / Administrative / Recreational Current Uses in the Area: Residential / Administrative / Recreational

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular site plan. It is defined chiefly by streets, which divide the base into a series of right triangles. DeKay Avenue is the middle of three roads that form the hypotenuse of triangles defined by the road network within the historic district. DeKay Avenue runs in a northeasterly-southwesterly direction and connects with B Street to the north and A Street to the south.

3. Landscape Description/Condition

DeKay Street cuts diagonally through the heart of the historic district. The landscape varies from residential to the south, to the parade grounds in the middle, to recreational complexes and enlisted men's barracks to the north. The residential areas along Dekay at its southern end have the same character as the southern portion of "A" and "L" Streets.

The front landscaping for Building 317 has been modified from lawn to a collection of small planter boxes with roses and white rock. Although this introduction of a flowering planting bed may appeal to some, it is not in keeping with the landscaping of the historic period. The use of decorative colored rock and red concrete looped brick to define planting bed edges and sidewalks as found near Building 17 should be discouraged.

DeKay Avene bisects the old parade grounds. On the east side is an open lawn area on the west side the lawn has been repaced by a parking lot. Rows of old palm trees line DeKay Street on both sides where it passes through the parade ground. These palms may be the trees that are seen in many of the old photographs of the early 1930's. A new addition to the DeKay Streetcape in the vicinity of the parade ground is the Vietnam War Era Memorial. The memorial does not contribute to the historic district, but the nearby flagpole does.

The landscapes in front of the recreation buildings (Buildings 463 and 465) are typical foundation plantings with palms marking the corners of the facade. Again, the use of red concrete planter edges in front of the gymnasium ought to be discouraged.

4. Maintenance and Restoration Considerations

Graeber Avenue Streetscape

Location: Fronting the hangars and flightline

Historical Uses in the Area: Industrial / Administrative Current Uses in the Area: Industrial / Administrative

2. Historical Significance

The most distinctive characteristic of the March Field Historic District is its unusual triangular site plan. It is defined chiefly by streets, which divide the base into a series of right triangles. Graeber Avenue is the longest and westernmost of three roads that form the hypotenuse of triangles defined by the road network within the historic district. Graeber Avenue runs in a northeasterly-southwesterly direction and connects with Meyer Avenue to the north and Riverside Drive to the south. Historically it served as the "backdoor" into March Field and handled the bulk of the truck traffic into and out of the industrial sector of the base.

3. Landscape Description/Condition

Graeber Street is principally framed by the hangars and industrial buildings. Because of its industrial nature, landscaping along this street is quite sparse, consisting primarily of scattered street trees including peppers, eucalyptus, and palms. In front of the hangars there are small patches of lawn and minimum foundation plantings. Being a heavily trafficed area, much of the open space is paved with concrete and asphalt driveways and parking stalls.

One exception to the minimal landscaping along Graeber is found at Building 470, the Headquarters Building, where young purple leaf plums surround the building. The headquarters building is located at mid-point on Graeber Street, opposite the headquarters the view is open across the historic parade grounds. Adjacent to Greaber the parade ground has been paved over and now serves as a parking lot.

At the southern end of Graeber Street near Building 259 stands a very mature Italian stone pine. This tree should be considered significant and should be protected.

In the past few years an extensive network of slump stone walls have been erected in front of and adjacent to the hangars. These walls constitute a major intrusion of an inappropriate landscape design element into the historic district. A portion of this slumpstone wall was constructed was recently built in close proximity to the above mentioned Italian stone pine. The foundation for this new wall has probably done some damage to the tree's root system. The tree's health should be monitored.

4. Maintenance and Restoration Considerations

(see general comments)

a. Monitor health of the Italian stone pine located near Building 259.



11. Historically Significant Buildings Outside the March Field Historic District

Buildings Treated in this Section (Identified by Building Number): 641, 641A

11.1 General Comments on Integrity, Maintenance, and Restorative Measures for Historically Significant Buildings Outside the March Field Historic District

The bulk of this document addresses historic buildings within the March Field Historic District. Two buildings outside the historic district have been determined eligible for listing in the National Register of Historic Places: the Red Cross Building (Building 641) and its associated garage (Building 641A). These buildings essentially form one historic unit: the Red Cross complex which was built in 1943 and has served the base for more than half a century. The attached forms describe these two buildings and address maintenance and restoration needs for them. The buildings are in original condition, with no notable modifications from their original appearance. For this reason, no restoration projects are proposed or needed. The buildings are deteriorated, however, and in need of immediate maintenance work. Maintenance suggestions are included in the attached forms.

11.2 Other Historic Buildings Outside the March Field Historic District

In 1939, was war in Europe threatened to draw the United States into a global conflict, March Field expanded beyond the boundaries of the historic triangle. All of the buildings constructed during World War II (1939-1945) were inventoried and evaluated in a 1991 study by Patti Johnson of the US Army Corps of Engineers, Sacramento District.¹ That study determined that only two World War II era buildings were eligible for listing in the National Register -- the Red Cross Building and its associated garage (Buildings 461 and 461A).

Thus, at this time, there are no historic buildings (i.e., buildings at least 50 years old) outside the historic district, except Buildings 461 and 461A, that need to be maintained so as to preserve or restore their historic integrity.

¹ Patti Johnson, Jerry Fuentes, and Kimberly Mann, "Inventory and Evaluation of World War II Structures, March Air Force Base, Riverside, California," (US Army Corp of Engineers, Sacramento District, 1991).

.

1. Basic Building Data

Building No.: 641 Historical Use: Red Cross Building
Date Constructed: 1943 Current Use: Red Cross Building

Building: 641

Area: Approx. 1600 sq. ft.

2. Historical and Architectural Significance

The Red Cross Building and its associated garage, Building 641A, were determined to be eligible for listing in the National Register of Historic Places on an individual basis, unrelated to the March Field Historic District. The Red Cross Building is by far the most elegant of the World War II-era buildings at March AFB and is a testament to the volunteer civilian efforts which have assisted base operations since World War II. Although its Colonial Revival styling is not consistent with the Mission Revival theme for the historic district, the building is not and has never been considered in the same context as the historic complex at March Field. The two Colonial Revival buildings literally and figuratively stand on their own, more a part of the expanded base to the east than a part of the historic March Field area.

3. Building Description/Condition

Description: The Red Cross Building (Building 641) is a woodframe, side gabled Colonial Revival structure with a handsome square-columned portico extending across the facade (**Photograph 11.1**). The building is in a T-shape, with a tall side-gabled reception area facing the street and a lower rear-gabled office wing at the rear. Its most character-defining elements include the aforementioned front porch, gable returns at the side elevations, and oriel vents in the gable ends. The building is almost completely unmodified, in its interior as well as its exterior.

General Condition: The building is in fair condition. It has received years of heavy use. The exterior is severely weathered in some locations, particularly on the south and west (**Photograph 11.2**). The interior, most of it original, is shopworn but serviceable.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
 * Colonial Revival overall massing and geometry * Colonial Revival porch consisting of four square columns, cornice, and crossdiagonal geometry railing above the porch anchored by finial extensions of the columns * Greek Revival gable and gable returns * Tall, triple 18-light windows at each gable end of the front pavilion * Original double-hung windows and original doors * Oriel vents at the attic 	* Original and still unpainted Knotty Pine wood panelling in reception-class-conference room * Horizontally laid up fiber-board paneling above the wood across the ceiling, attached without visible nailing * Original doors and hardware (in most locations the door consists of a single plywood panel surround by styles and a top and bottom rail, all stained rather than painted) * Original massive wood room-divider * Original lighting fixtures * Original kitchen cabinetwork	

Non-Contributing Elements

Exterior	Interior
* Cooling equipment intruding on windows	* Contemporary fluorescent lighting

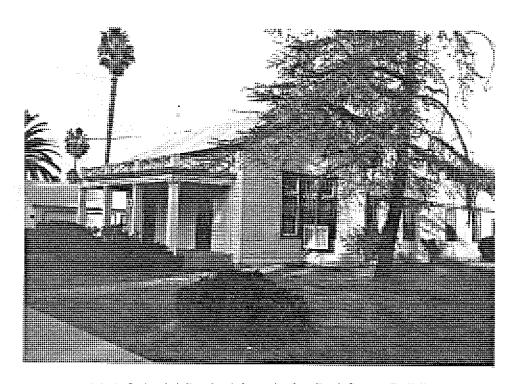
5. Maintenance Considerations

The building's exterior suffers from the lack of paint. Because of this lack, in some locations, the wood is severely weathered and some elements are beyond repair. On the west, the siding is still essentially good, although the paint is peeling. The porch, which has protected the west face, contains trim pieces which are extremely deteriorated, and the porch ceiling shows considerable evidence of long-term leakage. On the north, the wood is peeling and decay was noticed in one location. The ogee trim at the roof is deteriorated, as is the case on the east side and on the south, where the forces of the weather are clearly most severe. Because deterioration-especially of wood--progresses exponentially, it is urgent to attend to the repair, preparation and repainting of this resource.

6. Possible Restoration/Enhancement Measures

Of the buildings which undergo full-time occupancy, this building is among the most unaltered of March's historic resources--inside and out. It needs neither restoration nor enhancement, but it desperately needs repairs and replacement to the deteriorated exterior, followed by a protective coat of paint over well-prepared wood. As a minimum, repairs should be followed by the removal of loose paint by means of medium pressure water (about 200 psi at the nozzle) applied by a skilled user to prevent eroding the wood. This should be followed by touch sanding to feather out the boundary between remaining well-adhered paint and bare wood. This should be undertaken in accordance with government restrictions applicable to the removal of lead-based paint. New and bare wood should be primed prior to painting. There is no cheaper maintenance procedure than routine painting.

Selected Photograph of Building Detail



11.1 Colonial Revival facade for Red Cross Building.



11.2 Deteriorated trim at facade.

Building: 641A

1. Basic Building Data

Building No.: 641A Historical Use: Garage Date Constructed: 1943 Current Use: Storage

Area: Approx. 200 sq. ft.

2. Historical and Architectural Significance

Building 641A is a small garage built for use by staff of the adjacent Red Cross Building (Building 641). The Red Cross Building and this garage were determined to be eligible for listing in the National Register of Historic Places on an individual basis, unrelated to the March Field Historic District. The Red Cross Building is by far the most elegant of the World War II-era buildings at March AFB and is a testament to the volunteer civilian efforts which have assisted base operations since World War II. Although its Colonial Revival styling is not consistent with the Mission Revival theme for the historic district, the building is not and has never been considered in the same context as the historic complex at March Field. The two Colonial Revival buildings literally and figuratively stand on their own, more a part of the expanded base to the east than a part of the historic March Field area.

3. Building Description/Condition

Description: Building 641A is a woodframe three-car garage. It is sided in drop siding to match Building 641. It shares several character-defining features with the Red Cross Building, including gable returns (broken pediment) and an oriel vent at each gable end. The building is almost completely unmodified, retaining its original windows and, apparently, its original garage doors as well (**Photograph 11.3**).

General Condition: The garage is in fair condition, suffering from the same lack of paint as the principal building, causing significant deterioration, especially of wood trim pieces, some of which may be beyond repair. The wood structure and siding are in contact with soil, particularly at the northeast corner. This condition invites termite and rodent infestation and must be remedied.

4. Inventory of Contributing and Non-Contributing Elements

Contributing Elements

Exterior	Interior	
* Colonial Revival overall geometry and massing * Colonial Revival gable returns * 15-light window on street (west) face * Oriel vent at attic level of gable walls * Existing windows * Garage doors which match the dropsiding of the walls	* Entire interior structure appears to be original.	

Non-Contributing Elements

Exterior	Interior
* None	* None

Maintenance Considerations

Most alarming is the extension of the wood siding into soil. This needs to be immediately remedied by providing a minimum 6" concrete mow strip around the building. This strip should have steel dowels into the garage slab so that the two do not separate. The edge of the slab and the lower level of the garage framing and siding should be termite-treated before the mow strip is poured. If there is no slab, the mow strip should occur inside the building as well, in order to keep all wood a minimum of 6" clear of soil.

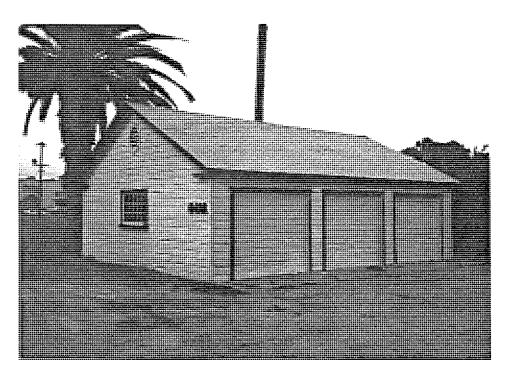
On the west face, the window and frame are pulled away from the structure. On the north face, the ogee trim and the windows and their trim are all disintegrating. At the northeast corner, the grade level is considerably raised, exacerbating all the problems of wood/soil content. The east and south show less deterioration, but all need some attention.

It appears that there are at least three layers of roofing material, which, coupled with very light roof framing, have generated a gentle "swayback" to the roof. While not structurally hazardous, less roofing material or a somewhat "beefed-up" roof structure would remedy this unsightly condition

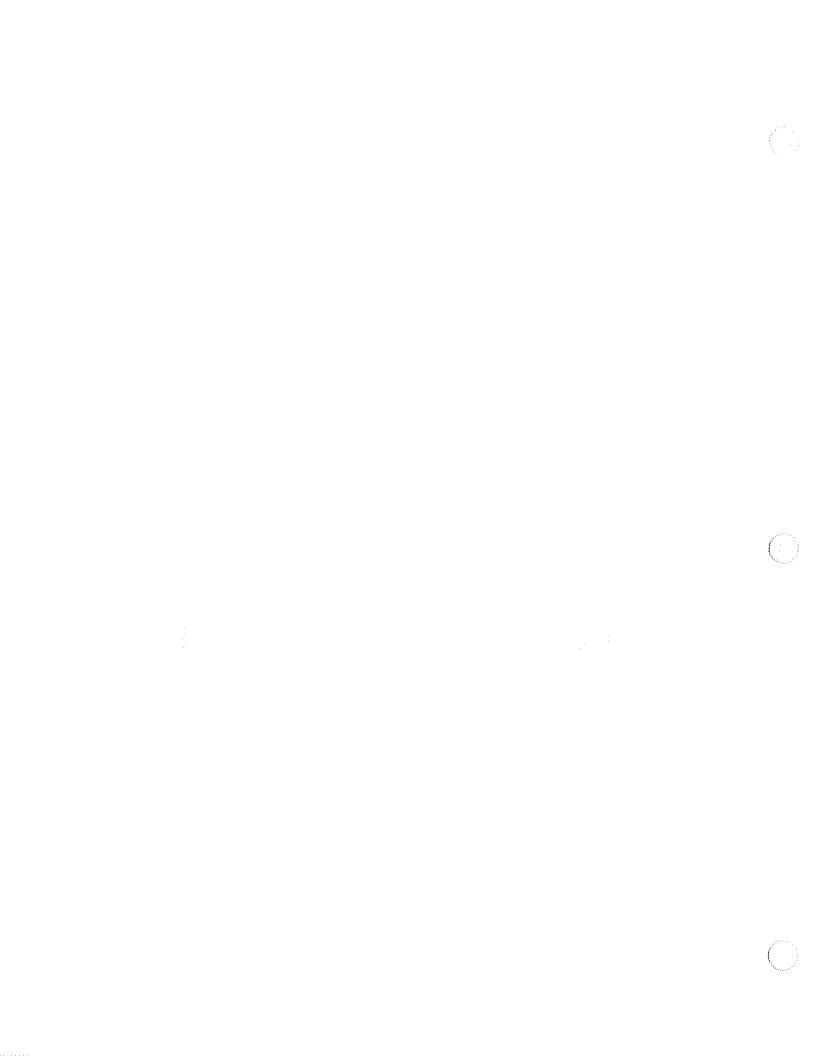
6. Possible Restoration/Enhancement Measures

This small out-building needs neither restoration nor enhancement, but it desperately needs repairs and replacement to the deteriorated exterior, followed by a protective coat of paint over well-prepared wood. As a minimum, repairs should be followed by the removal of loose paint by means of medium pressure water applied by a skilled user to prevent eroding the wood. This should be followed by touch sanding to feather out the boundary between remaining well-adhered paint and bare wood. This should be undertaken in accordance with government restrictions applicable to the removal of lead-based paint. New and bare wood should be primed prior to painting. There is no cheaper maintenance procedure than routine painting.

Selected Photograph of Building Detail



11.3 Building 641A.



12. A Checklist for Inspection and Maintenance of Exterior Architectural Elements

In maintaining historic buildings at the March Air Force Base, the overall standards are the Secretary of the Interior's *Standards for Rehabilitation*. These standards are universally accepted by all parties concerned with historic preservation issues, the National Park Service, the Advisory Council on Historic Preservation, and the California State Historic Preservation Officer. The Department of Defense and the Air Force through its Policy Directive on Environmental Quality (AFPD 32-70) has generally adopted the Secretary of Interior's Standards as the basis for judging the success or failure of its historic preservation efforts.

12.1. A Maintenance Strategy: The Ground Rules

Far more important than the problems that can be identified, are all the right decisions over the years which have retained for the nation a rich architectural treasure in the March Field Historic District. The nation owes a debt of thanks to the Air Force for its enduring stewardship of this historic resource. In acknowledgment of its fine Mission Revival architecture and its unique triangular master plan, evidence abounds of the Air Force's sensitivity to the original design intent of architect Myron Hunt and city planner George Ford, despite all the changes over all the years. The March field Historic District is a clear case of the whole being much more than the sum of its component parts.

Likewise, protection of the resource as a historic district involves much more than just running through individual checklists on how to maintain the historically significant buildings. Unlike a museum, this resource functions as a living, growing, changing entity. It must continually evolve in order to adequately fill a useful role through ongoing years. Yet, these changes must not compromise its overriding historic and architectural significance. This commitment is all the more important as the stewardship of the historic district passes on to others, or is fragmented among several entities. New changes in use, interior modifications, exterior additions (if unavoidable), even the long-term growth cycles of the vegetation -- all reflections of the flow of history -- need to accommodate the present and still respect the past. While being ever conscious of the "big picture," it is not prudent to overlook the little things. Inappropriate modifications, no matter how small, remove important historic fabric from the resource and will have a significant cumulative effect over a long period of time. Like a sausage losing a thin slice at a time until suddenly its gone, the integrity of the historic district can be lost by erosion resulting from a little compromise here, a little thoughtlessness there. This applies not only to the buildings, but to the site in general. Parallel programs of long-term landscape renewal and street and sidewalk maintenance should be developed and implemented. There are many specialists in historic preservation available to provide professional guidance with both ongoing situations and long-range planning. preservation of the District, and in recognition of the federal mandates which protect it, liaison should be maintained with these preservation specialists.

Having recognized the merit of identifying a historic district and retaining historically significant buildings at March Air Force Base through their nomination to the National Register of Historic Places, it is now essential not only to discover, but to remedy problems at the earliest opportunity. Economically, deferred maintenance only works on throw-away buildings. It is impossible to save money by neglecting problems in a building intended to endure. By the same token, the cheap or slipshod repair will ultimately be the most costly.

The secret of good maintenance is ferreting out and fixing little problems as they arise. If preventive and on-the-spot maintenance are successful, the big (expensive) problems will be

rare. The secret of finding those little problems lies in thorough and regular inspection. The inspection process can be both eased and enhanced by the willing participation of the building's residents and/or managers. They are more likely to be enthusiastic participants in the preservation process if given the opportunity to learn and to appreciate the heritage of which they are a part. Countless inner cities, neglected and decaying, have become the centers of community pride with the rediscovery of their unique historical and architectural heritage. On military reservations, too, most people welcome, and zealously protect, their opportunity to participate in the flow of history through an historic building or district.

12.2. Documentation

12.2.1. Documentation of Past Work

Comprehensive documentation of all remodel, repair and maintenance is imperative for each building listed as a "contributor" to the historic district. (The same is, of course, appropriate for all buildings.) The basic inspection and maintenance files should contain copies of the original plans (if available), plans (with dates) showing alterations, and original and subsequent photos (also dated). Whatever records exist to date should also become a part of the documentation. Hereafter, the file should be updated with each inspection report and a record kept of all maintenance, repairs and alterations, including photos (if appropriate) and specifications for materials utilized. The latter is particularly important for paints, stains, varnishes, etc., in order to insure future compatibility.

Documentation retained by March AFB for past building maintenance and repair work is good but could be improved. Original plans exist for some but not all buildings; missing plans should be located. Documentation for past work is somewhat scattered. Plans for work on housing units is stored with the housing office, BCE, and, in some cases, with the private contractor. Non-residential plans are stored generally at the BCE, although the records for work designed by the Corps of Engineers are not always stored there. A first step in improving documentation would be to centralize records to ensure that all plans pertaining to contributing buildings may be located in a "one-stop" location. The BCE is the obvious location for this centralized record-keeping.

12.2.2. Documenting Inspections and Maintenance Activities

It is recommended that March AFB develop inspection forms that are specific to the contributing buildings within the historic district. These forms should include items that are specific to the building in question in addition to items that apply to all buildings within the historic district.

The first item on any inspection form should identify whether the building is within the historic district and whether it is a contributing or non-contributing element. A possible suggestion would be to prefix or suffix a two letter designation to the names, numbers or other identifiers of all elements within the District: "HC" for a "contributor" and "HN" for a non-contributor. It is as essential to identify all those elements within the Historic District which do not contribute to the District's integrity as it is to identify the contributors. Because every action or project within the District has the potential to affect the District, the consequences of actions on both "Contributors" and "Non-contributors" must be evaluated from a historic preservation perspective. The bottom line is this: within the boundaries of the Historical or architectural integrity consistent with professional standards and the mission of the Air Force. For

this reason, within the District, what is done about signage, parking lots, landscaping, dumpsters, anything, must be weighed in the balance of historical and architectural sensitivity and integrity.

Buildings, structures, objects, or landscape elements outside the historic district that are, or may be in the future, identified as eligible for listing in the National Register as individual properties should also be clearly identified on all documentation. It might be possible to name, or number these properties using a suffix or prefix of "NR" to identify their status as National Register eligible properties. At this time only two properties fall into this category -- the Red Cross Building and its associated garage.

In addition to identifying the status of a building, the building-specific information should clarify the elements of interest in the building in question. As discussed in other sections of this report, the historic buildings within the March Field Historic District possess *contributing elements*, elements that define the architectural character of each building. These elements differ from one building to the next, although many such elements are used commonly throughout the historic district. An inspection report should specify the contributing elements of the building, to guide the inspector to pay close attention to the important elements for that building.

For example, the "Basic Building Data" for Building 420 are found on pages 8-5 through 8-8 of this report. Included on page 8-6 is a list of contributing elements for the building: plastered hollow clay blocks; industrial sash windows; decorative southeast entrance door, transom and surround; parapet; pilasters; copper gutters and downspouts; and metal fascia. These elements should be included in the inspection report for that building to guide the inspector to specific items needing particularly careful attention. A similar list could be developed for each of the building, keying into the specific contributing elements of the building in question.

In addition to the list of contributing elements, the inspection report should include all of those elements that would be inspected on any building, new or old, historic or non-historic. This list should include (at a minimum): roof; gutter and rainwater leader; exterior at grade; balconies and porches; wooden porches; doors; windows and frames; and mechanical and electrical systems. Instructions for completing inspections of these routine items are provided in section 12.3 below.

In summary, the maintenance inspection form should include three major elements: the status of the building (contributing or non-contributing and so forth); a list of contributing elements to be inspected with special care; and a standard list of architectural elements that must be inspected.

12.2.3. Instructions for Maintenance Inspections of Exterior Architectural Elements

Just how this inspection process is implemented and just how the maintenance is accomplished must rest in the hands of building managers, Air force civilian or military personnel, or outside contractors who are assigned this responsibility. Whoever is accountable for this responsibility, the watchwords should be thorough inspection and timely repair. Methods, techniques and materials vary to such a degree that a recipe for every condition would be impossible in this Maintenance Manual. The materials being dealt with are not uncommon—they are merely old. What is required is commitment and good judgment: to select from among repair alternatives those which minimize the loss of or damage to the

historic materials. The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings are an invaluable guide in that endeavor.

The instructions which follow are tailored specifically for the March Air Force Base Historic District but are based on the very comprehensive checklists found in Shirley Hanson and Nancy Hubby's valuable book *Preserving and Maintaining the Older Home*, published by McGraw-Hill. The book is an excellent and readable resource and should be a part of the installation's maintenance library. (Used by permission.)

The location of these instructions as one of the final elements in this manual is for convenience only. It would be a grave error for supervisors, inspectors or repair personnel to utilize the instructions without being familiar with the manual which accompanies them or the supplemental reading which undergirds them. The commitment of the Federal Government to the preservation of the Nation's historic resources demands that those entrusted with these resources be both knowledgeable and capable.

- 1. Roofs -- inspect semi-annually, spring and fall, and after heavy storms.
 - a. Examine the places where the roof changes pitch or direction for disintegrating materials or for gaps where water might enter.
 - b. Investigate joints where roof and walls meet for any cracks.
 - c. Look at the flashing for cracks and holes and for looseness where it joins another material.
 - d. Find out if the covering over the ridge or the hip of a roof is tight and without gaps.
 - e. Be alert for dislodged, broken or missing tiles.

While on the roof, check the ridge and hip lines to see if they are straight. Sagging ridges indicate rafter or foundation problems. Any evidence of sagging or leaking will require an attic investigation. If a problem is discovered, take steps at once to effect repairs. Few maintenance problems can grow so swiftly to become major repairs.

- 2. <u>Gutters and Rainwater Leaders</u> -- inspect semi-annually and after heavy storms, along with the roof. If there is adequate warning, check also before heavy storms.
 - a. Check the gutters, leaders, and any leaf strainers for leaves, seeds, twigs, and other debris.
 - b. Insure the pitch of the gutters allows water to flow quickly into the leaders.
 - c. Investigate the leaders for any clogging.
 - d. Look for loose joints between the various parts of the gutters and leaders.
 - e. Notice whether the gutter supports and leader straps are detached or broken.
 - f. Examine the gutters and leaders for cracks, holes, corrosion, and missing pieces. Check any existing patches for cracks or gaps between the patch and the gutter.
 - g. Determine whether the paint is in good condition.
 - h. Observe the walls for evidence of stains from clogged or leaking gutters on rain water leaders.
 - i. Insure that the gutters, leaders, and other provisions for drainage successfully divert water away from the building.
 - j. Verify that all roof scuppers are clear. (Scuppers are the emergency overflow ports that prevent rainwater buildup because of plugged rainwater leaders.)

The rapid and complete removal of rainwater from the roof and away from the building is one of the best forms of insurance a structure can have. Regular inspection and maintenance are the premiums that keep the insurance in effect.

- 3. <u>Exterior at Grade</u> -- semi-annually (along with roofs, gutters, downspouts, and rainwater leaders).
 - a. Find out if the gutters, downspouts, and water drainage systems are working properly and directing water away from the foundation.
 - b. Insure that the soil and any walks and patios near the foundation always slope away from the building.
 - c. Check outside faucets for leaking.
 - d. Be on the lookout for the stains or other evidence of "splashback" caused by rain running off the roof instead of being carried away by gutters and rainwater leaders.
 - e. Inspect for "rising damp". This condition shows itself by means of dampness on the lower walls and foundations, near the grade level, and by accretions of mold and/or efflorescence.

4. <u>Concrete Balconies and Porches</u> -- annually

- a. Examine the connection between railings and floors or walls for evidence of rusting, cracking or spalling.
- b. Check the porch or balcony slab for deterioration and to insure that it slopes to the outside.
- c. Investigate the condition of the railings and insure that they remain well-secured to the walls and floor.
- d. Determine that the porch or balcony floor and/or roof are not pulling away from the building.
- e. Insure that terra-cotta or cast-stone ornamentation is undamaged and is firmly attached to the structure.

5. <u>Wooden Porches</u> (Red Cross Building, Historic Bakery) -- semi-annually

- a. Examine all wood components located near the ground for evidence of dry rot and insect damage.
- b. Scrutinize the columns and posts, especially at the bases, for decay.
- c. Look at the porch floor for cracks and deterioration and for the proper slope away from the building.
- d. Search the joints for any gaps, particularly where the porch joins the wall, roof or another material.
- e. Be certain the roofing material and the flashing are in sound condition. Check under the roof for dampness or moisture stains.
- f. Check the paint for peeling, blistering, or cracking.
- g. Be alert for rust spots around the nails, pointing to a possible moisture problem.

Porches and balconies are designed to shelter a building's openings. They themselves are unsheltered, open to the elements and frequently close to the ground. This makes them vulnerable targets for both moisture and insect infiltration. If a problem is discovered, remedy it immediately. Like roofs, porches under attack deteriorate rapidly.

6. Wood Doors -- annually

- a. Check the wood for deterioration, especially at the bottom.
- b. Look around the door and doorway for gaps where air and water might enter, and examine panels for cracks.
- c. Insure that the threshold is in good condition.
- d. Be alert for paint that is blistering or peeling.
- e. Observe whether the hinge and other hardware screws are tight.
- f. Notice whether the door sticks.
- g. Inspect the glass for cracks and the stops around the glass for looseness.

7. <u>Metal Doors, Vehicular and Hangar Doors</u> -- annually

- a. Check the structural condition of the door for evidence of rust or other deterioration.
- b. Observe the fit of the door, for freedom from warping or gaps.
- c. Inspect the condition of the painted finish.
- d. Insure the smooth operation of the door.
- e. Verify that hinges, tracks and hardware are all in functioning condition.
- f. Note the condition of glass, louvers, etc which are installed in the door.

Exterior doors should be weatherstripped. Because of the high level of use of doors, occupants should be enlisted to be alert for sagging, warping, or for hardware that begins loosening. With continued use, these problems can rapidly escalate into major repairs or replacement.

8. Windows and Frames, Wood -- annually

- Examine the glass for pitting, cracks and holes.
- b. Inspect the putty and/or the stops around the glass for cracking and looseness.
- c. Determine whether sash cords, hinges, tracks or hardware are either worn or broken
- d. Investigate the condition of insect screening and hardware.
- e. Inspect for gaps between the window and the wall and for loose joints in the sash or frame.
- f. Look for cracks, deterioration or decay in the wood.
- g. Check the condition of the paint.
- h. Be certain the outside sill slopes away from the window.

9. Windows and Frames, Metal -- annually

- a. Examine the glass for pitting, cracks and holes.
- b. Inspect the putty and/or the stops around the glass for cracking and looseness.
- c. Determine whether hinges, tracks or hardware are either worn or broken.
- d. Investigate the condition of insect screening and hardware.
- e. Inspect for gaps between the window and the wall and for loose joints in the sash or frame.
- f. Look for evidence of rusting or deterioration of the sash or frame.
- g. Check the condition of the paint.
- h. Be certain the outside sill slopes away from the window.

At March Field, as with nearly all historic districts, windows represent the most easily defined issue for balancing historic preservation concerns against maintenance concerns. Windows



are the least durable of the major architectural elements and one of the most visible elements. Whether original or replacement, windows will always represent an important character-defining element of the historic building.

Windows require vigilant inspection by maintenance staff. Windows too, should receive the attention of their users as they also are a moveable part of the building and subject to hard use. It is almost always easier and more economical to repair the one or two deficiencies in an older window than to find and install an appropriate replacement. Note also that the old "wavy" glass has become an irreplaceable artifact and example of the era of "drawn" glass. So too, many types of obscure and wire-reinforced glass, which give distinctive character to many of the District's windows, are now irreplaceable, and therefore worthy of extra protection.

10. Exterior Concrete Walls and Foundations -- annually

- a. Hairline cracks. These are inevitable in concrete and are no cause for concern unless accompanied by rust stains from within. Ordinarily, no action is required, unless in an area subject to high moisture levels.
- b. Rust. If the cause is not clearly external (e.g., a pipe railing attachment), this indicates degradation of the reinforcement and loss of a degree of structural strength. On grade, this may not necessarily be a hazard. In any structural situation calling for tensile strength however, a potential hazard exists or is developing and a structural engineer should be consulted.
- c. Rust-free cracks. Patch and monitor for further movement. A cement-epoxy combination is the most common patching material; but care must be exercised to insure a color that matches the surrounding concrete when the patch is fully cured. Do a test color sample test patch first.
- d. Moving cracks. This indicates an unresolved stress, loading, or settlement problem which must be discovered and remedied. Consult a structural engineer. When movement is arrested, proceed as in "c" above.
- e. Check the mortar in cast stone walls for missing pieces.
- f. Inspect all caulking for looseness, cracks and missing pieces.
- g. Determine whether any walls have moved out of alignment or bulged.
- h. Inspect the painted finish for cracking, peeling or blistering which could be the result of moisture in the wall.
- I. Examine the condition of the paint for chalking and for wear.
- j. Note where dense vegetation and sprinklers are close to exterior walls, and check for damage.
- k. Check for cracks, dents and moisture infiltration in terra cotta and artificial stone ornamentation applied to concrete walls. Seal the damaged area if bare terra cotta is exposed.

11. Exterior Wood Framed Walls

- a. Search for gaps in joints where moisture might enter between dissimilar materials, where the walls meet windows and doors, at the corners, around the juncture with the foundation, and between the various parts of the wall.
- b. Look at wood for cracks, warping, splitting, signs of decay, peeling or blistered paint.
- c. Notice whether stucco or plaster walls have holes, significant cracks (more than "hairline"), or water stains.
- e. Inspect all caulking for looseness, cracks and missing pieces.

- f. Determine whether any walls have moved out of alignment or bulged.
- g. Examine the condition of the paint for chalking, cracking, blistering, peeling.
- h. Note where dense vegetation and sprinklers are close to exterior walls, and check for damage.



There also exist limited underfloor areas evidenced by vents and gratings. These should be concurrently inspected for evidence of excessive moisture or deterioration.

12.3. Conclusions

In maintaining historic buildings at March Air Force Base, it is important to understand why the buildings are important and plan to preserve their most important elements. Sections 3 through 11 of this Maintenance Manual provide a detailed inventory of the contributing elements of each historic building. The same sections address the kinds of maintenance problems and restoration issues that commonly arise in historic buildings and are known to occur at March Air Force Base. It is important that key personnel involved in inspection and maintenance of the historic buildings understand the historic significance of the buildings and appreciate for themselves the interesting and irreplaceable qualities of these properties and the historic district in general.

Maintenance and base civil engineering staff should keep in mind that a substantial body of literature exists that addresses the practical problems of maintaining historic buildings. Some of the more useful reference books and pamphlets are included in Section 13, "Suggested Reading and Selected Bibliography." In addition in Appendix II a few of the key "Preservation Briefs" published by the National Park Service that deal with maintenance and treatment of building materials commonly found on historic buildings at March Air Force Base are reproduced.



13. Suggested Reading and Selected Bibliography

References for Maintenance of Historic Buildings and Structures

- Hanson, Shirley and Nancy Hubby. *Preserving and Maintaining the Older Home*. New York: McGraw Hill Book Company, 1983.
- Mills, Edward D., Ed. *Building Maintenance and Preservation*. London: Butterworth & Co., Ltd., 1980.
- Poore, Patricia, ed. The Old-House Journal Guide to Restoration. New York: Dutton, 1992.
- Shopsin, William C., AIA. *Restoring Old Buildings for Contemporary Uses.* New York: Whitney Library of Design, Billboard Publications, 1986.
- U.S. Department of the Interior. National Park Service. Preservation Assistance Division. Moisture Problems in Historic Masonry Walls-- Diagnosis and Treatment. By Baird M. Smith. Washington D.C.: 1984.
- _____. Respectful Rehabilitation: Answers to Your Questions About Old Buildings. Washington, D.C.: Preseration Press, 1982.
- . The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Revised. Washington D.C.: NPS, 1983.
- Weaver, Martin E. Conserving Buildings: A Guide to Techniques and Materials. New York: John Wiley & Sons, 1993.
- Weeks, Kay D. and Diane Maddey, Eds. *Building Maintenance and Preservation*. London: Butterworth & Co. Ltd., 1980.

National Park Service Technical Briefs (Copies may be requested from California SHPO)

- 1. The Cleaning and Waterproofing Coating of Masonry Buildings.
- 2. Repointing Mortar Joints in Historic Brick Buildings.
- 3. Conserving Energy in Historic Buildings.
- 4. Roofing for Historic Buildings.
- Preservation of Historic Adobe Buildings.
- 6. Dangers of Abrasive Cleaning in Historic Buildings.
- 7. The Preservation of Historic Glazed Architectural Terra-Cotta.
- 8. Aluminum and Vinyl Siding on Historic Buildings.
- 9. The Repair of Historic Wooden Windows.

- 10. Exterior Paint Problems on Historic Woodwork.
- 11. Rehabilitation of Historic Storefronts.
- 12. The Preservation of Historic Pigmented Structural Glass.
- 13. The Repair and Thermal Upgrading of Historic Steel Windows.
- 14. New Exterior Additions To Historic Building: Preservation Concerns.
- 15. Preservation of Historic Concrete: Problems and General Approaches.
- 16. The Use of Substitute Materials on Historic Building Exteriors.
- 17. Architectural Character: Identifying The Visual Aspects of Historic Buildings as an Aid to Preserving Their Character.
- 18. Rehabilitating Interiors in Historic Buildings: Identifying and Preserving Character-Defining Elements.
- 19. The Repair and Replacement of Historic Wooden Shingle Roofs.
- 20. The Preservation of Historic Barns.
- 21. Repairing Historic Flat Plaster Walls and Ceilings.
- 22. The Preservation and Repair of Historic Stucco.
- 23. Preserving Historic Ornamental Plaster.
- 24. Heating, Ventilating, and Cooling Historic Buildings: Problems and Recommended Approaches.
- 25. The Preservation of Historic Signs.
- 26. The Preservation and Repair of Historic Log Buildings.
- 27. The Maintenance and Repair of Architectural Cast Iron.
- 28. Painting Historic Interiors.
- 29. The Repair, Replacement, and Maintenance of Historic Slate Roofs.
- 30. The Preservation and Repair of Historic Clay Tile Roofs.
- 31. Mothballing Historic Buildings.
- 32. Making Historic Properties Accessible.
- 33. The Preservation and Repair of Historic Stained and Leaded Glass.

Selected Bibliography

- Advisory Council on Historic Preservation. Section 106, Step by Step. Washington D.C.: Advisory Council on Historic Preservation, 1986.
- _____. Protection of Historic Properties Under 36 CFR Part 800. Washington D.C.: Advisory Council on Historic Preservation, 1986.
- _____. Public Participation in Section 106 Review: A Guide for Agency Officials. Washington D.C.: Advisory Council on Historic Preservation, 1989.
- Advisory Council on Historic Preservation and Department of the Interior, National Park Service. *Identification of Historic Properties: A Decisionmaking Guide for Managers.*Washington D.C.: Advisory Council on Historic Preservation, 1988.
- State of California, Department of Parks and Recreation. California Archaeological Inventory Handbook for Completing An Archaeological Site Record. Sacramento: Department of Parks and Recreation, 1986.
- U.S. Department of the Interior, National Park Service. Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. Revised. Washington, D.C: U.S. Department of the Interior, 1983.
- . Guidelines for Federal Agency Responsibilities Under Section 110 of the National Historic Preservation Act. Washington, D.C.: U.S. Department of the Interior, 1988.

Related Authorities

- 1978 American Indian Religious Freedom Act of 1978 (Public Law 95-341; 42 U.S.C. 1996).
- 1906 Antiquities Act of 1906 (Public Law 59-209; 16 U.S.C. 431-433).
- 1974 Archeological and Historic Preservation Act of 1974 (Public Law 93-291; 16 U.S. C. 469-469c).
- 1979 Archeological Resources Protection Act of 1979 (Public Law 96-95; 16 U.S.C. 470aa-11).
- 1979 Curation of Federally Owned and Administered Archeological Collection (36 CFR 79).
- 1979 Defense Appropriations Act.
- 1971 Executive Order 11593, *Protection and Enhancement of the Cultural Environment,* May 13, 1971. (Reprinted as a mote at 16 U.S.C. 470).
- 1950 Federal Records Act of 1950. (64 STAT. 583; 44 USC 21).
- 1935 Historic Sites Act of 1935 (Public Law 72-292; 16 U.S.C. 461-467).
- 1966 National Historic Preservation Act of 1966, as amended (Public Law 89-665; 16 U.S.C. 470-470w-6).

- 1969 National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190; 42 U.S.C. 4321-4347).
- 1990 Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601;25 USC 3001-3013).
- 1976 Public Buildings Cooperative Use Act of 1976 (Public Law 94-541; 40 U.S.C. 490 601a, 606, 611, and 612a).

Additional Related Authorities

- 1983 Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines, Federal Register, Vol. 48, No. 190, 29 September 1983, pp. 44716-44740.
- 1979 Archeological Resources Protection Act of 1979; Uniform Regulations, 32 CFR Part 229.
- 1984 Department of Defense Directive 4710.1, Archeological and Historic Resource Management, 21 June 1984.
- 1984 Determinations of Eligibility for Inclusion in the National Register of Historic Places, 36 CFR 63.
- 1982 Guidelines for Exemptions Under Section 214 of the National Historic Preservation Act, Federal Register, Vol. 47, No. 201, 18 October 1982.
- 1982 Historic Preservation Certifications Pursuant to the Tax Reform act of 1976, the Revenue Act of 1978, the Tax Treatment Extension Act of 1980, and the Economic Recovery Tax Act of 1981, 36 CFR 67.
- 1982 National Historic Landmarks Program, 36 CFR 65.
- 1982 National Register of Historic Places, 36 CFR 60.
- 1982 Protection of Historic and Cultural Properties, 36 CFR 800.
- 1982 The Secretary of the Interior's Standards for Historic Preservation Projects, 36 CFR 68.
- 1983 The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, Revised 1983.
- 1980 Treatment of Archeological Properties, Advisory Council on Historic Preservation, November 1980.
- 1980 Waiver of Federal Agency Responsibilities Under Section 110 of the National Historic Preservation Act, 36 CFR 78.
- 1993 US. Air Force Cultural Resources Management: A Manager's Primer, February 1993.

APPENDICES

Appendix I

Index To Buildings

Building Number	Page Number
100 102 108 112 113 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151	9-3 9-11 9-14 5-5 5-6 3-17 5-8 3-93 3-94 3-96 3-97 3-41 3-98 3-17 3-18 3-99 3-42 3-19 3-20 3-44 3-60 3-21 3-22 3-61 3-23 3-45 3-45 3-24 3-46 3-24 3-99 3-100 3-101 3-27 3-102 3-49 9-17 3-28 3-103 3-63
152 153	3-105 3-29

Building Number	Page Number
154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219	9-21 3-50 3-106 3-30 3-107 3-64 3-108 3-31 3-81 3-33 3-73 5-9 3-34 3-74 3-120 3-121 3-122 5-11 3-122 5-14 5-16 5-17 5-18 4-65 4-65 4-65 4-65 4-65 4-69 4-70 4-15 4-71 4-72 4-43 4-74 4-73 4-74 4-73 4-74 4-73 4-74 4-18
220	4-75

B 22 2	D. M. I
Building Number	Page Number
221	4-76
222	4-77
223	4-78
224	4-19
225	4-20
226	4-79
227	4-80
228	4-45
229	4-46
230	4-81
231	4-82
232	4-21
233	4-23
234	4-83
235	4-84
236	4-47
237	4-48
238	4-85
239	4-86
240	4-24
241	4-25
242	4-87
243	4-88
244	4-50
245	4-51
246	4-89
247	4-90
248	4-26
249	4-27 4-91
250 251	4-92
252	5-19
253	5-20
254	5-21
255	5-22
256	5-24
257	5-25
300	6-9
301	9-25
311	7-5
315	9-31
317	9-34
323	9-40
328	4-93
329	4-52
330	4-94
331	5-26
332	4-28
· —	- -

Building Number	Page Number
333 334	4-95 4-53
335	4-54
336	4-96
337	4-29
338	4-97
339	4-55
340	4-98
341	4-30
342	4-99
343 344	4-56 4-100
345	4-31
346	4-101
355	6-11
362	5-27
364	5-28
373	6-13
381	4-102
382	4-32
383 385	4-103 6-16
386	9-49
400	7-9
405	9-52
406	9-55
407	9-56
408	9-58
409	9-59
411	9-63
412	9-66
413 417	9-69 9-73
418	9-73 9-77
420	8-5
429	6-20
430	8-9
431	9-80
432	9-82
433	9-85
435	8-11
439 440	9-88 6-23
441	8-14
452	6-27
453	6-29
456	7-14
457	6-31

And the second	Building Number	Page Number
	458 463 465 466 467 470 472 479 488 497 641 641A	6-34 9-90 9-93 9-98 9-104 9-108 9-114 9-117 9-120 9-121 10-3 10-7

Appendix II: A National Park Service, Preservation Brief No. 1

"The Cleaning and Waterproof Coating of Masonry Buildings."

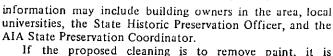
PRESERVATION BRIEFS

The Cleaning and Waterproof Coating of Masonry Buildings

Robert C. Mack, A.I.A.

consequences of their inappropriate use.

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



If the proposed cleaning is to remove paint, it is important in each case to learn whether or not exposed brick is historically appropriate. Many buildings were painted at the time of construction or shortly thereafter; retention of the paint, therefore, may be more appropriate historically than exposing the brick, in spite of current attitudes about "natural" brick. Even in cases where unpainted masonry is appropriate, the retention of the paint may be more practical than removal in terms of long range preservation of the masonry. In some cases, however, removal of the paint may be desirable. For example, the old paint layers may have built up to such an extent that removal is necessary prior to repainting. It is essential, however, that research on the paint type, color, and layering be completed on the entire building before removal.

Why Clean?

The inappropriate cleaning and waterproofing of masonry

buildings is a major cause of deterioration of the Nation's

historic resources. While both treatments may be appropriate

in some cases, they may cause serious deterioration in others.

The purpose of this leaflet is to provide guidance on the techniques of cleaning and waterproofing, and to explain the

The reasons for cleaning any building must be considered carefully before arriving at a decision to clean.

- -Is the cleaning being done to improve the appearance of the building or to make it look new? The so-called "dirt" actually may be weathered masonry, not accumulated deposits; a portion of the masonry itself thus will be removed if a "clean" appearance is desired.
- -Is there any evidence that dirt and pollutants are having a harmful effect on the masonry? Improper cleaning can accelerate the deteriorating effect of pollutants.
- -Is the cleaning an effort to "get your project started" and improve public relations? Cleaning may help local groups with short term fund raising, yet cause long term damage to the building.

These concerns may lead to the conclusion that cleaning is not desirable-at least not until further study is made of the building, its environment and possible cleaning methods.

What Is The Dirt?

The general nature and source of dirt on a building must be determined in order to remove it in the most effective, yet least harmful, manner. Soot and smoke, for example, may require a different method of cleaning than oil stains or bird droppings. The "dirt" also may be a weathered or discolored portion of the masonry itself rather than extraneous materials. Removal of part of the masonry thus would be required to obtain a "clean" appearance, leading to loss of detail and gradual erosion of the masonry. Other common cleaning problems include metal stains such as rust or copper stains, and organic matter such as the tendrils left on the masonry after removal of ivy. The source of dirt, such as coal soot, may no longer be a factor in planning for longer term maintenance, or it may be a continuing source of problems. Full evaluation of dirt and its effect on the building may require one or several kinds of expertise: consultants may include building conservators, geologists, chemists, and preservation architects. Other sources of local experience or

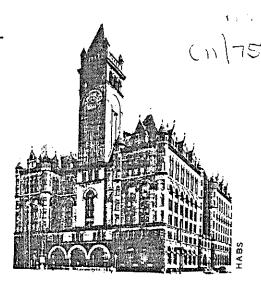
What Is The Construction Of The Building?

The construction of the building must be considered in developing a cleaning program because inappropriate cleaning can have a corrosive effect on both the masonry and the other building materials.

Incorrectly chosen cleaning products can cause damaging chemical reactions with the masonry itself. For example, the effect of acidic cleaners on marble and limestone generally is recognized. Other masonry products also are subject to adverse chemical reactions with incompatible cleaning products. Thorough understanding of the physical and chemical properties of the masonry can help you avoid the inadvertent selection of damaging cleaning materials.

Other building materials also may be affected by the cleaning process; some chemicals, for example, may have a corrosive effect on paint or glass. The portions of building elements most vulnerable to deterioration may not be visible, such as embedded ends of iron window bars. Other totally unseen items, such as iron cramps or ties which hold the masonry to the structural frame, also may be subject to corrosion from the use of chemicals or even from plain water (Fig. 1). The only way to prevent problems in these cases is to study the building construction in detail and evaluate proposed cleaning methods with this information in mind.

Previous treatments of the building and its surroundings also should be evaluated, if known. Earlier waterproofing applications may make cleaning difficult. Repairs may have been stained to match the building, and cleaning may make



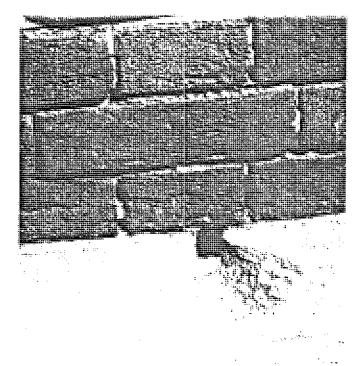


Figure 1. The iron anchor shown here originally was hidden from view. An increase in volume due to rusting created internal pressures on the stone and brick, causing spalling. Careful study of the building construction can result in the identification of these potential problem areas and they can be taken into consideration while planning a cleaning project.

these differences apparent. Salts or other snow removal chemicals used near the building may have dissolved and been absorbed into the masonry, causing potentially serious problems of spalling or efflorescence. Techniques for overcoming each of these problems should be considered prior to the selection of a cleaning method.

Types Of Cleaning

Cleaning methods generally are divided into three major groups: water, chemical, and mechanical (abrasive). Water methods soften the dirt and rinse the deposits from the surface. Chemical cleaners react with the dirt and/or masonry to hasten the removal process; the deposits, reaction products and excess chemicals then are rinsed away with water. Mechanical methods include grit blasting (usually sand blasting), grinders, and sanding discs, which remove the dirt by abrasion and usually are followed by a water rinse. Problems related to each of these cleaning methods will be discussed later in this leaflet.

Planning A Cleaning Project

Once the existing conditions have been evaluated, including the type of dirt and the building materials, planning for the cleaning project can begin.

Environmental concerns: The potential effect of each proposed method of cleaning should be evaluated carefully. Chemical cleaners, even though dilute, may damage trees, shrubs, grass, and plants. Animal life, ranging from domestic pets to song birds to earth worms, also may be affected by the run-off. In addition, mechanical methods can produce hazards through the creation of airborne dust.

The proposed cleaning project also may cause property damage. Wind drift, for example, may carry cleaning

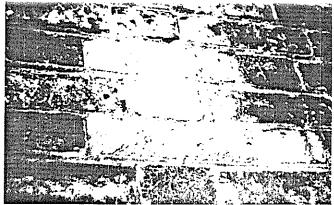


Figure 2. The white deposits are efflorescence, soluble salts deposited on the surface of the masonry. These salts usually originate in the masonry or mortar, migrate from the ground below through capillary action, or are brought in by air pollution. The salts also may be the result of chemical reactions resulting from selection of an improper cleaner.

chemicals onto nearby automobiles, causing etching of the glass or spotting of the paint finish. Similarly, airborne dust can enter surrounding buildings, and excess water can collect in nearby yards and basements.

Personal safety: The potential health dangers of each method proposed for the cleaning project must be considered, and the dangers must be avoided. Both acidic and alkaline chemical cleaners can cause serious injury to cleaning operators and passers-by; injuries can be caused by chemicals in both liquid and vapor forms. Mechanical methods cause dust which can pose a serious health hazard, particularly if the abrasive or the masonry contain silica. Steam cleaning has serious hazards because of high temperatures.

Testing cleaning methods: Several potentially useful cleaning methods should be tested prior to selecting the one for use on the building. The simplest and least dangerous methods should be included—as well as those more complicated. All too often simple methods, such as a low pressure water wash, are not even considered, yet they frequently are effective, safe, and least expensive. Water of slightly higher pressure or with a mild non-ionic detergent additive also may be effective. It is worth repeating that these methods should be tested prior to considering harsher methods; they are safer for the building, safer for the environment, and less expensive.

The level of cleanliness desired also should be determined prior to selection of a cleaning method. Obviously, the intent of cleaning is to remove most of the dirt. A "brand new" appearance, however, may be inappropriate for an older building, and may require an overly harsh cleaning method. It may be wise, therefore, to determine a lower level of acceptable cleaning. The precise amount of residual dirt considered acceptable would depend upon the type of masonry and local conditions.

Cleaning tests, whether using simple or complex methods, should be applied to an area of sufficient size to give a true indication of effectiveness. The test patch should include at least a square yard, and, with large stones, should include several stones and mortar joints. It should be remembered that a single building may have several types of masonry materials and similar materials may have different surface finishes; each of these differing areas should be tested separately. The results of the tests may well indicate that several methods of cleaning should be used on a single building.

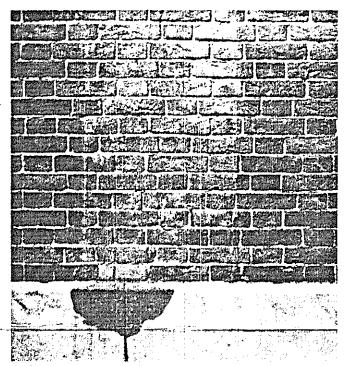


Figure 3. The hazy appearance of a portion of the brick is caused by a residue resulting from cleaning. This film occurred in spite of thorough rinsing. Test patches such as this should always be allowed to weather prior to continuing with the cleaning.

The cleaning budget should include money to pay for these tests. Usually contractors are more willing to conduct a variety of tests if they are reimbursed for their time and materials, particularly if the tests include methods with which the contractor is not familiar.

When feasible, test areas should be allowed to weather for an extended period prior to evaluation. A waiting period of a full year is not unreasonable in order to expose the masonry to a full range of seasons. For any building which is considered historically important, the delay is insignificant compared to the potential damage and disfigurement which may arise from use of an incompletely tested method (Figs. 2-5).

Potential Problems Of Cleaning

Water Cleaning: Water cleaning methods include: (1) low pressure wash over an extended period, (2) moderate to high pressure wash, and (3) steam. Bristle brushes frequently are used to supplement the water wash. All joints, including mortar and sealants, must be sound in order to minimize water penetration to the interior.

Porous masonry may absorb excess amounts of water during the cleaning process and cause damage within the wall or on interior surfaces. Normally, however, water penetrates only part way through even moderately absorbant masonry materials.

Excess water also can bring soluble salts from within the masonry to the surface, forming efflorescences (Fig. 2); in dry climates, the water may evaporate inside the masonry, leaving the salts slightly in back of the surface. The damage which can be caused by soluble salts is explained in more detail later in this leaflet. Efflorescence usually can be traced to a source other than a single water wash.

Another source of surface disfigurement is chemicals such as iron and copper in the water supply; even "soft" water may contain deleterious amounts of these chemicals. Water methods cannot be used during periods of cold

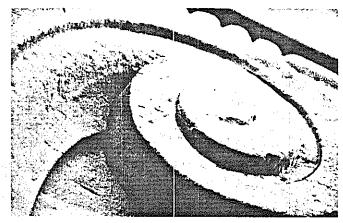


Figure 4. Sandblasting has rounded the corners of this marble capital and pitted the formerly smooth surface. Not only is the stone harmed visually, the increased roughness of the surface also will collect new dirt more quickly than smooth stone.

weather because water within the masonry can freeze, causing spalling and cracking. Since a wall may take over a week to dry after cleaning, no water cleaning should be permitted for several days prior to the first average frost date, or even earlier if local forecasts predict cold weather.

In spite of these potential problems, water methods generally are the simplest to carry out, the safest for the building and the environment, and the least expensive.

Chemical cleaning: Since most chemical cleaners are water based, they have many of the potential problems of plain water. Additional problems of chemical cleaning agents have been mentioned in the discussion of environmental concerns.

Chemical cleaners have other problems as well. Some types of masonry are subject to direct attack by cleaning chemicals. Marble and limestone, for example, are dissolved easily by acidic cleaners, even in dilute forms. Another problem may be a change in the color of the masonry caused by the chemicals, not by removal of dirt; the cleaner also may leave a hazy residue in spite of heavy rinsing (Fig. 3). In addition, chemicals can react with components of mortar, stone, or brick to create soluble salts which can form efflorescences, as mentioned earlier. Historic brick buildings are particularly susceptible to damage from hydrochloric (muriatic) acid, although it is, unfortunately, widely used on these structures.

Mechanical cleaning: Grit blasters, grinders, and sanding discs all operate by abrading the dirt off the surface of the masonry, rather than reacting with the dirt and masonry as in water and chemical methods. Since the abrasives do not differentiate between the dirt and the masonry, some erosion of the masonry surface is inevitable with mechanical methods, especially blasting. Although a skilled operator can minimize this erosion, some erosion will still take place. In the case of brick, soft stone, detailed carvings, or polished surfaces, even minimal erosion is unacceptable (Figs. 4 and 5). Brick, a fired product, is hardest on the outside where the temperatures were highest; the loss of this "skin" of the brick exposes the softer inner portion to more rapid deterioration. Abrasion of intricate details causes a rounding of sharp corners and other loss of delicate features, while abrasion of polished surfaces removes the polished quality of stone. Mechanical methods, therefore, should never be used on these surfaces and should be used with extreme caution on others.

Grit blasting, unfortunately, still is widely used in spite of these serious effects. In most cases, blasting will leave

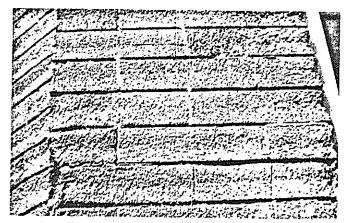


Figure 5. This brickwork was sandblasted to remove paint. Note the severe erosion which has occurred, especially in the softer center sections of this "hard burned" late 19th-century brick. Although this is a severe example, the same problem of increased roughness and porosi'y will occur even on more skillfully performed jobs where the effect is less evident visually.

minute pits on the surface of the masonry. This additional roughness actually increases the surface area on which new dirt can settle and on which pollutants can react.

Mortar joints, especially those with lime mortar, also can be eroded by mechanical cleaning. In some cases, the damage may be visual, such as loss of joint detail or increased joint shadows. Joints constitute a significant portion of the masonry surface (up to 20% in a brick wall) so this change should not be considered insignificant. In other cases, however, the erosion of the mortar joint may permit increased water penetration, leading to the necessity for complete repointing.

Other problems of mechanical methods have been mentioned in the discussion of project planning. In addition, wet blasting or water rinses can create the potential hazards of water methods.

Problems Of Water Repellent And Waterproof Coatings Is waterproofing necessary? Coatings frequently are applied to historic buildings without concern for the requirement or the consequences of the coating. Most historic buildings have survived for years without coatings, so why are they needed now? Water penetration to the interior usually is not caused by porous masonry but by deteriorated gutters and downspouts, deteriorated mortar, capillary moisture from the ground (rising damp), or condensation. Coatings will not solve these problems. In the case of rising damp, in fact, the coatings will allow the water to go even higher because of the retarded rate of evaporation. The claim also is made that coatings keep dirt and pollutants from collecting on the surface of the building thus reducing the requirement for future cleaning. While this at times may be true, at other times the coatings actually retain the dirt more than uncoated masonry. More important, however, is the fact that these coatings can cause greater deterioration of the masonry than that caused by pollution, so the treatment may be worse than the problem one is attempting to solve.

Types of eoatings: Masonry coatings are of two types: waterproof coatings and water repellent coatings. Waterproof coatings seal the surface from liquid water and from water vapor; they usually are opaque, such as bituminous coatings and some paints. Water repellents keep liquid water from penetrating the surface but allow water vapor to enter and leave through the "pores" of the masonry. They usually are transparent, such as the silicone coatings, although they may

change the reflective property of the masonry, thus changing the appearance.

Waterproof coatings: These coatings usually do not cause problems as long as they exclude all water from the masonry. If water does enter the wall, however, the coating can intensify the damage because the water will not be able to escape. During cold weather this water in the wall can freeze, causing serious mechanical disruption, such as spalling. In addition, the water eventually will get out by the path of least resistence. If this path is toward the interior, damage to interior finishes can result; if it is toward exterior cracks in the coating, it can lead to damage from the build-up of salts as described below.

Water repellent coatings: These coatings also can cause serious damage, but by a somewhat different mechanism. As water repellent coatings do not seal the surface to water vapor, it can enter the wall as well as leave the wall. Once inside the wall, the vapor can condense at cold spots, producing liquid water. Water within the wall, whether from condensation, leaking gutters, or other sources, can do damage, as explained earlier.

Further damage can be done by soluble salts. Salts frequently are present in the masonry, either from the mortar or from the masonry units themselves. Liquid water can dissolve these salts and carry them toward the surface. If the water is permitted to come to the surface, efflorescences appear upon evaporation. These are unsightly but usually are easily removed; they often are washed away by the simple action of the rain.

The presence of a water repellent coating, however, prevents the water and dissolved salts from coming completely to the surface. The salts then are deposited slightly behind the surface of the masonry as the water evaporates through the pores. Over time, the salt crystals will grow and will develop substantial pressures which will spall the masonry, detaching it at the depth of crystal growth. This build-up may take several years to cause problems.

Test patches for coatings generally do not allow an adequate evaluation of the treatment, because water may enter and leave through the surrounding untreated areas, thus flushing away the salt build-up. In addition, salt deposits may not cause visible damage for several years, well after the patch has been evaluated.

This is not to suggest that there is never a use for water repellents or waterproofings. Sandblasted brick, for example, may have become so porous that paint or some type of coating is essential. In other cases, the damage being caused by local pollution may be greater than the potential damage from the coatings. Generally, coatings are not necessary, however, unless there is a specific problem which they will help to solve. If the problem occurs on only a portion of the masonry, it probably is best to treat only the problem area rather than the entire building. Extreme exposures such as parapets, for example, or portions of the building subject to driving rains can be treated more effectively and less expensively than the entire building.

This publication was prepared pursuant to Executive Order 11593, "Protection and Enhancement of the Cultural Environment," which directs the Secretary of the Interior to "develop and make available to Federal agencies and State and local governments information concerning professional methods and techniques for preserving, improving, restoring and maintaining historic properties." The Brief has been developed under the technical editorship of Lee H. Nelson, AIA, Chief, Preservation Assistance Division, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240. Comments on the usefulness of this information are welcome and can be sent to Mr. Nelson at the above address. This publication is not copyrighted and can be reproduced without popularly. Normal procedures for credit to the author and the National Park Service are appreciated. November 1975.

Appendix II: B

National Park Service, Preservation Brief No. 15

"Preservation of Historic Concrete: Problems and General Approaches."

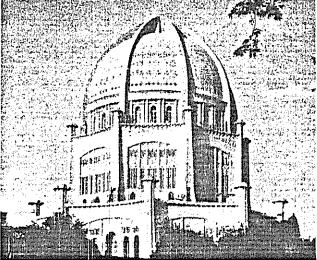
مان يني∧

1 PRESERVATION PRIFES

Preservation of Historic Concrete: Problems and General Approaches

William B. Coney, A.I.A. Wiss, Janney, Elstner Associates, Inc.

U.S. Department of the Interior, National Park Service/ Rocky Mountain Regional Office, Division of Cultural Resources



The Secretary of the Interior's "Standards for Rehabilitation" require that deteriorated architectural features shall be repaired rather than replaced. When the severity of deterioration requires removal of historic material, its replacement should match the material being replaced in composition, design, color, texture, and other visual qualities.

"Concrete" is a name applied to any of a number of compositions consisting of sand, gravel, crushed stone, or other coarse material, bound together with various kinds of cementitious materials, such as lime or cements. When water is added, the mix undergoes a chemical reaction and hardens. An extraordinarily versatile building material, concrete is used for the utilitarian, the ornamental, and the monumental. While early proponents of modern concrete considered it to be permanent, it is, like all materials, subject to deterioration. This Brief surveys the principal problems posed by concrete deterioration, their likely causes, and approaches to their remedies. In almost every instance, remedial work should only be undertaken by qualified professionals. Faulty concrete repair can worsen structural problems and lead to further damage or safety hazards. Concrete repairs are not the province of doit-yourselfers. Consequently, the corrective measures discussed here are included for general information purposes only; they do not provide "how to" advice.

HISTORICAL OVERVIEW

The Romans found that the mixture of lime putty with pozzolana, a fine volcanic ash, would harden under water. The result was possibly the first hydraulic cement. It became a major feature of Roman building practice, and was used in many buildings and engineering projects such as bridges and aqueducts. Concrete technology was kept alive during the Middle Ages in Spain and Africa, with the Spanish introducing a form of concrete to the New World in the first decades of the 16th century. It was used by both the Spanish and English in coastal areas stretching from

Florida to South Carolina. Called "tapia," or "tabby," the substance was a creamy white, monolithic masonry material composed of lime, sand, and an aggregate of shells, gravel, or stone mixed with water. This mass of material was placed between wooden forms, tamped, and allowed to dry, the building arising in layers, about one foot at a time.

Despite its early use, concrete was slow in achieving widespread acceptance as a building material in the United States. In 1853, the second edition of Orson S. Fowler's A Home for All publicized the advantages of "gravel wall" construction to a wide audience, and poured gravel wall buildings appeared across the United States (see fig. 1). Seguin, Texas, 35 miles east

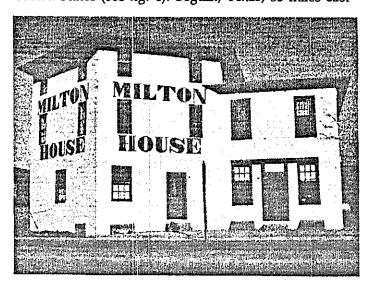


Fig. 1. Milion House, Milton, Wisconsin (1844). An early example of gravel wall construction with 12- to 15-inch thick monoliii.ic concrete walls coated on the exterior with stucco. Photo: William B. Coney.

of San Antonio, came to be called "The Mother of Concrete Cities" for some 90 concrete buildings made from local "lime water" and gravel (see fig. 2). Impressed by the economic advantages of poured gravel wall or "lime-grout" construction, the Quartermaster General's Office of the War Department embarked on a campaign to improve the quality of building for frontier military posts. As a result, lime-grout structures were built at several western posts, such as the buildings that were constructed with 12- or 18-inchthick walls at Fort Laramie, Wyoming between 1872 and 1885. By the 1880s sufficient experience had been gained with unreinforced concrete to permit construction of much larger buildings. The Ponce de Leon Hotel in St. Augustine, Florida, is a notable example from this period (see fig. 3).

Reinforced concrete in the United States dates from 1860, when S.T. Fowler obtained a patent for a reinforced concrete wall. In the early 1870s William E. Ward built his own house in Port Chester, New York, using concrete reinforced with iron rods for all structural elements. Despite these developments, such construction remained a novelty until after 1880, when in-



Fig. 2. Sebastopol House, Seguin, Texas (1856). This Greek Revival dwelling is one of the few remaining poured-in-place concrete structures in this Texas town noted for its construction of over 90 concrete buildings in the mid-nineteenth century. The high parapets surrounding the flat roof were lined and served as a water reservoir to cool the house. Photo: Texas Historical Commission.

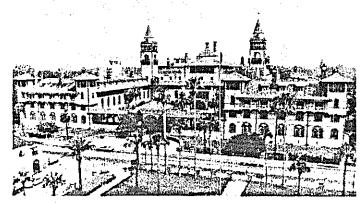


Fig. 3. Ponce de Leon Hotel, St. Augustine, Florida (1885-87). An example of unreinforced concrete used on a grand scale, this Spanish Colonial Revival hotel was designed by Carrere and Hastings and commissioned by railroad magnate Henry Flagler. The building now serves as the main campus hall for Flagler College. Photo: Flagler College.

novations introduced by Ernest L. Ransome made reinforced concrete more practicable. The invention of the horizontal rotary kiln allowed production of a cheaper, more uniform and reliable cement, and led to the greatly increased acceptance of concrete after 1900.

During the early 20th century Ransome in Beverly, Massachusetts, Albert Kahn in Detroit, and Richard E. Schmidt in Chicago promoted concrete for utilitarian buildings with their "factory style," featuring an exposed concrete skeleton filled with expanses of glass. Thomas Edison's cast-in-place reinforced concrete homes in Union Township, New Jersey, proclaimed a similarly functional emphasis in residential construction (see fig. 4). From the 1920s onward, concrete began to be used with spectacular design results: in James J. Earley and Louis Bourgeois' exuberant, graceful Baha'i Temple in Wilmette, Illinois (see cover); and in Frank Lloyd Wright's masterpiece "Fallingwater" near Mill Run, Pennsylvania (see fig. 5). Eero Saarinen's soaring Terminal Building at Dulles International Airport outside Washington, D.C., exemplifies the masterful use of concrete achieved in the Modern

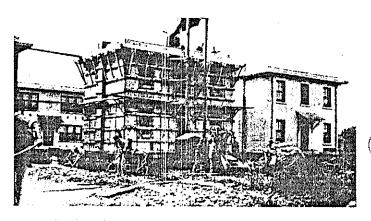


Fig. 4. Thomas A. Edison's Cast-in-Place Houses, Union Township, New Jersey (1909). This construction photo shows the formwork for the cast-in-place reinforced concrete houses built as low-cost housing using a standard 25- by 30-foot module. Photo: Edison National Historical Site.



Fig. 5. "Fallingwater," near Mill Run, Pennsylvania (1936-37). This dramatic reinforced concrete residence by Frank Lloyd Wright is anchored into bedrock on the hillside and cantilevered over the stream. The great tensile strength of reinforced concrete made this type of construction possible. Photo: Paul Mayen.

Types of Concrete

Unreinforced concrete is a composite material containing aggregates (sand, gravel, crushed shell, or rock) held together by a cement combined with water to form a paste, and gets its name from the fact that it does not have any iron or steel reinforcing bars. It was the earliest form of concrete. The ingredients become a plastic mass that hardens as the concrete hydrates, or "cures." Unreinforced concrete, however, is relatively weak, and since the turn of the century has largely been replaced by reinforced concrete. Reinforced concrete is conrete strengthened by the inclusion of metal bars, which increase the tensile strength of concrete. Both unreinforced and reinforced concrete can be either cast in place or precast. Cast-in-place concrete is poured on-site into a previously erected formwork that is removed after the concrete has set Precast concrete is molded off-site into building components. More recent developments in concrete technology include post-tensioned concrete and pre-stressed concrete, which feature greater strength and reduced cracking in reinforced structural elements.

CAUSES OF CONCRETE DETERIORATION

Deterioration in concrete can be caused by environmental factors, inferior materials, poor workmanship, inherent structural design defects, and inadequate maintenance (see figs. 6, 7, and 8).

Environmental factors are a principal source of concrete deterioration. Concrete absorbs moisture readily, and this is particularly troublesome in regions of recurrent freeze-thaw cycles. Freezing water produces expansive pressure in the cement paste or in nondurable aggregates. Carbon dioxide, another atmospheric component, can cause the concrete to deteriorate by reacting with the cement paste at the surface.

Materials and workmanship in the construction of early concrete buildings are potential sources of problems. For example, aggregates used in early concrete, such as cinders from burned coal and certain crushed brick, absorb water and produce a weak and porous concrete. Alkali-aggregate reactions within the concrete can result in cracking and white surface staining. Ag-

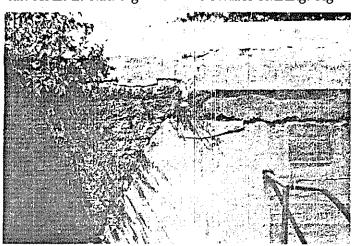


Fig. 6. Battery Fortifications, Ft. Washington, Maryland (1891-97). This unreinforced concrete fortification exhibits several kinds of deterioration: the diagonal structural crack due to uneven settlement, the long horizontal crack at the cold joint, the spalling of the concrete surface coating, and vegetative growth. Photo: Sharon C. Park, AIA.

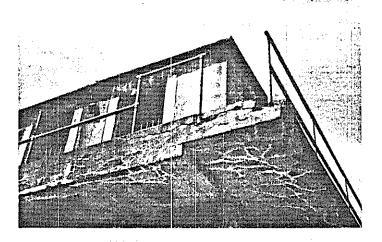


Fig. 7. Battery Commander's Station, Ft. Washington, Maryland (1904). This reinforced concrete tower with a cantilevered balcony is showing serious deterioration. Water has penetrated the slab, causing freeze-thaw spalling around the posts and corrosion of the reinforcing bars. This internal corrosion is causing expansion inside the slab and creating major horizontal cracks in the concrete. Under the balcony can be seen the network of hardened white calcified deposits, which have exuded through cracks in the concrete as a result of alkali-aggregate reaction. Photo: Lee H. Nelson, FAIA.

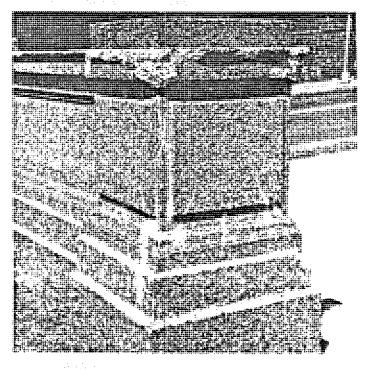


Fig. 8. Meridian Hill, Washington, D.C. (1934). This reinforced concrete pier has lost much of its projecting molding partly from accidental impact and partly from spalling induced by freeze-thaw action. Evidence of moisture leaching out from the interior through cracks is seen as white deposits on the surface of this exposed aggregate concrete. Photo: Lee H. Nelson, FAIA.

gregates were not always properly graded by size to ensure an even distribution of elements from small to large. The use of aggregates with similarly sized particles normally produced a poorly consolidated and therefore weaker concrete. Early builders sometimes inadvertently compromised concrete by using seawater or beach sand in the mix or by using calcium chloride or a similar salt as an additive to make the concrete more "fireproof." A common practice, until recently, was to add salt to strengthen concrete or to lower the freezing point during cold-weather construction. These practices cause problems over the long term.

In addition, early concrete was not vibrated when poured into forms as it is today. More often it was tamped or rodded to consolidate it, and on floor slabs it was often rolled with increasingly heavier rollers filled with water. These practices tended to leave voids (areas of no concrete) at congested areas, such as at reinforcing bars at column heads and other critical structural locations. Areas of connecting voids seen when concrete forms are removed are known as "honeycombs" and can reduce the protective cover over the reinforcing bars.

Other problems caused by poor workmanship are not unknown today. If the first layer of concrete is allowed to harden before the next one is poured next to or on top of it, joints can form at the interface of the layers. In some cases, these "cold joints" visibly detract from the architecture, but are otherwise harmless. In other cases, "cold joints" can permit water to infiltrate, and subsequent free-thaw action can cause the joints to move. Dirt packed in the joints allows weeds to grow, further opening paths for water to enter. Inadequate curing can also lead to problems. If moisture leaves newly poured concrete too rapidly because of low humidity, excessive exposure to sun or wind, or use of too porous a substrate, the concrete will develop shrinkage cracks and will not reach its full potential strength.

Structural Design Defects in historic concrete structures can be an important cause of deterioration. For example, the amount of protective concrete cover around reinforcing bars was often insufficient. Another design problem in early concrete buildings is related to the absence of standards for expansion-contraction joints to prevent stresses caused by thermal movements, which may result in cracking.

Improper Maintenance of historic buildings can cause long-term deterioration of concrete. Water is a principal source of damage to historic concrete (as to almost every other material) and prolonged exposure to it can cause serious problems. Unrepaired roof and plumbing leaks, leaks through exterior cladding, and unchecked absorption of water from damp earth are potential sources of building problems. Deferred repair of cracks allowing water penetration and freeze-thaw attacks can even cause a structure to collapse. In some cases the application of waterproof surface coatings can aggravate moisture-related problems by trapping water vapor within the underlying material.

MAJOR SIGNS OF CONCRETE DETERIORATION

Cracking occurs over time in virtually all concrete.

Cracks vary in depth, width, direction, pattern, location, and cause. Cracks can be either active or dormant (inactive). Active cracks widen, deepen, or migrate through the concrete. Dormant cracks remain unchanged. Some dormant cracks, such as those caused by shrinkage during the curing process, pose no danger, but if left unrepaired, they can provide convenient channels for moisture penetration, which normally causes further damage.

Structural cracks can result from temporary or continued overloads, uneven foundation settling, or original design inadequacies. Structural cracks are active if the overload is continued or if settlement is ongoing; they are dormant if the temporary overloads have been removed, or if differential settlement has stabilized. Thermally-induced cracks result from stresses produced by temperature changes. They frequently occur at the ends or corners of older concrete structures built without expansion joints capable of relieving such stresses. Random surface cracks (also called "map" cracks due to their resemblance to the lines on a road map) that deepen over time and exude a white gel that hardens on the surface are caused by an adverse reaction between the alkalis in a cement and some aggregates.

Since superficial repairs that do not eliminate underlying causes will only tend to aggravate problems, professional consultation is recommended in almost every instance where noticable cracking occurs.

Spalling is the loss of surface material in patches of varying size. It occurs when reinforcing bars corrode, thus creating high stresses within the concrete. As a result, chunks of concrete pop off from the surface. Similar damage can occur when water absorbed by porous aggregates freezes. Vapor-proof paints or sealants, which trap moisture beneath the surface of the impermeable barrier, also can cause spalling. Spalling may also result from the improper consolidation of concrete during construction. In this case, water-rich cement paste rises to the surface (a condition known as laitance). The surface weakness encourages scaling, which is spalling in thin layers.

Deflection is the bending or sagging of concrete beams, columns, joists, or slabs, and can seriously affect both the strength and structural soundness of concrete. It can be produced by overloading, by corrosion, by inadequate construction techniques (use of low-strength concrete or undersized reinforcing bars, for example), or by concrete creep (long-term shrinkage). Corrosion may cause deflection by weakening and ultimately destroying the bond between the rebar and the concrete, and finally by destroying the reinforcing bars themselves. Deflection of this type is preceded by significant cracking at the bottom of the beams or at column supports. Deflection in a structure without

widespread cracking, spalling, or corrosion is frequently due to concrete creep.

Stains can be produced by alkali-aggregate reaction, which forms a white gel exuding through cracks and hardening as a white stain on the surface. Efflorescence is a white, powdery stain produced by the leaching of lime from Portland cement, or by the pre-World War II practice of adding lime to whiten the concrete. Discoloration can also result from metals inserted into the concrete, or from corrosion products dripping onto the surface.

Erosion is the weathering of the concrete surface by wind, rain, snow, and salt air or spray. Erosion can also be caused by the mechanical action of water channeled over concrete, by the lack of drip grooves in beltcourses and sills, and by inadequate drainage.

Corrosion, the rusting of reinforcing bars in concrete, can be a most serious problem. Normally, embedded reinforcing bars are protected against corrosion by being buried within the mass of the concrete and by the high alkalinity of the concrete itself. This protection, however, can be destroyed in two ways. First, by carbonation, which occurs when carbon dioxide in the air reacts chemically with cement paste at the surface and reduces the alkalinity of the concrete. Second, chloride ions from salts combine with moisture to produce an electrolyte that effectively corrodes the reinforcing bars. Chlorides may come from seawater additives in the original mix, or from prolonged contact with salt spray or de-icing salts. Regardless of the cause, corrosion of reinforcing bars produces rust, which occupies significantly more space than the original metal, and causes expansive forces within the concrete. Cracking and spalling are frequent results. In addition, the loadcarrying capacity of the structure can be diminished by the loss of concrete, by the loss of bond between reinforcing bars and concrete, and by the decrease in thickness of the reinforcing bars themselves. Rust stains on the surface of the concrete are an indication that internal corrosion is taking place.

PLANNING FOR CONCRETE PRESERVATION

Whatever the causes of deterioration, careful analysis, supplemented by testing, is vital to the success of any historic concrete repair project. Undertaken by experienced engineers or architects, the basic steps in a program of testing and analysis are document review, field survey, testing, and analysis.

Document Review. While plans and specifications for older concrete buildings are rarely extant, they can be an invaluable aid, and every attempt should be made to find them. They may provide information on the intended composition of the concrete mix, or on the type and location of reinforcing bars. Old photographs, records of previous repairs, documents for buildings of the same basic construction or age, and news reports

may also document original construction or changes over time.

Field Survey. A thorough visual examination can assist in locating and recording the type, extent, and severity of stress, deterioration, and damage.

Testing. Two types of testing, on-site and laboratory, can supplement the field condition survey as necessary. On-site, nondestructive testing may include use of a calibrated metal detector or sonic tests to locate the position, depth, and direction of reinforcing bars (see fig. 9). Voids can frequently be detected by "sounding" with a metal hammer. Chains about 30 inches long attached to a 2-foot-long crossbar, dragged over the slabs while listening for hollow reverberations, can locate areas of slabs that have delaminated. In order to find areas of walls that allow moisture to penetrate to the building interior, areas may be tested from the outside by spraying water at the walls and then inspecting the interior for water. If leaks are not readily apparent, sophisticated equipment is available to measure the water permeability of concrete walls.

If more detailed examinations are required, nondestructive instruments are available that can assist in determining the presence of voids or internal cracks, the location and size of rebars, and the strength of the concrete. Laboratory testing can be invaluable in determining the composition and characteristics of historic concrete and in formulating a compatible design mix

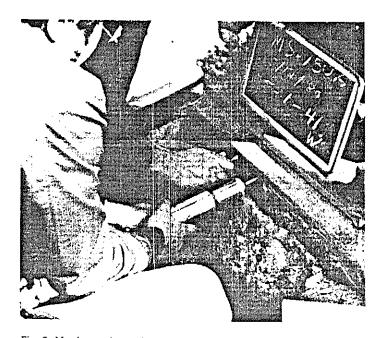


Fig. 9. Nondestructive sonic tests are one way of determining the location and soundness of internal reinforcing bars and the hardness of the concrete. There are a variety of other nondestructive tests provided by professional consultants that will help in the evaluation of the structural integrity of concrete prior to major repair work. Photo: Feld, Kaminetzky and Cohen and American Concrete Institute.

for repair materials (see fig. 10). These tests, however, are expensive. A well-equipped concrete laboratory can analyze concrete samples for strength, alkalinity, carbonation, porosity, alkali-aggregate reaction, presence of chlorides, and past compostion.

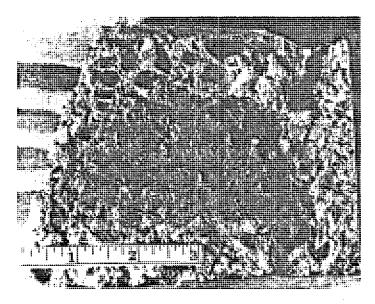


Fig. 10. Testing of actual samples of concrete in the lab may be necessary to determine the strength and condition of the concrete. In this sample, the surface, which is lighter than the sound concrete core, shows that carbonation has taken place. Carbonation reduces the alkalinity in concrete and may hasten corrosion of reinforcing bars close to the surface. Photo: Stella L. Marusin.

Analysis. Analysis is probably the most important step in the process of evaluation. As survey and test results are revised in conjunction with available documentation, the analysis should focus on determining the nature and causes of the concrete problems, on assessing both the short-term and long-term effects of the deterioration, and on formulating proper remedial measures.

CONCRETE REPAIR

Repairs should be undertaken only after the planning measures outlined above have been followed. Repair of historic concrete may consist of either patching the historic material or filling in with new material worked to match the historic material. If replacement is necessary, duplication of historic materials and detailing should be as exact as possible to assure a repair that is functionally and aesthetically acceptable (see fig. 11). The correction and elimination of concrete problems can be difficult, time-consuming, and costly. Yet the temptation to resort to temporary solutions should be avoided, since their failure can expose a building to further and more serious deterioration, and in some cases can mask underlying structural problems that could lead to serious safety hazards (see fig. 12).

Principal concrete repair treatments are discussed below. While they are presented separately here, in practice, preservation projects typically incorporate multiple treatments (see figs. 13a-i).

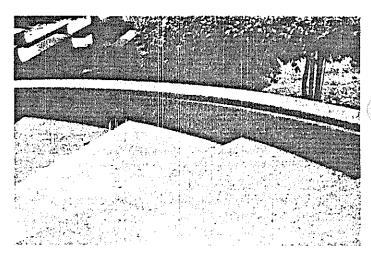


Fig. 11. Meridian Hill, Washington, D.C. (1934). It is important to match the visual qualities, such as color and texture, when repairs or replacement sections are undertaken. In this case, the new replacement step, located second from the left, matches the original pebble-finish surface of the adjacent historic steps. Photo: Sharon C. Park, AlA.

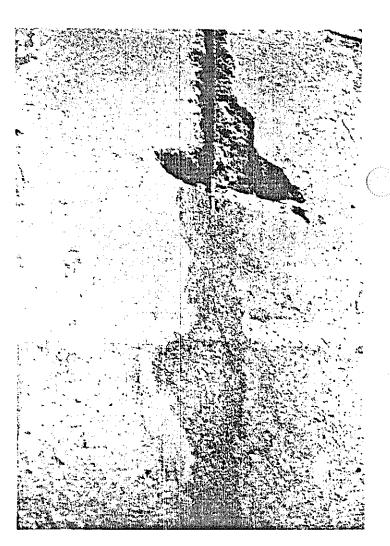


Fig. 12. Without proper preparation and correction of a pre-existing problem, repairs will fail. Insufficient concrete at the surface caused this patch around a reinforcing bar to fail within a year. In this case, a structural engineer should have assessed the need for this rod so close to the surface. Redundant rods are often cut out prior to patching. Photo: Alonzo White.

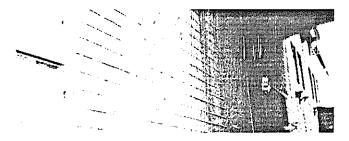


Fig. 13a. Buckling concrete under a painted surface indicates underlying deterioration. It is often difficult to assess the amount of deterioration until the area has been cleaned and examined closely.



Fig. 13c. Narrow cracks often need to be widened to receive concrete patches. Here a pneumatic chisel is being used.

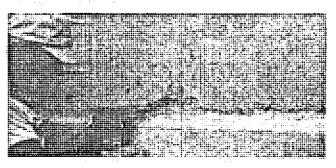


Fig. 13e. A spalled area of concrete has been cleaned back to a sound surface, and is being coated with a bonding agent to increase adherence of the new concrete patch.



Fig. 13g. A soft brush is used to smooth the patch and to blend it with the adjacent historic concrete.

Fig. 13a-i. Virginia Heating Plant, Arlington, Virginia (1941). This reinforced concrete building exhibits several serious problems, including cracking, spalling, and corrosion of reinforcing bars. As a result of careful planning and close supervision, successful repairs have been carried out. Photos: Alonzo White and Sharon C. Park, AIA.



Fig. 13b. Upon removal of the deteriorated surface, a pocket of poorly mixed concrete (mostly sand and gravel) was easily chiseled out. The reinforcing rods were in good condition.



Fig. 13d. Deteriorated or redundant reinforcing bars are removed after evaluation by a structural engineer. An acetylene torch is being used to cut out the bars.

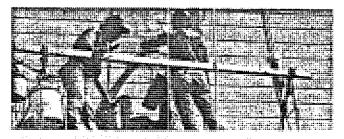


Fig. 13f. Workmen are applying patching concrete and using a trowel to form ridges to match the appearance of the historic concrete ridges that were originally created by the form boards.



Fig. 13h. This active crack at a window sill and in the foundation wall has been filled with a flexible sealant. This area was subsequently painted with a masonry paint compatible with the sealant.

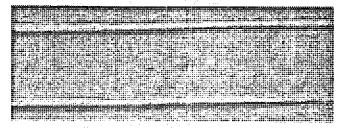


Fig. 13i. Upon completion of all repairs, the building was painted. The finished repair of the deterioration seen in 13a and b is shown in this photograph. The patch matches the texture and detailing of the historic concrete.

Repair of Cracking. Hairline, nonstructural cracks that show no sign of worsening normally need not be repaired. Cracks larger than hairline cracks, but less than approximately one-sixteenth of an inch, can be repaired with a mix of cement and water. If the crack is wider than one-sixteenth of an inch, fine sand should be added to the mix to allow for greater compactibility, and to reduce shrinkage during drying. Field trials will determine whether the crack should be routed (widened and deepened) minimally before patching to allow sufficient penetration of the patching material. To ensure a long-term repair, the patching materials should be carefully selected to be compatible with the existing concrete as well as with subsequent surface treatments such as paint or stucco.

When it is desirable to reestablish the structural integrity of a concrete structure involving dormant cracks, epoxy injection repair should be considered. An epoxy injection repair is made by sealing the crack on both sides of a wall or a structural member with an epoxy mortar, leaving small holes, or "ports" to receive the epoxy resin. After the surface mortar has hardened, epoxy is pumped into the ports. Once the epoxy in the crack has hardened, the surface mortar can be ground off, but the repair may be visually noticeable. (It is possible to inject epoxy without leaving noticeable patches, but the procedure is much more complex.)

Other cracks are active, changing their width and length. Active structural cracks will move as loads are added or removed. Thermal cracks will move as temperatures fluctuate. Thus, expansion-contraction joints may have to be introduced before repair is undertaken. Active cracks should be filled with sealants that will adhere to the sides of the cracks and will compress or expand during crack movement. The design, detailing, and execution of sealant-filled cracks require considerable attention, or else they will detract from the appearance of the historic building.

Random (map) cracks throughout a structure are difficult to correct, and may be unrepairable. Repair, if undertaken, requires removing the cracked concrete. A compatible concrete patch to replace the removed concrete is then installed. For some buildings without significant historic finishes, an effective and economical repair material is probably a sprayed concrete coating, troweled or brushed smooth. Because the original concrete will ultimately contaminate new concrete, buildings with map cracks will present continuing maintenance problems.

Repair of Spalling. Repair of spalling entails removing the loose, deteriorated concrete and installing a compatible patch that dovetails into the existing sound concrete. In order to prevent future crack development after the spall has been patched and to ensure that the patch matches the historic concrete, great attention must be paid to the treatment of rebars, the preparation of the existing concrete substrate, the selection of compatible patch material, the development of good contact between patch and substrate, and the curing of the patch.

Once the deteriorated concrete in a spalled area has been removed, rust on the exposed rebars must be removed by wire brush or sandblasting. An epoxy coating applied immediately over the cleaned rebars will diminish the possiblity of further corrosion. As a general rule, if the rebars are so corroded that a structural engineer determines they should be replaced, new supplemental reinforcing bars will normally be required, assuming that the rebar is important to the strength of the concrete. If not, it is possible to cut away the rebar.

Proper preparation of the substrate will ensure a good bond between the patch and the existing concrete. If a large, clean break or other smooth surface is to be patched, the contact area should be roughened with a hammer and chisel. In all cases, the substrate should be kept moist with wet rags, sponges, or running water for at least an hour before placement of the patch. Bonding between the patch and substrate can be encouraged by scrubbing the substrate with cement paste, or by applying a liquid bonding agent to the surface of the substrate. Admixtures such as epoxy resins, latexes, and acrylics in the patch may also be used to increase bonding, but this may cause problems with color matching if the surfaces are to be left unpainted.

Compatible matching of patch material to the existing concrete is critical for both appearance and durability. In general, repair material should match the composition of the original material (as revealed by laboratory analysis) as closely as possible so that the properties of the two materials, such as coefficient of thermal expansion and strength, are compatible. Matching the color and texture of the existing concrete requires special care. Several test batches of patching material should be mixed by adding carefully selected mineral pigments that vary slightly in color. After the samples have cured, they can be compared to the historic concrete and the closest match selected.

Contact between the patch and the existing concrete can be enhanced through the use of anchors, preferably stainless-steel hooked pins, placed in holes drilled into the structure and secured in place with epoxy. Good compaction of the patch material will encourage the contact. Compaction is difficult when the patch is "laid-up" with a trowel without the use of forms; however, by building up thin layers of concrete, each layer can be worked with a trowel to achieve compaction. Board forms will be necessary for large patches. In cases where the existing concrete has a significant finish, care must be taken to pin the form to the existing concrete without marring the surface. The patch in the form can be consolidated by rodding or vibration.

Because formed concrete surfaces normally develop a sheen that does not match the surface texture of most historic concrete, the forms must be removed before the patch has fully set. The surface of the patch must then be finished to match the historic concrete. A brush or wet sponge is particularly useful in achieving matching textures. It may be difficult to match historic concrete surfaces that were textured, as a result of exposed aggregate for example, but it is important that these visual qualities be matched. Once the forms are removed, holes from the bolts must also be patched and finished to match adjacent surfaces.

Regardless of size, a patch containing cement binder (especially Portland cement) will tend to shrink during drying. Adequate curing of the patch may be achieved by keeping it wet for several days with damp burlap bags. It should be noted that although greater amounts of sand will reduce overall shrinkage, patches with a high sand content normally will not bond well to the substrate.

Repair of Deflection. Deflection can indicate significant structural problems and often requires the strengthening or replacement of structural members. Because deflection can lead to structural failure and serious safety hazards, its repair should be left to engineering professionals.

Repair of Erosion. Repair of eroded concrete will normally require replacing lost surface material with a compatible patching material (as outlined above) and then applying an appropriate finish to match the historic appearance. The elimination of water coursing over concrete surfaces should be accomplished to prevent further erosion. If necessary, drip grooves at the underside of overhanging edges of sills, beltcourses, cornices, and projecting slabs should be installed.

SUMMARY

Many early concrete buildings in the United States are threatened by deterioration. Effective protection and maintenance are the keys to the durability of concrete. Even when historic concrete structures are deteriorated, however, many can be saved through preservation projects involving sensitive repair (see figs. 14a-c), or replacement of deteriorated concrete with carefully selected matching material (see figs. 15a-c). Successful restoration of many historic concrete structures in America demonstrates that techniques and materials now available can extend the life of such structures for an indefinite period, thus preserving significant cultural resources.

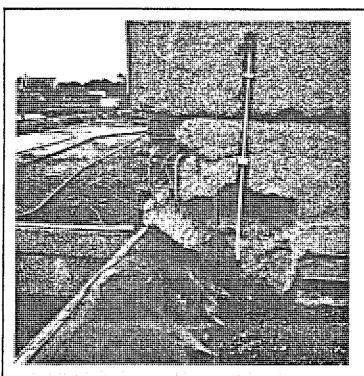


Fig. 14a. Spalled concrete was most noticeable at locations of concentrated rebars. Deteriorated concrete, the 1960s stucco finish, and corrosion were removed by grit-blasting. Photo: Robert Bell.

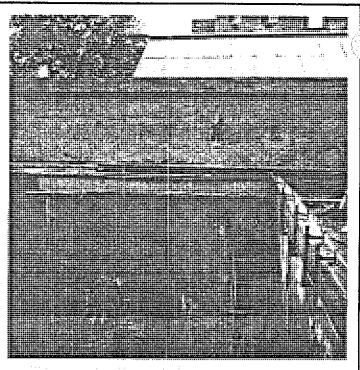


Fig. 14b. Board screeds were attached to the building to recreate the sharp edges of the original detail. Photo: Robert Bell.

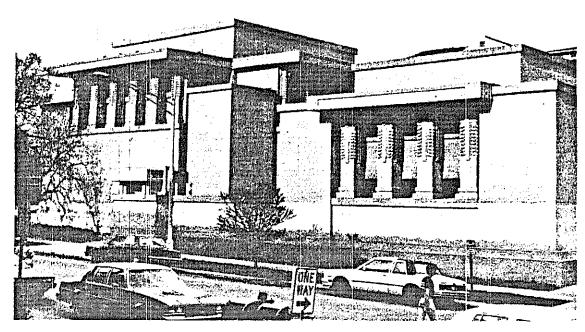


Fig. 14c. Once the repair work was complete, the entire building was sprayed with a concrete mixture consisting of pea-gravel, cement, and sand, which was then hand-

troweled. Finally, the building was lightly grit-blasted to remove the cement paste and reproduce the exposed agregate finish. Photo: Harry J. Hunderman.

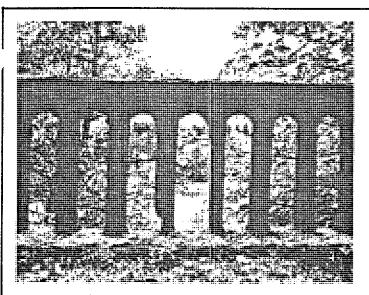


Fig. 15a. The spindle-type railings were deteriorated beyond repair. The concrete was cracked or broken and the center reinforcing rods were exposed and badly rusted.

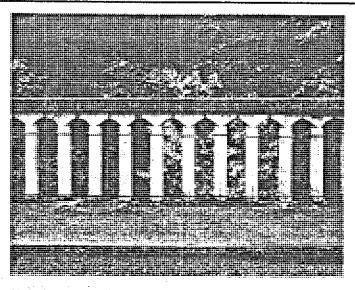


Fig. 15b. Deteriorated spindles were removed. The original 1914 molds were still available and used in casting new concrete spindles, but had they not been available, new molds could have been made to match the originals.

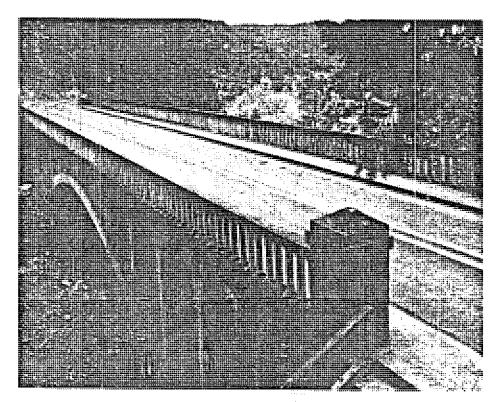


Fig. 15c. The new concrete spindles have been installed. This sensitive renovation reused the historic concrete cap railing and stone piers, as they were still in sound condition.

Fig. 15a-c. Columbia River Highway, Oregon. This historic highway overlooking the Columbia River Gorge was constructed from 1913 to 1922 and contains a number of significant concrete bridges. These photos illustrate the sensitive replacement of the concrete spindle-type balusters on the Young Creek (Shepperd's Dell) Bridge of 1914. Photos: James Norman, Oregon Department of Transportation.

BIBLIOGRAPHY

- Concrete Repair and Restoration. ACI Compilation No. 5. Detroit: American Concrete Institute, 1980. Reprint of Concrete International: Design & Construction. Vol. 2, No. 9 (September 1980).
- Condit, Carl W. American Building: Materials and Techniques from the First Colonial Settlements to the Present. Chicago: University of Chicago Press, 1968.
- Hime, W.G. "Multitechnique Approach Solves Construction Materials Failure Problems." American Chemical Society. Vol. 46, No. 14 (1974).
- Huxtable, Ada Louise. "Concrete Technology in U.S.A." Progressive Architecture. (October 1960).
- Onderdonk, Francis S. The Ferro-Concrete Style. New York: Architectural Book Publishing Company, Inc., 1928.
- Perenchio, W.F., and Marusin, S.L. "Short-Term Chloride Penetration into Relatively Impermeable Concretes." Concrete International. Vol. 5, No. 4 (April 1983), pp. 34-41.
- Pfiefer, D.W., Perenchio, W.F., and Marusin, S.L. "Research on Sealers, Coatings and Specialty Concretes for Barrier Films and Layers on Concrete Structures." Proceedings of the RILEM Seminar on the Durability of Concrete Structures Under Normal Outdoor Exposure, Hanover, Federal Republic of Germany, March 26-29, 1984.
- Pfiefer, D.W. "Steel Corrosion Damage on Vertical Concrete, Parts I & II." Concrete Construction. (February 1981).
- Prudon, Theodore. "Confronting Concrete Realities." Progressive Architecture. (November 1981), pp. 131-137.

- Ropke, John C. Concrete Problems, Causes & Cures. New York: McGraw-Hill. 1982.
- Sabnis, Gajanan, ed. Rehabilitation, Renovation and Preservation of Concrete and Masonry Structures. ACI-SP-85. Detroit: American Concrete Institute, 1985.

This Preservation Brief was prepared under contract with the National Park Service by William B. Coney, Senior Architect for Wiss, Janney, Elstner Associates, Inc. in Northbrook, Illinois. The author would like to thank others who aided in the research and writing of the Brief: William F. Perenchio, Thomas L. Rewerts, Rexford L. Selbe, John Fraczek, and Bruce S. Kaskell, all of Wiss, Janney, Elstner Associates, Inc. Architects Gordon D. Ott, Jr., and Robert A. Bell provided information on the restoration of Milton House and Unity Temple, respectively. Barbara M. Posadas, Department of History, Northern Illinois University, lent her considerable editorial skill to the entire Brief. Tony C. Liu, James R. Cliton, and Michael J. Paul of the American Concrete Institute Committee 364, reviewed and commented on the manuscript, along with Lee H. Nelson, H. Ward Jandl, Kay D. Weeks, Sharon C. Park, and Michael J. Auer of the National Park Service.

This Preservation Brief was edited by Bonnie J. Halda of the National Park Service, Rocky Mountain Regional Office. Comments on the usefulness of this information should be sent to Lee H. Nelson, FAIA, Chief, Preservation Assistance Division, National Park Service, P.O. Box 37127, U.S. Department of the Interior, Washington, D.C. 20013-7127. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the authors and the National Park Service are appreciated.

Cover: Baha'i Temple, Wilmette, Illinois (1933). Photo: William B. Coney.

UNIVERSITY OF CALIFORNIA DAVIS

FEB 28 1989

GUY I. BUCS. - LISRARY

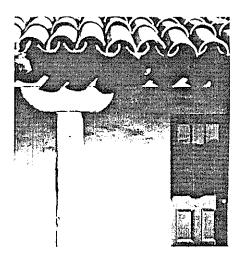
Appendix II: C National Park Service, Preservation Brief No. 30 "The Preservation and Repair of Historic Clay Tile Roofs."

The Preservation and Repair of Historic Clay Tile Roofs

Anne E. Grimmer and Paul K. Williams

U.S. Department of the Interior National Park Service Cultural Resources

Preservation Assistance



Clay tiles are one of the most distinctive and decorative historic roofing materials because of their great variety of shapes, colors, profiles, patterns, and textures. Traditionally, clay tiles were formed by hand, and later by machine extrusion of natural clay, textured or glazed with color, and fired in high-temperature kilns. The unique visual qualities of a clay tile roof often make it a prominent

feature in defining the overall character of a historic building (Fig. 1). The significance and inherently fragile nature of historic tile roofs dictate that special care and precaution be taken to preserve and repair them.

Clay tile has one of the longest life expectancies among historic roofing materials—generally about 100 years,



Figure 1. Clay tiles used as roof covering and as vertical cladding on the third story and gable ends are important in defining the historic character of the Alfred W. McCune Mansion in Salt Lake City. Designed by the architect S.C. Dallas, and completed in 1901, this brick and brownstone structure is a tiled variation of the Shingle style. Drawing: Clay Fraser, HABS Collection.

and often several hundred. Yet, a regularly scheduled maintenance program is necessary to prolong the life of any roofing system. A complete internal and external inspection of the roof structure and the roof covering is recommended to determine condition, potential causes of failure, or source of leaks, and will help in developing a program for the preservation and repair of the tile roof. Before initiating any repair work on historic clay tile roofs, it is important to identify those qualities important in contributing to the historic significance and character of the building.

This Brief will review the history of clay roofing tiles and will include a description of the many types and shapes of historic tiles, as well as their different methods of attachment. It will conclude with general guidance for the historic property owner or building manager on how to plan and carry out a project involving the repair and selected replacement of historic clay roofing tiles. Repair of historic clay tile roofs is not a job for amateurs; it should be undertaken only by professional roofers experienced in working with clay tile roofs.

Historical Background

The origin of clay roofing tile can be traced independently to two different parts of the world: China, during the Neolithic Age, beginning around 10,000 B.C.; and the Middle East, a short time later. From these regions, the use of clay tile spread throughout Asia and Europe. Not only the ancient Egyptians and Babylonians, but also the Greeks and Romans roofed their buildings with clay tiles, and adaptations of their practice continue in Europe to the present. European settlers brought this roofing tradition to America where it was established in many places by the 17th century.

Archeologists have recovered specimens of clay roofing tiles from the 1585 settlement of Roanoke Island in North Carolina. Clay tile was also used in the early English settlements in Jamestown, Virginia, and nearby St. Mary's in Maryland. Clay roofing tiles were also used in the Spanish settlement of St. Augustine in Florida, and by both the French and Spanish in New Orleans.



Fig. 2. Sunnyside, Washington Irving's house in Tarrytown, New York, dates to about 1656. Although extensively remodeled during the years 1836-1849, the stepped gables and tiled roof still reflect the heritage of its original Dutch builders. Photo: Jack E. Boucher, HABS Collection.

Dutch settlers on the east coast first imported clay tiles from Holland. By 1650, they had established their own full-scale production of clay tiles in the upper Hudson River Valley, shipping tiles south to New Amsterdam (Fig. 2). Several tile manufacturing operations were in business around the time of the American Revolution, offering both colored and glazed tile and unglazed natural terra-cotta tile in the New York City area, and in neighboring New Jersey. A 1774 New York newspaper advertised the availability of locally produced, glazed and unglazed pantiles for sale that were guaranteed to "stand any weather." On the west coast clay tile was first manufactured in wooden molds in 1780 at Mission San Antonio de Padua in California by Indian neophytes under the direction of Spanish missionaries (Fig. 3).

By far the most significant factor in popularizing clay roofing tiles during the Colonial period in America was the concern with fire. Devastating fires in London, 1666, and Boston in 1679, prompted the establishment of building and fire codes in New York and Boston. These fire codes, which remained in effect for almost two centuries, encouraged the use of tile for roofs, especially

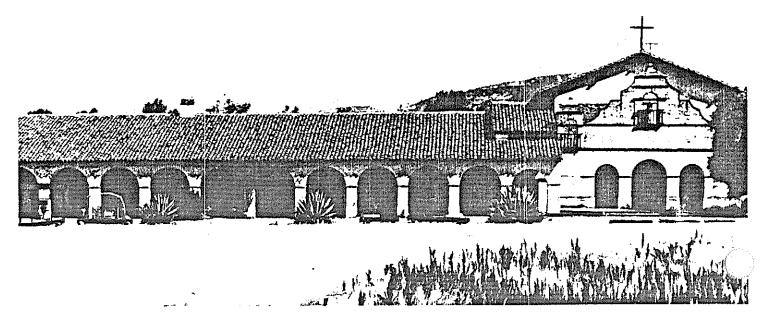


Fig. 3. Clay tiles were first produced on the west coast in 1780 at Mission San Antonio de Padua in Monterey County, California. The present church shown here dates from 1810. Photo: Gene Falk.

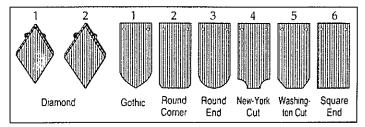


Fig. 4. Many mid- and late-19th century buildings had roofs with uniquely shaped tiles such as fishscale, or another one of the tile shapes that Charles Thomas Davis described as "the six forms of roofing tiles in most common use in this country," and illustrated in his 1884 book A Practical Treatise on the Manufacture of Bricks, Tiles, Terra-Cotta, Etc.

in urban areas, because of its fireproof qualities. Clay roofing tile was also preferred because of its durability, ease of maintenance, and lack of thermal conductivity.

Although more efficient production methods had lowered the cost of clay tile, its use began to decline in much of the northeastern United States during the second quarter of the 19th century. In most areas outside city-designated fire districts, wood shingles were used widely; they were more affordable and much lighter, and required less heavy and less expensive roof framing. In addition, new fire-resistant materials were becoming available that could be used for roofing, including slate, and metals such as copper, iron, tinplate, zinc, and galvanized iron. Many of the metal roofing materials could be installed at a fraction of the cost and weight of clay tile. Even the appearance of clay tile was no longer fashionable, and by the 1830s clay roofing tiles had slipped temporarily out of popularity in many parts of the country.

Revival Styles Renew Interest in Clay Roofing Tiles

By the mid-19th century, the introduction of the Italianate Villa style of architecture in the United States prompted a new interest in clay tiles for roofing. This had the effect of revitalizing the clay tile manufacturing industry, and by the 1870s, new factories were in business, including large operations in Akron, Ohio, and Baltimore, Maryland. Clay tiles were promoted by the Centennial Exhibition in Philadelphia in 1876, which featured several prominent buildings with tile roofs, including a pavilion for the state of New Jersey roofed with clay tiles of local manufacture. Tile-making machines were first patented in the 1870s, and although much roofing tile continued to be made by hand, by the 1880s more and more factories were beginning to use machines (Fig. 4). The development of the Romanesque Revival style of architecture in the 1890s further strengthened the role of clay roofing tiles as an American building material (Fig. 5).

Alternative substitutes for clay tiles were also needed to meet this new demand. By about 1855, sheet metal roofs designed to replicate the patterns of clay tile were being produced. Usually painted a natural terra cotta color to emulate real clay tile, these sheet metal roofs became popular because they were cheaper and lighter, and easier to install than clay tile roofs.

Clay roofing tiles fell out of fashion again for a short time at the end of the 19th century, but once more gained acceptance in the 20th century, due primarily to the popularity of the Romantic Revival architectural styles,



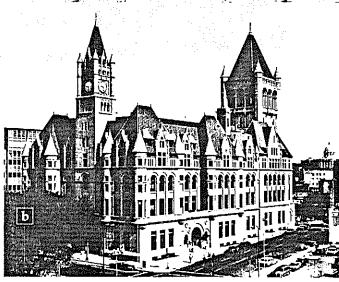


Figure 5. (a) Clay tile was a popular roofing material during the Romanesque Revival period, not only for residential structures including these rowhouses in the Dupont Circle Historic District in Washington, D.C., and designed and built by Thomas F. Schneider between 1889-1892, but also for large-scale public buildings such as (b) the Old Federal Courts Building (1894-1901) in St. Paul, Minnesota, designed by Willoughby J. Edbrooke. Photo: (a) Anne Grimmer, and (b) Winsor/Faricy Architects.

including Mission, Spanish, Mediterranean, Georgian and Renaissance Revival in which clay tile roofs featured prominently. With the availability of machines capable of extruding clay in a variety of forms in large quantities, clay tiles became more readily available across the nation. More regional manufacturing plants were established in areas with large natural deposits of clay, including Alfred, New York; New Lexington, Ohio; Lincoln, California; and Atlanta, Georgia; as well as Indiana, Illinois and Kansas.

The popularity of clay tile roofing, and look-alike substitute roofing materials, continues in the 20th century, especially in areas of the South and West—most notably Florida and California—where Mediterranean and Spanish-influenced styles of architecture still predominate (Fig. 6).



Fig. 6. Like many other house of this period in Florida, the roof of the Chester C. Bolton House in Palm Beach features tiles imported from Cuba. These tiles, with their richly varied earth colors, were often laid in thick cement mortar that was intended to give a ''rustic' appearance. The residence, which includes the main house (1918-1919) designed by James A. Garfield, and an addition built in 1929 designed by Prentice Sanger, has been described as an English manor house with Spanish details. Photo: Jack E. Boucher, HABS Collection.

Early Tiles

During the 17th and 18th centuries the most common type of clay roofing tiles used in America were flat and rectangular. They measured approximately 10" × 6" × 1/2" (25cm × 15cm × 1.25cm), and had two nail or peg holes at one end through which they were anchored to the roofing laths. Sometimes a strip of mortar was placed between the overlapping rows of tile to prevent the tiles from lifting in high winds. In addition to flat tiles, interlocking S-shaped pantiles were also used in the 18th century. These were formed by molding clay over tapered sections of logs, and were generally quite large. Alternately termed pan, crooked, or Flemish tiles, and measuring approximately 14 $1/2" \times 9 1/2"$ (37cm \times 24cm), these interlocking tiles were hung on roofing lath by means of a ridge or lug located on the upper part of the underside of each tile. Both plain (flat) tile and pantile (S-shaped or curved) roofs were capped at the ridge with semicircular ridge tiles. Clay roofing tiles on buildings in mid-18th century Moravian settlements in Pennsylvania closely resembled those used in Germany at the time. These tiles were about 14"-15" long \times 6"-7" wide (36cm-38cm \times 15cm-18cm) with a curved butt, and with vertical grooves to help drainage. They were also designed with a lug or nib on the back so that the tiles could hang on lath without nails or pegs.

The accurate dating of early roofing tiles is difficult and often impossible. Fragments of tile found at archeological sites may indicate the existence of clay tile roofs, but the

same type of tile was also sometimes used for other purposes such as paving, and in bake ovens. To further complicate dating, since clay tile frequently outlasted many of the earliest, less permanent structures, it was often reused on later buildings.

Clay Tile Substitutes

In addition to sheet metal "tile" roofs introduced in the middle of the 19th century, concrete roofing tile was developed as another substitute for clay tile in the latter part of the 19th century (Fig. 7). It became quite popular by the beginning of the 20th century. Concrete tile is composed of a dense mixture of portland cement blended with aggregates, including sand, and pigment, and extruded from high-pressure machines. Although it tends to lack the color permanence and the subtle color variations inherent in natural clay tile, concrete tile continues to be a popular roofing material today because it reproduces the general look of clay tile, if not always the exact profile or proportions of historic clay tile, at a somewhat lower cost and weight. Another modern, slightly cheaper and lighter substitute for clay tile more recently developed consists of a mixture of mineral fiber and cement with pigments added to supply color. While these aggregate tiles also replicate the shape and appearance of clay roofing tiles, they have many of the same dissimilarities to clay tiles that are found in concrete tiles. Thus, like concrete tiles, they are seldom appropriate substitutes for clay tiles.

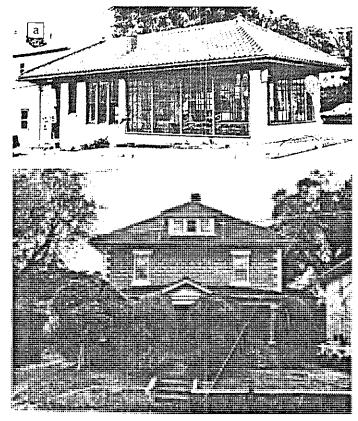




Fig. 7. (a) Metal "tile" roofs of galvanized steel closely resemble the clay tiles they mimic. Often painted to look like terra cotta, their identity can sometimes be revealed by peeling paint or dented "tiles." (b-c) Concrete roofing tiles are generally thicker than clay tiles, and tend to fade and lose their color. Photos: (a-b) Anne Grimmer, (c) National Park Service Files.

Traditional Tile Shapes and Colors

There are two types of clay roofing tiles: interlocking and overlapping. *Interlocking* tiles are designed in pairs so that an extrusion or "lip" on one of the tiles "hooks" over the other tile thereby "locking" or securing the two together; they are also usually nailed to the roof structure. *Overlapping* tiles, which can also function in pairs, generally do not have any sort of "lip" and must be nailed in place. There is a wide range of shapes of historic clay roofing tiles, and many, sometimes with slight variations, are still produced today. There are many variations, and the country of origin of some of them may be revealed in their names, but there are essentially only two kinds of shapes: pantiles and flat tiles. Both pantiles and flat tiles may be either interlocking or overlapping (Figs. 8-9).

Pantiles. The shape most commonly associated with historic clay roofing tiles is probably that of convex or rounded tiles, often grouped together generically as "pan tiles" or "pantiles." These include Spanish tiles—sometimes called "S" tiles, or the similarly shaped Mission tiles, also known as Barrel or Barrel Mission tiles, straight or tapered, as well as Roman tiles, and their Greek variation.

Flat Tiles. Flat, shingle tiles are another type of historic clay roofing tiles. Flat tiles can be completely plain and flat, and, like roofing slates, overlap one another, attached with nails to the roof sheathing. Or they may interlock at the top and on one side. Although the "interlock" holds them together, most interlocking shingle tiles also have one or more holes, usually near the top, for nailing to the roof sheathing. Flat tiles are mostly variations of English or Shingle tiles, and include English Shingle, Closed Shingle, Flat, Shingle or Slab Shingle, as well as French tiles which have a slightly higher and more contoured profile.

Any of the standard tile shapes may be known by a different name in another region of the country, or in different parts of the world. For example, what are known as Spanish or "S" tiles in the United States, may be called Single Roman tiles in England. Sometimes Spanish and Mission tiles are equated despite the fact that the former are usually 1-piece interlocking tiles and the latter are single ½ cylinders that overlap. Since missions and the Mission style are associated with the Americas, Mission tiles in the United States are more commonly referred to as Spanish tiles in England and Europe. In a similar vein, Spanish or "S" tiles, or Barrel tiles, might seem to be more typical of some tiles used in France than what are marketed as French tiles by American manufacturers.

Today some tile manufacturers have given their own trademark name to historic tile shapes. Other companies market uniquely shaped "S" tiles that are more in the shape of a true, but rather low profile "s" without the customary flat portion of traditional American "S" tiles.

Field and Specialty Tile. The tiles that cover the majority of the flat surface of the roof are called *field* tile. Some roof shapes, particularly conical towers or turrets, require tiles of graduated sizes, and some shapes or patterns of field tile also require specially shaped finish tiles to complete the roof covering package. Other uniquely-shaped tiles were made to fit odd-shaped spaces and places including dormers and valleys, roof hips, rakes, ridges and corners. There are also finish tiles that fulfill certain needs, such as eave closures or clay plugs called "birdstops." These are intended to keep out snow and rain, and birds from nesting in the voids under the bottom row of curved tiles. Different patterns and designs can also be created by combining, or mixing and matching flat tiles with dimensional tiles.

Tile Colors. A terra cotta red is the color most commonly associated with historic clay roofing tiles. The reddish color comes from clay with a large percentage of iron oxide, and there are many variations of this natural color to be found in tiles ranging from deep reddish browns to softer and paler oranges and pinks. Lighter buff and beige colors, as well as black, also appear on traditional tile-

Traditional Clay Roofing Tile Shapes and Methods of Attachment		
	Pantiles	
Туре	Average Size	Description
Spanish or "S" Interlocking	13 1/4" long × 9 3/4" wide Exposure: 10 1/4"	Spanish or "S" tiles are 1-piece interlocking tiles with both a convex and a flat, or almost flat, horizontal surface. A raised lip that projects from the edge of the flat portion is designed to interlock with the edge of the convex, barrel end of the adjacent tile. Spanish tiles are usually laid directly on the wood sheathing, or on roofing felt, and fastened by two nails through holes at the top of the tiles, or sometimes mortared in place. Spanish tiles give a roof surface a fairly low and undulating profile.
Tapered or Straight Mission, Barrel, or Barrel Mission Overlapping	14"-18" up to 22"-24" long Each half cylinder about 3" high × about 8" in diameter Exposure: 11"-15"	Tapered or Straight Mission, Barrel, Barrel Mission, or Pan and Cover tile roofs are created with both a concave and a convex ½ cylinder-shaped tile. The concave (pan) tiles are laid first in vertical rows, and nailed directly to the roof sheathing. The convex (cover) tiles are laid to overlap and cover the vertical spaces, or joints, that separate the vertical rows of the concave tiles. The convex tiles may be fastened to the roof sheathing with very long nails, hooks or hangers, or more commonly laid over, and nailed to vertical wood battens underneath. Mission tile roofs have a higher profile than Spanish or Roman tile roofs.
Roman, Pan and Roll, or Pan and Cover Interlocking and Overlapping	12 3/4" long Width from center of 1 cover tile to center of next including width of 1 flat tile is 12" Exposure: 10"	Roman, or Pan and Roll, roofs consist of a two-part tile system which includes a convex barrel cover tile with a rather low profile placed over a flat tile laid directly on the roof sheathing. Like Mission tiles, the convex tiles may be nailed either to battens laid vertically on the roof or directly onto the roof sheathing. Both the convex cover tile and the flat tile may also have nibs at the top by which they interlock with tiles laid in rows above them. Roman tiles may also be cemented in place. A Roman tile roof appears as a series of fairly wide or broad, flat "valleys" alternating with rather low ridges or hills, much like a Spanish tile roof but with wider "flat" sections.
Greek Interlocking and Overlapping	Same size and dimensions as Roman tiles	Greek tiles are essentially a variation of Roman tiles, but the convex tiles that cover the vertical joints between the rows of "pan" tiles are shaped like a gable end or inverted "V". Greek tiles are attached to the roof in the same manner as Roman tiles.
	Flat Tiles	
English Shingle or Closed Shingle Interlocking	English Shingle: 13 1/4" long × 8 3/4" wide Exposure: 10 1/8" long × 7 3/4" wide Closed Shingle: 11" long × 8 3/4" wide Exposure: 8" × 8"	English or Shingle tiles are generally plain and smooth-surfaced, but some are intended to imitate slate or wood shingles and are
English Flat or Slab Shingle Overlapping	12" × 15" long × 6" × 7" wide, or 12" long × 9"-10" wide Exposure varies according to size of the tile, but is generally slightly less than ½ length of the tile	textured accordingly. The underside of these tiles can be either flat and smooth, or may have a corrugated appearance with 4-5 toothlike projections; all are attached with nails.
French	16 1/4" long × 9" wide Exposure: 9"	French tiles feature two deep vertical grooves on the surface that facilitate drainage, and create interesting light and shadow contrasts. A vertical lug projects from the top of these tiles that interlocks with the bottom of the tile laid over it. French tiles also have two nail holes at the top for nailing, and are often given a dab of cement for added security.

ig. 8. Traditional Clay Roofing Tile Shapes and Methods of Attachment. Drawing: Karin Murr Link.

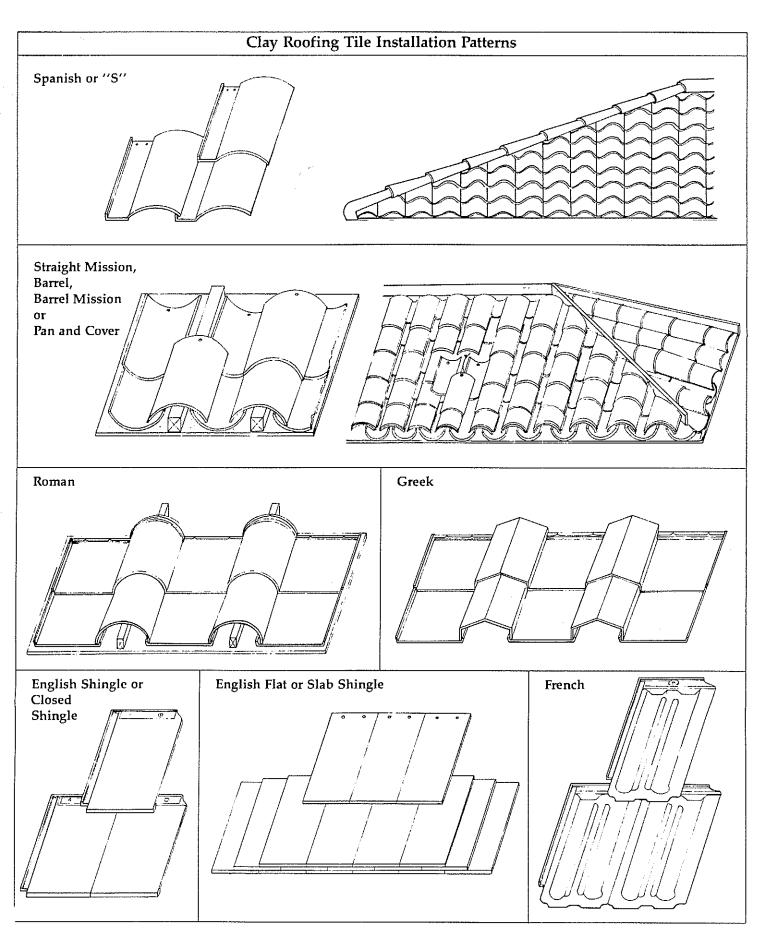


Fig. 9. Clay Roofing Tile Installation Patterns. Drawing: Karin Murr Link.

roofed buildings. Buff-colored tiles were made from nearly pure fire clay, and pouring manganese dissolved in water over the tile before firing resulted in smoke brown or black glazed tiles. Toward the end of the 19th century the popularity of colored glazes for roofing tiles increased, and their use and the range of colors continues to expand today. Most historic glazed roofing tiles are in fairly natural hues that range from reds and browns and buffs, to blacks and purples, blues (often created with smalt, or powdered blue glass), and a wide variety of greens (usually created with copper slag). There could be a considerable range in the colors of tiles that were baked over a wood fire because the temperature within the kiln was so uneven; tiles closest to the fire cooked all the way through and turned a darker red, while tiles farthest from the flames were likely to be smoke-stained, and lighter orange in color.

How Tiles are Attached

The method used to attach clay roofing tiles varies according to the shape, size and style of the particular tile. For the most part, traditional and modern methods of installing clay roofing tiles are very similar, except that modern practice always includes the use of wood sheathing and roofing felt. But most of the earliest clay roofing tiles were laid without benefit of wood sheathing and hung directly on roofing laths and battens that were nailed to the roof rafters; this practice continued up into the mid-19th century in some regions. While this method of attachment allowed for plenty of ventilation, and made it easy to find leaks and make repairs, it also meant that the overall watertightness of the roof depended entirely on the tiles themselves.

Gradually, the practice evolved of nailing roofing tiles directly onto continuous wood sheathing, or hanging them from "nibs" on horizontal lath that was attached to roof rafters or sheathing. Some kinds of tile, especially the later Mission or Barrel tiles were laid over vertical strips or battens nailed to the sheathing, or the tiles were fastened to wood purlins with copper wire.

Partly because they do not always fit together very closely, some tile shapes, including Spanish, Barrel or Mission as well as other types of interlocking tiles, are not themselves completely water-repellent when used on very low-pitched roofs. These have always required some form of sub-roofing, or an additional waterproof underlayer, such as felting, a bituminous or a cementitious coating. In some traditional English applications, a treatment called "torching," involved using a simple kind of mortar most commonly consisting of straw, mud, and moss. The tapered Mission tiles of the old Spanish missions in California were also laid in a bed of mud mortar mixed with grass or straw which was their only means of attachment to the very low-pitched reed or twig sheathing (latia) that supported the tiles (Fig. 10).

More recent and contemporary roofing practices require that the tiles be laid on solid 1" (2.5cm) wood sheathing felted with coated base sheets of at least 30 lbs., or built-up membranes or single-ply roof membranes. This substantially increases the watertightness of the roof by adding a second layer of waterproofing. Horizontal and vertical chalk lines are drawn to serve as a guide in laying

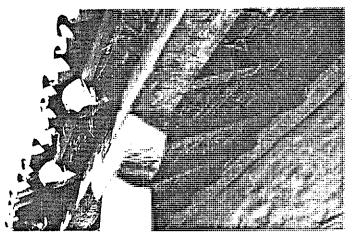


Fig. 10. The underside of this roof on the restored barracks at Santa Cruz Mission reveals the twig sheathing or latia to which the clay tiles were traditionally attached with mud mortar. Photo: Gil Sanchez, FAIA.

the tile and to indicate its patterning. Most tiles are designed with one or two holes so they can be attached by copper nails or hangers, and/or with projecting nibs, to interlock or hang on battens or lath attached to the base sheathing.

Before laying the tiles, the copper or lead gutters, flashings and valleys must be installed, preferably using at least #26 gauge (20-24 ounce) corrosion-resistant metal extending a minimum of 12" (30.5cm) under the tile from the edge, or in accordance with the manufacturer's specifications. The long life and expected durability of clay tiles require that, as with the roofing nails, only the best quality metal be selected for the flashing and guttering.

"Field tile" is usually ordered by the number of "squares"—that is, a flat section 10' x 10' (25cm × 25cm)—needed to cover a roof section. The tile company or roofing contractor should calculate the number of tiles needed according to the type of roof, and based on architect's drawings to ensure accuracy. This should include specialty ridge and eave tiles, decorative trim, partial "squares", approximately 10-20 per cent allowance for breakage, and extra tiles to store for repairing incidental damage later on. Once at the site, the tile is evenly distributed in piles on the roof, within easy reach for the roofers.

The tiles are laid beginning with the first course at the lower edge of the roof at the eaves. The method by which roofing tiles are laid and attached varies, depending on the type and design of the tiles and roof shape, as well as on regional practice and local weather conditions. A raised fascia, a cant strip, a double or triple layer of tiles, or special "birdstop" tiles for under the eaves, may be used to raise the first row of tiles to the requisite height and angle necessary for the best functioning of the roof (Fig. 11). The tile is positioned to overhang the previously installed gutter system by at least 1 1/2" (4cm) to ensure that rainwater discharges into the central portion of the gutter. Once this first course is carefully fitted and examined from the ground level for straightness and color nuances, and adjusted accordingly, successive courses are lapped over the ones below as the roofer works diagonally up the roof toward the ridge. Positioning and laying tiles in a $10' \times 10'$ (25cm \times 25cm) square may take on the average of 16½ man hours.

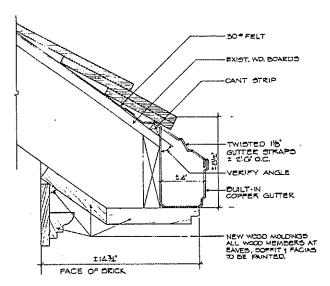


Fig. 11. Both a cant strip and a double layer of tiles are used here to raise the first row of tiles to ensure proper roof drainage. This drawing was prepared for the restoration of the 1911-1912 Jamaica Pond Boathouse, Jamaica Plain, Massachusetts, which is part of the original Boston Park system designed by Frederick Law Olmsted in the late-19th century. Drawing: Richard White, Architect/Planner.

Flat Tiles

Most flat clay tiles have one or two holes located at the top, or on a "nib" or "lug" that projects vertically either from the face or the underside of the tiles, for nailing the tile to the sheathing, battens, or furring strips beneath. As successive rows of tile are installed these holes will be covered by the next course of tiles above. Traditionally, clay tiles on the oldest tile roofs were hung on roofing laths with oak wooden pegs. As these wood pegs rotted, they were commonly replaced with nails. Today, copper nails, 13/4" (4.5cm) slaters' nails, are preferred for attaching the tiles because they are the longest lasting, although other corrosion-resistant nails can also be used. Less durable nails reduce the longevity of a clay tile roof which depends on the fastening agents and the other roofing components, as much as on the tiles themselves. Clay roofing tiles, like roofing slates, are intended to hang on the nails, and nailheads should always be left to protrude slightly above the surface of the tile. Nails should not be driven too deeply into the furring strips because too much pressure on the tile can cause it to break during freeze/thaw cycles, or when someone walks on the roof.

Plain flat tiles, like roofing slates, are attached to the roof sheathing only with nails. They are laid in a pattern overlapping one another in order to provide the degree of impermeability necessary for the roof covering. Because plain flat tiles overlap in most cases almost as much of one half of the tile, this type of tile roof covering results in a considerably heavier roof than does an interlocking tile roof which does not require that the tiles overlap to such an extent. Interlocking flat tiles form a single layer, and an unbroken roof covering. Although most interlocking tiles on all but the steepest roofs can technically be expected to remain in place because they hang on protruding nibs from the roofing laths or battens, in contemporary roofing practices they are often likely to be nailed for added security. In most cases it is usually a good idea to nail at least every other tile (Fig. 12).

Pantiles

With Mission or Barrel tiles, where one half-cylinder overlaps another inverted half-cylinder to form a cover and pan (cap and trough) arrangement, the fastening is more complicated. While the pantiles that rest directly on the sheathing are simply nailed in place, there are two ways of attaching the cover tiles that rest on the pantiles. They can be secured by a copper wire nailed to the sheathing or tied to vertical copper strips running behind the tiles (Fig. 13). Another method requires the installation of vertical battens or nailing strips on the roof to which the cover tiles are nailed, or the use of tile nails or hooks, which are hooked to the pantile below and secured with twisted copper wire.

Sometimes cement mortar, or another underlayer such as grass, moss or straw, or hair-reinforced mortar was added under the tiles. Before the use of felting this was a particularly common practice on some of the plain flat tile or Spanish tile roofs with low rises that were themselves not especially waterproof. Mortar also helped to keep driving rain from getting under the pantiles, and it is still customary in contemporary roofing to add a dab of cement mortar to help secure them (Fig. 14).

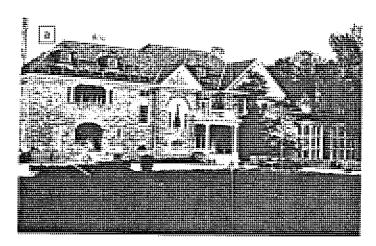
Ridge or Hip Tiles

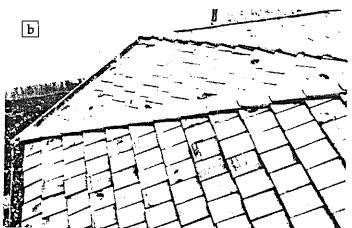
At the roof ridge or hip, clay tile is usually attached to a raised stringer with nails and a small amount of mortar, elastic cement or mastic. The joint is sealed with a flexible flashing such as copper or lead. Ridge tiles are often somewhat larger and more decorative than the field tile utilized on the broad sections of the roof.

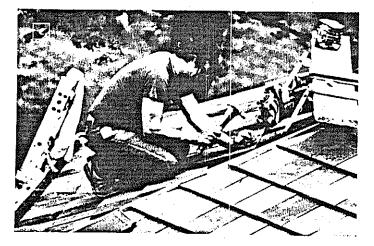
Roof Pitch and Weather are Factors in Tile Attachment

The means by which clay tile is attached to the sheathing is also partly determined by the roof pitch. Generally the fastening requirements increase with an increase of roof pitch. For low-pitched rises of 4"-6" (10cm-15cm) in a 12" (30.5cm) run the weight of the tiles is usually sufficient to hold them in place on the lath by the ridge or "lug" on the underside of the tile, with only the perimeter tiles requiring metal clips to secure them to the sheathing. But the tiles on even these low-pitched roofs are usually nailed for added security, and additional fastening measures are necessary on roofs with a higher pitch, or in areas subject to high winds or earthquakes. For steeper pitched roofs, such as towers, 7"-11" (18cm-28cm), or 12"-15" (30.5cm-38cm) in a 12" (30.5cm) run the tiles are nailed and a band of perimeter tiles three to four tiles thick is secured with clips. For roof rises over 16" (41cm) in a 12" (30.5cm) run, and in areas prone to earthquakes or hurricanes, every tile may be secured with both a nail and a copper or non-corrosive metal clip, and often also with a dab of roofing mastic or mortar.

The installation of clay roofing tiles in areas with significant amounts of snowfall—over 24" (61cm) per year—also varies somewhat from the normal guidelines. Larger battens may be necessary, as well as additional clipping or tying of the tile to securely attach it to the sheathing. The roof structure itself may also need added bracing, as well as the insertion of small snow clips or snow birds that protrude above the surface of the tile to prevent snow and ice from sliding off the roof and damaging the tile.









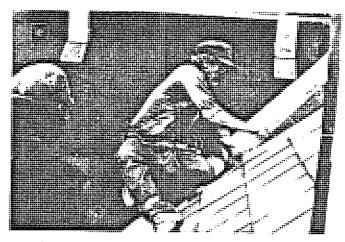
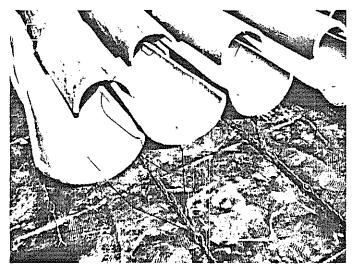




Figure 12. When constructed in Frankfort, Kentucky, in 1900, the Colonial Revival-style Berry Hill Mansion, and its 1912 Music Room addition were both roofed with "Imperial" tiles manufactured by Ludowici-Celadon (a). In 1992 the entire roof was replaced because of deterioration and surface spalling of many of the tiles (b). It was not possible to reproduce the original tiles due to budget limitations, thus Ludowici-Celadon's stock ''Classic Interlocking'' Shingle tiles were selected as replacements which could provide a close, if not exact, match. After tearing off and removing the old tiles, 30 lb. roofing felt was laid over the existing wood sheathing, new lead gutters and valleys were installed, and 90 lb. roll roofing was laid, on which the new tiles were laid. Although most of the field tiles were simply attached by 2 nails to the substrate (c), many of the tiles that had to be cut to fit hips, valleys and dormers were left with only one hole, and had to be wired and then nailed in place (d-e). The exact color and glaze of the original tiles also could not be duplicated because the coloring material is no longer available; however, the new hipped roof terminus for the Music Room roof was custom-made and the replacement field tiles are very similar to the originals (f). The original ridge tiles were designed to "nest" and fit perfectly over the field tiles beneath them whereas the new ridge tiles simply overlap one another, but this is barely perceptible when viewed from the ground. Photos: Edwin C. Krebs, AIA.



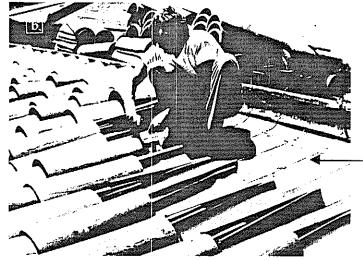


Figure 13 (a-b). These custom-made tapered mission tiles are being attached to the roof using a special system. This consists of twisted 10-gauge brass or copper wires that run up the roof slope through a new treated roof ridge, and down the other side of the roof. These twisted wires are placed about 12" (30.5cm) apart, and diamond shapes are twisted into them every 6" (15cm). The vertical wires are secured with 10-gauge copper or brass anchors approximately every 4' (1.22m) on center depending on the roof slope. Although these tiles would have originally been laid in mud mortar, this method of attachment is particularly successful in seismic areas. The random placement of the tiles accurately replicates the pattern traditionally used on the early missions. Photos: Gil Sánchez, FAIA.

Preservation and Repair

Identifying Common Problems and Failures

While clay roofing tiles themselves are most likely to deteriorate because of frost damage, a clay tile roof system most commonly fails due to the breakdown of the fastening system. As the wooden pegs that fastened the early tiles to hand-riven battens rotted, they were often replaced with iron nails which are themselves easily corroded by tannic acid from oak battens or sheathing. The deterioration of metal flashing, valleys, and gutters can also lead to the failure of a clay tile roof.

Another area of potential failure of a historic clay tile roof is the support system. Clay tiles are heavy and it is important that the roof structure be sound. If gutters and downspouts are allowed to fill with debris, water can back up and seep under roofing tiles, causing the eventual deterioration of roofing battens, the sheathing and fastening system, or even the roof's structural members (Fig. 15). During freezing weather, ice can build up under tiles and cause breakage during the freeze/thaw cycle. Thus, as with any type of roof, water and improperly maintained rainwater removal and drainage systems are also chief causes for the failure of historic clay tile roofs.

Clay tiles may be either handcrafted or machine-made; in general, roofs installed before the end of the 19th century consist of hand-formed tiles, with machine-made tiles becoming more dominant as technology improved during the 20th century. Clay tile itself, whether made by hand or made by machine, can vary in quality from tile to tile. Efflorescence of soluble salts on the surface may indicate that a tile has excessive porosity which results from underburning during its manufacture. Poor quality porous tiles are particularly susceptible to breaking and exterior surface spalling during freeze-thaw cycles. By letting in moisture, porous tiles can permit the roof battens and roof structure to rot. The problem may be compounded by

waterproof building paper or building felt laid underneath which can, in some instances, prevent adequate ventilation.

Clay roofing tiles can also be damaged by roofers walking carelessly on an unprotected roof while making repairs, or by overhanging tree branches, falling tree limbs, or heavy hail. Broken tiles may no longer provide a continuous waterproof surface, thereby allowing water to penetrate the roofing structure, and may eventually result in its deterioration if the broken tiles are not replaced in a timely manner.

Although modern, machine-made clay tiles are more uniform in appearance than their hand-made counterparts, they also have the potential for failure. Occasionally, entire batches of mass-produced tile can be defective.

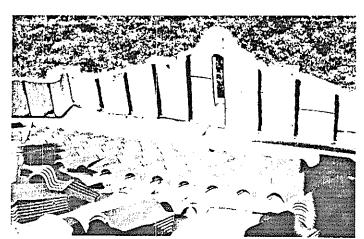


Fig. 14. The Spanish or "S" tiles used to re-roof the Mission Revival style Holy Cross Episcopal Church in Sanford, Florida, have corrugated projections or "teeth" on the underside of the flat portion of each tile which adhere to the cement mortar holding them to the roof sheathing. Photo: Walter S. Marder, AIA.

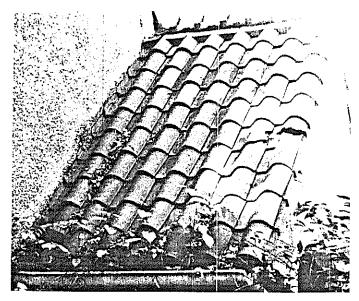




Figure 15. (a) A regular cleaning schedule would have eliminated the plant growth and leaf build-up in this gutter, which, if not removed, will result in serious damage to roof sheathing and structure (b). Photos: (a) Paul K. Williams, and (b) Walter S. Marder. AIA.

Regular Inspection and Maintenance

Broken or missing tiles, or leaks on the interior of the building, are obvious clues that a historic clay tile roof needs repair. Even though it may be clear that the roof is leaking, finding the source of the leak may not be so easy. It may require thorough investigation in the attic, as well as going up on the roof and removing tiles selectively in the approximate area of the roof leak. The source of the leak may not actually be located where it appears to be. Water may come in one place and travel along a roofing member some distance from the actual leak before revealing itself by a water stain, plaster damage, or rotted wooden structural members.

Temporary Protection during Repair

In some instances temporary protection and stabilization may be necessary to prevent further damage or deterioration of a historic clay tile roof. Plywood sheets, plastic, roll roofing, or roofing felt can provide short-term protection until repair or replacement materials can be purchased. Another option may be to erect a temporary scaffold that is encased or covered with clear or semi-transparent polyethylene sheeting over the entire roof. This will not only protect the exposed roofing members during repair or until repairs can be made, but also lets in enough natural light to enable the re-roofing work to take place while sheltering workmen from cold or wet weather.

General Repair Guidance

Once the source and cause of a leak has been identified, appropriate repairs must be made to structural roofing members, wood sheathing, felt or roofing paper if it is part of the roofing membrane, or possibly to vertical roof battens to which the tiles may be attached. If the problem appears limited to gutters and flashing in disrepair, repair or replacement will probably require temporary removal of some of the adjacent tiles to gain access to them. If the roofing tiles are extremely fragile and cannot be walked on even with adequate protection (see below), it may also be necessary to remove several rows or a larger area of tiles and store them for later reinstallation in order to create a "path" to reach the area of repair without damaging existing tiles. Even if most of the tiles themselves appear to be intact but no longer securely attached to the roof substrate due to deterioration of the fastening system or roofing members, all the tiles should be labeled and removed for storage. Regardless of whether the repair project involves removal of only a few damaged tiles, or if all the tiles must be removed and relaid, historic clay roofing tiles are inherently fragile and should be pulled up carefully with the use of a slate ripper. The tiles can be reattached one-by-one with new corrosion-resistant copper nails, copper straps or tabs, "tingles", or another means after the necessary repairs have been made to the roof.

Replacing Individual Tiles

The most difficult aspect of replacing a single broken clay roof tile is doing so without breaking neighboring tiles. While flat shingle tiles can generally be walked on by a careful roofer without likelihood of much damage, high profile pantiles are very fragile and easily broken. By using sheets of plywood, planks, or burlap bags filled with sand to distribute weight, the professional roofer can move about the roof to fix broken tiles or flashing without causing additional damage. Another method involves hooking a ladder on the ridge to support and evenly distribute the weight of the roofer.

A broken tile should be carefully removed with a slate ripper or hacksaw blade inserted under the tile to cut the nail or nails holding it in place. If successive layers of tile are already in place covering the nailholes, it will not be possible to attach the replacement tile with nails through the holes, so an alternative method of attachment will be necessary. By nailing a tab of double thickness copper stripping on the sheathing below the tile, the new replacement tile can be slipped into position and secured in place by bending the copper strip up with a double thickness of the copper over the tile. A slate hook or "tingle" can be used in the same way. This fastening system functions in place of nails (Fig. 16).

When replacing hard-to-match historic tile, and if matching clay tile cannot be obtained, it may be possible to relocate some of the original tiles to the more prominent locations on the roof where the tile is damaged, and insert the new replacement tile in secondary or rear locations, or other areas where it will not show, such as behind chimney stacks, parapets, and dormer windows. Even though replacement tile may initially match the original historic tile when first installed, it is likely to weather or age to a somewhat different color or hue which will become more obvious with time. Thus, care should be taken to insert new replacement tile in as inconspicuous a location as

possible. New, machine-made clay tile or concrete tiles should generally not be used to patch roofs of old, handmade tile because of obvious differences in appearance.

Sources for Replacement Tiles

When restoring or repairing a clay tile roof it is always recommended that as many of the original tiles be retained and reused as possible. Sometimes, particularly when working with "pan and cover" type tile roofs, while many of the "cover" tiles may be broken and require replacement, it may be possible to reuse all or most of the "pan" tiles which are less susceptible to damage than the "cover" tiles. But, in most cases, unless matching replacements can be obtained, if more than about 30 per cent of the roofing tiles are lost, broken, or irreparably damaged, it may be necessary to replace all of the historic tiles with new matching tiles. When counting the number or percentage of missing or broken tiles that need to be replaced, it is important to order extra tiles to allow for breakage and damage during shipping and on the job site. The size of the tiles must be noted, whether they are all the same size, the same size but laid with different amounts of exposure to compensate for changes in perspective, or of graduated sizes according to horizontal rows-typical, for example, on conical or tower roofs (Fig. 17).

Many late-19th and early-20th century tiles are marked on the back with the name of the company that made them, along with the size and the name of that particular tile shape. Some companies that were in business in the United States at the turn of the century are still producing many of the traditional tile shapes, and may be able to supply the necessary replacements. But it is important to be aware that in some cases, although the name of a particular tile pattern may have remained the same, the actual shape, size, thickness and profile may have changed slightly so that the new tile does not match the historic tile closely enough to permit it to serve as a compatible replacement for missing or broken tiles. While such tiles may be acceptable to use on a secondary or less prominent elevation, or to use when an entire tile roof needs replacement, they would not be suitable to use on an area of the roof that is highly visible.

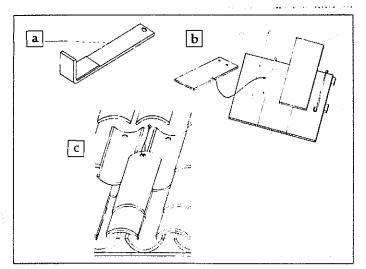


Figure 16. Attachments for repair and replacement of clay tiles include: (a) copper tab, (b) stainless steel or other non-corrosive metal clip, slate hook or 'tingle,' and (c) nailing and wire nailing. Drawing: Karin Murr Link.

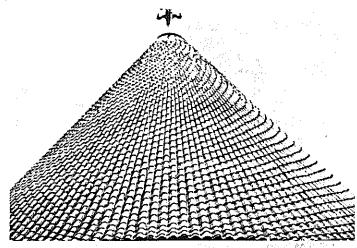


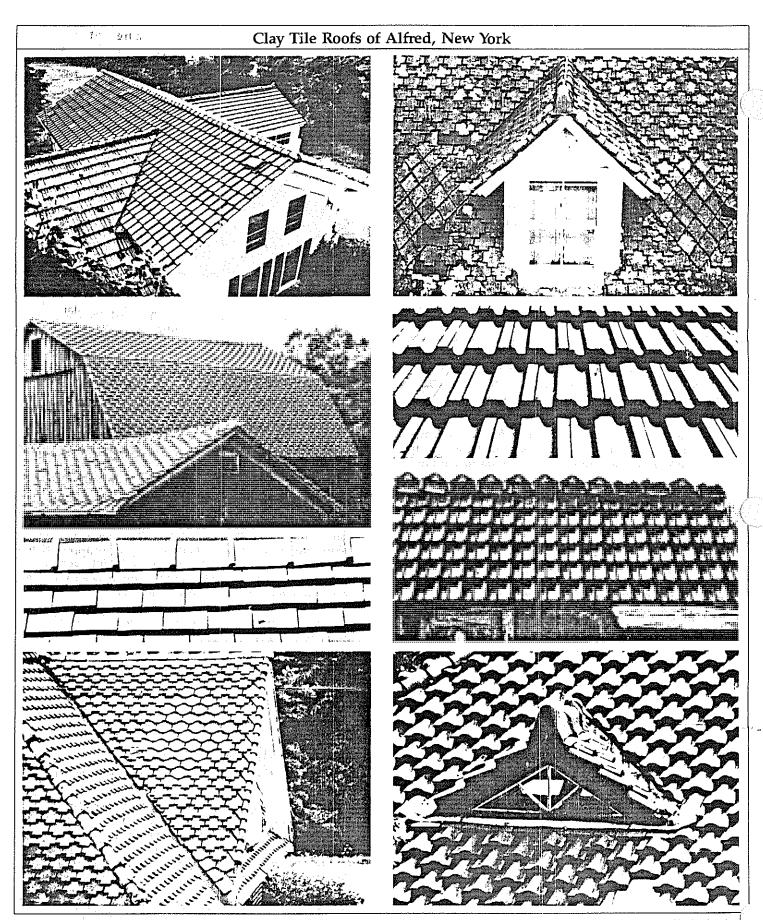
Fig. 17. The rhythm and pattern of these tiles which is so important in defining the character of this roof was created by laying the tiles with different amounts of exposure and using graduated tiles that decrease in size as they reach the top of the cone. Photo: National Park Service Files.

Even if the particular tile is no longer manufactured by a company, the original molds may still exist which can be used to make new tiles to match the historic tiles if the quantity needed is sufficiently large to warrant a custom order. Other companies stock and sell salvaged tile, and keep a variety of old tiles available which can be identified and matched by the number and company imprint on the back of the tiles. Still other companies specialize entirely in custom-made reproduction of historic clay tiles for a specific preservation project.

Modern clay tiles are even more varied than historic tiles. Many shapes and styles are offered in a wide variety of colors and glazes. Several manufacturers produce special color-blended tiles, as well as tiles of different hues that are intended to be carefully mixed when installed. Yet, it is important to remember that many of these modern tiles may not be appropriate for use on historic clay tile roofs. The place of manufacture must also be taken into consideration. For instance, tiles made for use in a hot, dry climate may not be able to withstand wet weather, drastic temperature changes or freeze-thaw cycles. Some of the tile shapes, and many of the colors—especially those that are very bright and highly glazed—are completely contemporary in design, and do not represent traditional American styles, and thus, are not suitable for use on historic buildings.

Repairing a Failed Fastening System

Clay roofing tiles, as noted before, frequently outlast their fastening systems. Wood pegs rot, nails rust, and even copper nails that are not adequately driven in can pull out of the roof's structural members. Although it is unusual that all of the clay tiles on a roof need to be replaced unless matching replacements cannot be obtained, it is not uncommon for old tile roofs to be stripped of all their tiles in order to re-lay the tiles with new fastenings and battens. When the fastening system has failed, all the roof tiles must be removed and reattached with new corrosionresistant fasteners. If possible, all the tiles should be numbered and a diagram should be drawn showing the location of each tile to aid in replicating the original pattern and color variations when the tiles are relaid. Ideally, each tile should be numbered to ensure that it is reinstalled in its original location. But this may not always



Taking advantage of high quality local shale ideal for making terra cotta and clay tiles, the Celadon Terra Cotta Company was established in Alfred, New York in 1889. As a result, an unusually large percentage of historic buildings in this small town are roofed with clay tiles. This includes commercial and residential structures as well as other types of structures not commonly roofed with tile, such as barns and outbuildings. Even early-19th century houses were re-roofed—sometimes incongruously—with clay tiles. Today, the town roofs display an amazing variety of styles and patterns of tiles, many of which may have been factory seconds or experimental designs. In operation for only 20 years when it was destroyed by fire, the company continued manufacturing roofing tiles in New Lexington, Ohio, under the name Ludowici-Celadon. Photos: Terry Palmiter, Courtesy Alfred Historical Society.

be feasible or practical, and it may be enough simply to group the tiles as they are removed by type and size or function—such as field tiles, custom tiles for hips, dormers and ridges, and specially cut pieces. This will help facilitate reinstallation of the tiles. If all of the tiles have to be removed, it is probably a good idea to consider installing a layer of modern roofing felt over the wood sheathing. This will add another layer of waterproofing, while providing temporary protection during re-roofing.

Even if the tiles were originally attached with wooden pegs, it is generally recommended that they be rehung. with corrosion-resistant, preferably heavy copper, or aluminum alloy nails or hooks. Today there are numerous non-traditional fastening systems for clay tile roofs, and many of them are patented. Roofing contractors and architects may have individual preferences, and some systems may be better suited than others to fit a particular roof shape or to meet a specific climatic or seismic requirement. Original battens or other roof members that may have deteriorated should be replaced to match the original using pressure-treated wood. Additional support may be necessary, particularly if the original roof was inadequate or poorly designed.

Replacing Flashing

Deteriorated flashing, gutters and downspouts should generally be replaced in kind to match the historic material. Copper or lead-coated copper, if appropriate to the building, or terne-coated stainless steel, is often preferred for use on historic clay tile roofs because of their durability and long lasting qualities. However, copper staining from downspouts can sometimes be a problem on light-colored masonry walls which should be taken into consideration when planning replacements to rainwater removal systems. Clay tile roofs usually have an open valley system where the tiles are separated by metal flashing at intersections of roof sections with different angles. This makes the insertion of new flashing quite easy, as only a few surrounding tiles must be removed in the process. New copper flashing that is too "bright" can be made to blend in and "mellowed" by brush-coating it with boiled linseed oil or proprietary solutions.

Inappropriate Repairs

The most important repair to avoid is replacing broken or missing roof tiles on a historic building with materials other-than-matching natural clay tiles. Concrete, metal or plastic tiles are generally not appropriate substitutes for clay roofing tiles. They lack the natural color variations of clay tile, and they do not have the same texture, shape, thickness or surface irregularities.

Although much concrete tile and composition tile is produced to resemble the general shape, if not the exact profile, of clay roofing tiles, concrete tile is generally too thick and also lacks the range of colors inherent in natural clay tile. Concrete tile is not a compatible substitute material to repair or replace individual historic clay tiles.

Patching a historic clay tile roof with roofing tar, caulk, asphalt, pieces of metal, or non-matching clay tiles is also inappropriate. Such treatments are visually incompatible. They also have the potential for causing physical damage. Water can collect behind these patches, thus accelerating deterioration of roof sheathing and fastening systems, and during the expansion and contraction of a freeze-thaw cycle ice build-up at patches can break surrounding tiles.

Summary

Clay roofing tile itself, when correctly installed, requires little or no maintenance. Often, it is the fastening system used to secure the tiles to the sheathing that fails and needs to be replaced rather than the tiles themselves. In fact, because clay tiles frequently outlasted the building structure, it was not unusual for them to be reused on another building. When the fastening system has deteriorated, or the roofing support structure has failed, clay tiles can be removed relatively easily, necessary repairs can be made, and the historic tiles can be re-laid with new corrosion-resistant nails or hooks. Broken or damaged tiles should be replaced promptly to prevent? further damage to neighboring tiles or to the roof structure itself.

As with any kind of historic roofing material, regular maintenance, such as cleaning gutters and downspouts, can add to the life of a tile roof. Additional preventive, measures may include placing wire mesh over downspout openings or over the entire gutter to prevent debris from collecting and water from backing up. Periodic inspection of the underside of the roof from the attic after a heavy rain or ice storm for water stains may reveal leaks in their early stages which can be eliminated before they escalate into larger, more serious repair problems.

If replacement tile is required for the project, it should match the original tile as closely as possible, since a historic clay tile roof is likely to be one of the building's most significant features. Natural clay tiles have the inherent color variations, texture and color that is so important in defining the character of a historic tile roof. Thus, only traditionally shaped, clay tiles are appropriate for repairing a historic clay tile roof.

Selected Reading

- Azevedo, J. "Tile Roofing." Fine Homebuilding. No. 60 (April/May 1990), pp. 36-41.
- Belle, John, John Ray Hoke, Jr., and Stephen A. Kliment, editors. Traditional Details for Building Restoration, Renovation, and Rehabilitation. From the 1932-1951 Editions of [Ramsey/Sleeper] Architectural Graphic Standards," New York: John Wiley & Sons, Inc. 1991.
- Davis, Charles Thomas. A Practical Treatise on The Manufacture of Brick, Tiles, Terra Cotta, Etc. Philadelphia: Henry Carey Baird &
- Fidler, John. "Tile, Slate and Stone Roofs." Traditional Homes Technical Information Leaflet. Number 1, 1991.
- Labine, Clem. "How to Repair an Old Roof." The Old-House Journal, Vol. XI, No. 3 (April 1983), pp. 64-69
- Labine, Clem, and Judith Siegel Lief. "The Rise of the" Ornamental Roof," and "Traditional Building's SourceList of Traditional Roofing & Specialties." Traditional Building. Vol. 5, No. 3 (May/June/1992), pp. 35-46.
- Melville, Ian A., and Ian A. Gordon. The Repair and Maintenance of Houses. London: The Estates Gazette Limited, 1973.
- Poore, Patricia. "Tile Roofs." The Old-House Journal. Vol XV, No. 5 (September/October 1987), pp. 22-29.
- "Special Roof Issue." The Old-House Journal, Vol XI, No. 3 (April 1983).

Sweetser, Sarah M. Preservation Briefs 4: Roofing for Historic Buildings. Washington, D.C.: National Park Service, U.S. Department of the Interior, 1978.

Vogel, Neal A. Roofing Houses of Worship: Roofing Guidance for Church and Temple Administrators. Information Series No. 59. Chicago: National Trust for Historic Preservation and Inspired Partnerships, 1992.

White, Richard. Olmsted Park System, Jamaica Plain Boathouse, Jamaica Plain, Massachusetts: Planning for Preservation of the Boathouse Roof, Preservation Case Studies. Washington, D.C.: Heritage Conservation and Recreation Service, U.S. Department of the Interior, 1979.

Selected Sources of Clay Roofing Tiles

Boston Valley Terra Cotta

6860 South Abbott Road Orchard Park, NY 14127

Custom-made architectural terra cotta and clay roofing tiles

C.C.N. Clay Roof Tiles (Canteras Cerro Negro S.A.)

8280 College Parkway, Suite 204

Ft. Myers, FL 33919

Distributors of C.C.N. clay roofing tiles from Argentina

Earth/Forms of Alfred

5704 East Valley Road

Alfred Station, NY 14803

Made-to-order reproduction clay roofing tiles

Gladding, McBean & Co.

P.O. Box 97

Lincoln, CA 95648

Manufacturer since 1875 of terra cotta and clay roofing tiles, and custom reproductions

Hans Sumpf Company, Inc.

40101 Avenue 10

Madera, CA 93638

Made-to-order Mission-style clay roofing tiles

International Roofing Products, Inc.

4929 Wilshire Blvd., Suite 750

Los Angeles, CA 90010

New clay roofing tiles, some suitable for historic buildings

London Tile Co.

65 Walnut Street

New London, OH 44851

Made-to-order reproduction clay roofing tiles

Ludowici-Celadon, Inc.

4757 Tile Plant Road

New Lexington, OH 43764

Manufacturer since 1880s of clay roofing tiles, and custom reproductions

M.C.A. (Maruhachi Ceramics of America, Inc.)

1985 Sampson Avenue

Corona, CA 91719

New clay roofing tiles, some suitable for historic buildings

The Northern Roof Tile Sales Company

P.O. Box 275

Millgrove, Ontario LOR 1VO, Canada

Traditional clay roofing tiles imported from England and South America

Raleigh, Inc.

6506 Business U.S. Route 20

P.O. Box 448

Belvidere, IL 61008-0448

Inventory of new and salvage clay roofing tiles

Supradur Manufacturing Corp.

P.O. Box 908

Rye, NY 10580

Imports Spanish ("S") clay roofing tiles from France

TileSearch

P.O. Box 580

Roanoke, TX 76262

Computerized network for new and salvage clay roofing

United States Tile Company

P.O. Box 1509

909 West Railroad Street

Corona, CA 91718

New clay roofing tiles, some suitable for historic buildings

Note: Measurements in this publication are given in both the U.S. Customary System and International (Metric) System for comparative purposes. Metric conversions are, in some cases, approximate and should not be relied upon for preparing technical specifications.

Acknowledgements

Anne Grimmer is a senior Architectural Historian with the Preservation Assistance Division of the National Park Service; Paul K. Williams is a Cultural Resource Manager with the Air Force. Both authors wish to thank the following individuals for the technical assistance they provided in the preparation of this publication: Edna Kimbro, Architectural Conservator, Watsonville, CA; Edwin S. Krebs, AlA, K. Norman Berry Associates, Louisville, KY; Melvin Mann, TileSearch, Roanoke, TX; Walter S. Marder, AlA, Division of Historical Resources, Tallahassee, FL; Gil Sánchez, FAIA, Gilbert Arnold Sánchez, Incorporated, Santa Cruz, CA; Terry Palmiter and Sandra Scofield, Alfred, NY, and National Park Service professional staff members. In addition, the authors wish to thank Karin Murr Link, who produced the drawings which illustrate this Brief.

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. Comments on the usefulness of this publication may be directed to H. Ward Jandl, Chief, Technical Preservation Services Branch, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127. This publication is not copyrighted and can be reproduced without penalty. Normal procedures for credit to the authors and the National Park Service are appreciated.

ISSN: 0885-7016

Spring 19

Cover photograph: Restoration of the 1820s Indian barracks at Mission Santa Cruz in California included custom-made tapered barrel clay roof tiles based on archeological data found at the site. Photo: Ron Starr Photography.