

**CALIFORNIA HISTORIC MILITARY
BUILDINGS AND STRUCTURES INVENTORY**

**VOLUME III:
HISTORIC CONTEXT: THEMES, PROPERTY TYPES,
AND REGISTRATION REQUIREMENTS**

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LIST OF ACRONYMS^{1/}

A&E	Architect-Engineer
AAF	Army Air Forces
AAFB	Army Air Forces Base
ABM	Anti-Ballistic Missile
ACHP	Advisory Council on Historic Preservation
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFS	Air Force Station
AFSWP	Air Force Special Weapons Project
AMC	Air Mobility Command
ASCE	American Society of Civil Engineers
ATC	Air Transport Command
BEQ	Bachelor Enlisted Quarters
BLM	U.S. Bureau of Land Management
BOMARC	Boeing and Michigan Aeronautic Research Center
BRAC	Base Realignment and Closure
BuDocks	Bureau of Yards and Docks
BUIC	Backup Interceptor Center
Caltech	California Institute of Technology
Caltrans	California Department of Transportation
CB	Construction Battalion
CBC	Construction Battalion Center
CCC	Civil Conservation Corps
CERL	Corps of Engineers Research Laboratory
CFR	Code of Federal Regulations
CHRIS	California Historical Resources Information System
CMECC	California Military Environmental Coordination Committee
COMCABWEST	Commander Marine Corps Air Bases, Western Area
COMNAVBASE	Commander Naval Base, Navy Units
CRMP	Cultural Resources Management Plan
CRPAT	Cultural Resources Process Action Team
DDJC	Defense Distribution Depot San Joaquin
DLA	Defense Logistics Agency
DLI	Defense Language Institute
DoD	Department of Defense
DPR	Department of Parks and Recreation

LIST OF ACRONYMS^{1/}

DRMO	Defense Reutilization and Marketing Office
DSA	Defense Supply Agency
EA	Environmental Assessment
EFA	Engineering Field Activity
EIS	Environmental Impact Statement
EW	Electronic Warfare
FAA	Federal Aviation Administration
FISC	Fleet and Industrial Supply Center
FUD	Formerly Used Defense (Sites)
GGNRA	Golden Gate National Recreation Area
GOCO	Government-Owned, Contractor-Operated (production facility)
GOGO	Government-Owned, Government-Operated (production facility)
GPS	Global Positioning System
GSA	General Services Administration
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HARP (Plan)	Historic and Archaeological Resources Protection (Plan)
HPMM	Historic Preservation and Maintenance Manual
HPP	Historic Preservation Plan
HRI	Historic Resources Inventory
IBM	Industrial Business Machines
ICBM	Intercontinental Ballistic Missile
ICRMP	Integrated Cultural Resources Management Plan
ILWU	International Longshoreman's Workers Union
INS	Immigration and Naturalization Service
IRBM	Intermediate Range Ballistic Missile
LRA	Local Redevelopment Authority
LTA	Lighter-Than-Air
MATS	Military Air Transport Service
MCAGCC	Marine Corps Air Ground Combat Center
MCAS	Marine Corps Air Station
MCMWTC	Marine Corps Mountain Warfare Training Center
MCRD	Marine Corps Recruit Depot
MFA	Moffett Federal Airfield
MIT	Massachusetts Institute of Technology
MOA	Memorandum of Agreement
MWR	Morale, Welfare and Recreation
MWTC	Marine Warfare Training Center

LIST OF ACRONYMS^{1/}

N&MRC	Naval and Marine Reserve Center
NAAS	Naval Auxiliary Air Station
NAB	Naval Amphibious Base
NACA	National Advisory Committee for Aeronautics
NAD	Naval Aviation Depot
NAF	Naval Air Fields
NAS	Naval Air Station
NASA	National Aeronautics and Space Administration
National Register	National Register of Historic Places
NAVFACENCOM SW DIV	Naval Facilities Engineering Command Southwest Division
NAVSOC	Naval Special Operations Command
NAVSTA	Naval Station
NAWS	Naval Air Weapons Station
NCO	Non-Commissioned Officer
NCS	Naval Communication Station
NCSHPO	National Conference of State Historic Preservation Officers
NEL	Naval Electronics Laboratory
NEPA	National Environmental Protection Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NORAD	North American Air Defense
NOTS	Naval Ordnance Test Station
NPS	National Park Service
NRC	Naval Reserve Center
NRRF	Naval Radio Receiving Facility
NSD	Naval Supply Depot
NTC	Naval Training Center
NTS	Naval Training Station
NUC	Naval Undersea Center
NWS	Naval Weapons Station
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
PA	Programmatic Agreement
PAVE PAWS	Perimeter Acquisition Vehicle Entry Phased Array Warning System
PMOA	Programmatic Memorandum of Agreement
POW	Prisoner-of-War
PWC	Public Works Center
R&D	Research and Development

LIST OF ACRONYMS^{1/}

RDT&E	Research, Development, Testing and Evaluation
SAC	Strategic Air Command
SAGE	Semi-Automatic Ground Environment
SALT	Strategic Arms Limitation Talks
SCI	San Clemente Island
SDI	Strategic Defense Initiative
Seabee	Construction Battalion
SERE	Survival, Evasion, Resistance and Escape
SHPO	State Historic Preservation Officer
SNI	San Nicolas Island
SNORT	Supersonic Naval Ordnance Research Track
SSC	Space and Naval Warfare Systems Center
SSTB	Salton Sea Test Base
Statewide Inventory	Statewide Historic Buildings and Structures Inventory
T&E	Testing and Evaluation
UCLA	University of California, Los Angeles
USACE	U.S. Army Corps of Engineers
VAL	Variable Angle Launcher
V-J	Victory over Japan
VLAP	Vietnam Laboratory Assistance Program
WPNSTA	Weapon Station

^{1/} This list contains acronyms used in Volumes I, II, and III of the *California Historic Military Buildings and Structures Inventory* (Statewide Inventory).

PREFACE

This is Volume III of the four-volume series *California Historic Military Buildings and Structures Inventory* (Statewide Inventory), which reports the results of the Statewide Historic Buildings and Structures Inventory for Department of Defense (DoD) Installations. The Statewide Inventory is a program that was developed by the California Military Environmental Coordination Committee (CMECC) to respond to the need for better coordination between the military service branches in conducting historic buildings and structures evaluations at military installations. This need is particularly important, given the number of large-scale inventories being done for military base closures in California. The CMECC, through its Cultural Resources Process Action Team (CRPAT), believed that the service branches could achieve better consistency in evaluating historic buildings and structures at military bases by taking a statewide and interservice approach. Such a coordinated approach would help in avoiding the pitfalls of over-representing or under-representing important time periods or historic themes in National Register of Historic Places (National Register) nominations.

This coordinated approach would have three key ingredients: 1) a stock-taking of previous work that would assess the amount of survey completed and the types of properties found to meet National Register criteria, 2) preparation of an historic themes and contexts statement for the entire state and all four service branches, and 3) an understanding of some key property types that best exemplify the most important time periods and historic themes of California military history.

These program elements were completed in three phases of work. Phase I was an effort to collect and classify all previous studies of California DoD buildings and structures inventories. Hundreds of inventories were collected and analyzed in conjunction with this effort. Volume I, titled "Inventories of Historic Buildings and Structures on California Military Installations," reports the results of Phase I. It includes an installation-by-installation assessment of inventory completeness, and an analysis of the historic buildings and structures found to date to meet National Register criteria in terms of such characteristics as their period of significance and their general function and specific use types.

Phase II's objective was to establish a wider perspective on significant events and themes in California's military history. Phase II resulted in Volume II, an interservice and region-wide history and historic themes statement, titled "The History and Historic Resources of the Military in California, 1769-1989." Volume II provides a fabric for understanding the significance of the properties found to meet National Register criteria in past studies, and should serve as a guide for future studies taking the interservice and statewide context approach.

Phase III's goal was to synthesize the data from the first two phases to present a detailed discussion of historic themes, property types, and registration requirements for military-related buildings and structures in the state. The resulting Volume III (this volume) is titled "Historic Context: Themes, Property Types, and Registration Requirements". It brings the analysis of inventoried historic properties together with the historic themes statement, by discussing key or representative property types that exemplify the historic character of a given time period and theme or that memorialize the events and themes of that period. It gives examples of properties belonging to these types that researchers have found to meet National Register criteria. This volume also discusses the registration requirements for these key property types. It is hoped that this volume will prove useful for evaluating potential historic significance for military-related buildings and structures, taking into account the body of work previously accomplished, as well as the broader themes that define the significant aspects of the history of the military in California.

A fourth volume contains, as appendices to the other volumes, the two key data tables used in the study and analyzed in Volume I. These are the "Inventories and Documents Data Table," with information about each of the past studies done (Appendix C), and the "Historic Properties Data Table," which contains information about all properties on California military installations found, to date, to meet National Register criteria (Appendix D). This volume also contains a concordance of current and historic installation names (Appendices A and B).

The Statewide Inventory should serve as a guide to future research, as DoD completes the inventory of historic buildings and structures at California installations. This remaining inventory is required to meet National Historic Preservation Act (NHPA) Section 106 requirements as closing bases prepare for transfer, and to meet the NHPA Section 110 mandate that federal agencies take stock of historic properties under their management. As this program moves forward, it will help DoD achieve its overall goal of preserving our heritage while safeguarding our future. The program will also allow the California State Historic Preservation Officer (SHPO) to make more comprehensive evaluations of DoD historical resources in compliance with Section 106 of the NHPA.

The Statewide Inventory is being conducted with funding from the DoD Legacy Resources Management Program. Participating agencies in the CMECC's CRPAT include the four military service branches (Army, Navy, Marine Corps, Air Force), Advisory Council on Historic Preservation (ACHP), California Office of Historic Preservation (OHP), National Park Service (NPS), and Governor's Office of Planning and Research (OPR). See Volume I for a more detailed introduction to the program and a list of the program's contributors and participants by name.

1.0 INTRODUCTION

This volume represents a synthesis of two earlier phases of work on the *California Historic Military Buildings and Structures Inventory* (Statewide Inventory), as described in the Preface. It analyzes the range of historic property types known to occur, or that may occur, on military installations in California, and offers examples and registration requirements that may be used to evaluate the property types in the future. Property types are discussed by era and historic theme. The eras comprise distinct phases in the military history of California, and are consistent with the eras described in Volume II of the Statewide Inventory. The themes represent important historic developments within each era.

1.1. WHAT IS AN HISTORIC CONTEXT?

This approach follows the formal outline of a historic context, as the term is used in Federal historic preservation regulations and guidelines. The term “historic context” has both a common sense and a formal, regulatory meaning. In the common sense definition, historic context is simply a matter of perspective. All valid historical conclusions result from putting facts into context, from standing back to see the “big picture.” The formal meaning of historic context comes from an effort by the Secretary of the Interior to ensure properties are inventoried and evaluated within the context of larger historic patterns. The formal definition is simply an attempt to codify longstanding practices within the historic and architectural historic professions.

In “Secretary of the Interior’s Standards for Historic Preservation Planning,” the formal use of a historic context is described as follows:

The historic context is the cornerstone of the planning process. The goal of preservation planning is to identify, evaluate, register and treat the full range of properties representing each historic context, rather than only one or two types of properties. The use of historic contexts in organizing major preservation activities ensures that those activities result in the preservation of the wide variety of properties that represent our history, rather than only a small, biased sample of properties.¹

¹ The term “historic context” is used throughout the guidelines and standards of the National Register program. This definition comes from Department of the Interior, “Archeology and Historic Preservation: Secretary of the Interior’s Standards and Guidelines,” under “Standards for Preservation Planning,” subsection “Developing Historic Contexts.” *Federal Register*, 48, No. 190, September 29, 1983.

A historic context is built around three variables: theme, place, and time. Regarding military properties in California, the overarching theme is military preparedness. The place consistently is California; this historic context is deliberately statewide in its focus. The chronological eras in this context include seven distinct periods: the Colonial Era (1789-1846); the Frontier Era (1846-1865); the Traditional Era (1866-1902); the Modernization Era (1903-1918); the Interwar Era (1919-1938); World War II, including pre-war build-up (1939-1945); and the Cold War Era (1946-1989).

Within each chronological era, it is possible to identify historic themes unique to the period, or that represent different patterns from one period to the next. For example, a theme from the Modernization Era (1903-1918) includes the adoption of the radio as a means of communication (see Section 5.5). This was a development of profound impact on all branches, especially the Navy. The theme is unique to that period; the radio was only introduced once. Other themes are represented in different eras. The construction of coastal defense batteries, for example, was an important theme from the Frontier Era through World War II, even though the types of batteries differed substantially from one period to the next (see Sections 3.4, 4.3, 5.8, 6.9, and 7.11).

In addition to theme, place, and time, a historic context relies upon the concept of a “property type” for practical applications. As stated in the “Secretary of the Interior’s Standards”:

Historic contexts, as theoretical constructs, are linked to actual historic properties through the concept of property type. Property types permit the development of plans for identification, evaluation and treatment even in the absence of complete knowledge of individual properties.²

A property type is simply a building, structure, site, or other type of property known to have been associated with a historic theme. The aforementioned theme – the military adoption of the radio in the early 20th century – resulted in construction of a predictable property type: the radio transmitting and receiving station (Section 5.5.1). Knowing the Navy quickly adopted radio communication in the early 1900s, we can easily predict the Navy also built radio receiving and transmitting stations during the period. Recognizing the importance of this development to the Navy gives us a measure for the significance of any resources that may be associated with that theme. The Naval Radio Transmitting Station at Chollas Heights in San Diego, which included buildings from the 1910s, was a significant example of that property type, which, in turn, is

² Department of the Interior, “Archeology and Historic Preservation: Secretary of the Interior’s Standards and Guidelines,” under “Standards for Preservation Planning,” subsection “Developing Historic Contexts.”

significantly associated with a key development in the Navy's command and communication systems.

1.2. ORGANIZATION OF THIS VOLUME

This volume is divided into eight chapters: this introduction and seven chapters addressing each of the seven chronological eras. For each of the chronological eras, the chapter identifies a series of themes that capture the important developments of that era in California's military history. Using a previous example, the adoption of the radio is treated as an important theme in the early 20th century history of the military (Section 5.5). The theme does not appear in earlier sections, of course, because the radio did not exist. The theme is of lesser importance in later years because it was no longer a new or emerging technology, although the importance of the radio as a communication tool has not diminished through the years. Property types are identified that illustrate or are associated with each theme. A radio transmitting station and a school for radio operators, for example, is a property type associated with the theme of early use of the radio in the early 1900s.

For each property type, the section identifies the known examples of that property type and identifies whether or not the example has been listed in the National Register. The Naval Radio Transmitting Station, Chollas Heights was an example of this property type and it was found to meet the criteria for listing in the National Register as a small historic district. The Naval Radio Station, Point Loma, built even before the Chollas Heights facility, was also an example. It, however, was not found eligible for listing in the National Register because there are apparently no buildings or structures remaining from the early 20th century station. The Chollas Heights buildings have also been demolished, but they were found to qualify for the National Register and were recorded to the Historic American Buildings Survey/Historic American Engineering Records [HABS/HAER] standards prior to demolition.

Finally, for each property type, there is a discussion of registration requirements for that property type. The term "registration requirements" deserves some discussion because it is a little-used term in historic preservation planning, although the concept is founded in the "Secretary of the Interior's Standards for Evaluation" and "Secretary of the Interior's Standards for Preservation Planning." The term is also used in the Keeper of the National Register's "How to Complete the

National Register Multiple Property Documentation Form.”³ The term literally means requirements for listing in the National Register. The practical consideration for each property type is: Given our understanding of the importance of this property type, which qualities should be present in an example of the property type to warrant listing in the National Register?

“Registration requirements” differ from one property type to the next. National Register eligibility hinges on a large number of factors; the Keeper of the National Register has written dozens of volumes of guidelines to explore the many ways in which any given property may qualify for the National Register. Even within this analytical framework, however, there is room for disagreement as to whether any given example of a property type does or does not qualify for the National Register. The “registration requirements” discussion for each property type in this volume attempts to identify the qualities that should be present to qualify a given property for listing in the National Register. Three qualities dominate most discussions of registration requirements: strength of association, rarity, and integrity. Section 1.4, below, offers four examples of how strength of association, rarity, and integrity help define significance for an example of a specific property type.

1.3. SOURCES USED TO DEVELOP REGISTRATION REQUIREMENTS

The registration requirements presented in this volume (Volume III) rely on national contexts, broad historic properties studies, hundreds of cultural resource inventories, as well as extensive reading in general texts on specific subjects or themes. The subject matter is so huge, it is likely there are important historic themes and property types not treated in this report. Some omissions are the result of oversight, as they did not occur to the preparers of this report; others are deliberate. The list of potential property types is almost infinite, depending upon how buildings and structures are grouped. Judgement was exercised in listing historic themes and property types that can serve as the basis for informed National Register evaluations.

DoD has funded a number of excellent nationwide context studies that were used to develop the registration requirements for property types, presented in this volume. These include contextual studies of:

³ Keeper of the National Register, “How to Complete the National Register Multiple Property Documentation Form,” n.d., available on-line at www.nr.nps.com. The multiple property documentation form establishes a context for evaluating groups of properties united by theme and place; in a sense, this volume is multiple property documentation form for military properties in California. The Keeper’s guidelines for Multiple Property Documentation explains better than any other National Park Service publication the meaning and use of the term, registration requirements.

- Radar installations and other early warning devices from the Cold War⁴
- Guided missile-related properties of the Navy⁵
- Guided missile-related properties of the Army and Air Force⁶
- Government-owned munitions production facilities⁷
- Air Force Air Combat Command properties nationwide⁸
- World War II-era permanent buildings⁹
- World War II-era temporary buildings¹⁰
- Navy Reserve buildings nationwide¹¹
- Army officers' quarters, nationwide, 1866 through 1940¹²
- "Utility" buildings from 1917 through the end of World War II¹³
- High-speed test tracks¹⁴

These national contexts are arguably the most important resources in understanding the range of property types that may be associated with these important themes. A problem with these contexts is there are too few of them. Their usefulness is also limited by the fact they focus almost exclusively on the Cold War and, to a lesser degree, World War II. On the other hand, the majority of DoD buildings, as well as the majority of buildings not yet inventoried or evaluated, were built after 1940.

⁴ David F. Winkler, "Searching the Skies: The Legacy of the United States Cold War Defense Radar Program," Prepared for the United States Headquarters Air Combat Command, June 1997.

⁵ R. Christopher Goodwin & Associates, Inc., "Navy Cold War Guided Missile Context: Resources Associated with the Navy's Guided Missile Program," Prepared for the Department of the Navy, Atlantic Division, Naval Facilities Engineering Command, August 1995.

⁶ John C. Lonquest and David F. Winkler, "To Defend and Deter: The Legacy of the United States Cold War Missile Program," USACERL Special Report 97/01, November 1996.

⁷ Dr. Philip Shiman, "Forging the Sword: Defense Production During the Cold War," USACERL Special Report 97/77, July 1997.

⁸ Mariah Associates, Inc., "Air Combat Command and the Legacy of the Cold War: A Systemic Study of Air Combat Command Cold War Material Culture," October 1997.

⁹ R. Christopher Goodwin & Associates, "(Draft) Historic Context for Department of Defense Facilities, World War II Permanent Construction," Prepared for the Army Corps of Engineers, Baltimore District, June 1994.

¹⁰ John S. Garner, "World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States," USACERL Technical Report CRC-93/01, March 1993.

¹¹ Hardy-Heck-Moore, "Cultural Resources Survey and Assessment of Naval Reserve Centers in Southwest Division, Engineering Field Activity West, Engineering Field Activity Northwest, Pacific Division, Atlantic Division, Naval Facilities Engineering Command," 1998.

¹² Bethany Grashof, "A Study of United States Family Housing: Standardized Plans, 1866-1940," 1986.

¹³ R. Christopher Goodwin & Associates, Inc. "Support and Utility Structures and Facilities (1917-1946): Overview, Inventory and Treatment Plan," May 31, 1995.

¹⁴ JRP Historical Consulting Services, "High-Speed Test Tracks at the Naval Air Weapons Station, China Lake," December 1999. This study focuses on the tracks at China Lake but presents a national context.

The World War II studies are unique among military contexts in that several were prepared in relation to a nationwide Programmatic Agreement (PA), signed by the ACHP and the National Conference of State Historic Preservation Officers (NCSHPO). In 1986, the ACHP and NCSHPO agreed that World War II temporary buildings would be studied programmatically. In the same document, the ACHP and NCSHPO agreed that World War II temporary buildings could be demolished by the military without further Section 106 review.¹⁵

In addition to the formal historic contexts sponsored by the DoD, there exists a handful of very useful studies of particular historic themes that help define the parameters of registration requirements for related property types. For example, NPS has prepared several excellent overviews of specific themes as part of its management responsibilities. In the late 1970s, NPS accepted responsibility for several major coastal defense properties in San Francisco and Marin counties. In anticipation of this responsibility, the agency prepared “Historic Resource Study, Seacoast Fortifications, San Francisco Harbor.”¹⁶ While ostensibly restricted to the San Francisco Bay Area, the study actually supplies information useful in evaluating coastal defense properties throughout California. NPS also generated many studies in preparation for management of the Presidio of San Francisco.¹⁷ These studies are so complete that they form the basis for conclusions about the Army in the 19th century in all parts of California. Lois Craig and others prepared an excellent study of the architecture of the Federal government. Although this study rarely deals with military buildings, it provides a useful context for the general traditions of the Federal government, which affected military design to a considerable degree.¹⁸

The registration requirements conclusions are also based upon the hundreds of building and structures inventories listed in the Inventories and Documents Data Table (Appendix C in Volume IV). Nearly all of these studies attempt to establish some sort of context for the specific properties in question. Some, however, are particularly useful in this regard. Air Force studies of Intercontinental Ballistic Missile (ICBM), Strategic Air Command (SAC), and radar sites offer excellent information beyond even the information in the national contexts.¹⁹ Inventories of

¹⁵ The terms of the Programmatic Agreement are discussed in detail in Garner, “World War II Temporary Military Buildings,” 1993.

¹⁶ Erwin N. Thompson, “Historic Resource Study, Seacoast Fortifications, San Francisco Harbor, Golden Gate National Recreation Area, California,” May 1979.

¹⁷ These are summarized in National Park Service, “Presidio of San Francisco National Historic Landmark District,” 1993

¹⁸ Lois A. Craig, *The Federal Presence: Architecture, Politics and National Design*. Cambridge, MA: MIT Press, 1984.

¹⁹ See especially: Tri-Services Cultural Resources Research Center, “Cold War Properties Evaluation – Phase I, Inventory and Evaluation of Launch Complexes and Related Facilities at Vandenberg Air Force Base, California,” February 1996; Tri-Services Cultural Resources Research Center “Cold War Properties Evaluation – Phase II, Inventory and Evaluation of Minuteman, MX Peacekeeper and Space Tracking Facilities at Vandenberg Air Force

architecturally significant properties add great insight into the manner in which government architects and private architects designed and built military buildings at various periods of time.²⁰

1.4. HOW THIS VOLUME MAY BE USED TO EVALUATE MILITARY PROPERTIES IN CALIFORNIA

If one trend characterizes California military history, it is technological innovation. From the first Curtiss biplane aircraft tests at North Island in 1911 to the first jet aircraft tests of the XP-59A at Edwards Air Force Base (AFB) in 1943, to the invention of the Sidewinder missile at Naval Air Weapons Station (NAWS) China Lake in the 1950s, California military planners have long been daring advocates of the new and untested.

This report is in some respects experimental, as well. It is one of the more ambitious historic contexts written for any purpose and is a comprehensive look at historic military properties. The experimental nature of this report is a fitting tribute to the history of the military in California. While obviously not as daring as the XP-59A or the Sidewinder, it does represent several innovations in the field of cultural resource management.

These innovations may be succinctly summarized, as follows:

- In terms of historic preservation planning for the military, it is the first known attempt to develop a statewide context, including all branches and chronological eras;
- In terms of general historic preservation planning, it is the first attempt in California to craft a comprehensive historic context for a thematic area as broad as the history of the military.

The experiment, however, is only worthwhile if the result is useful. The basic test of usefulness is: does the context help the military do better work in the inventory and evaluation of buildings and structures? Better work, of course, requires definition. Perhaps the best definition is cost-

Base, California," June 1997; Tri-Services Cultural Resources Research Center "Cold War Properties Evaluation – Phase III, Inventory and Evaluation of Atlas, Titan, Bomarc and Blue Scout Junior Launch Facilities at Vandenberg Air Force Base, California," October 1997; Geo-Marine, Inc. "Travis Air Force Base, Fairfield, California: Inventory of Cold War Properties," October 1996. Report Number 7, United States Air Force Air Mobility Command Cold War Series.

²⁰ See especially: Williamson & Watt, Architects, "The Architectural Significance of Buildings at Naval Air Station, North Island, San Diego, California," 1988; JRP Historical Consulting Services, "Summary Report on Historical Significance and Historic Preservation Management for the March Field Historic District," 1992; and National Park Service, "Presidio of San Francisco National Historic Landmark District," 1993.

effectiveness: does the context help the military meet its obligations under the National Historic Preservation Act in both an effective and economical fashion?

This section describes how this context can be used to evaluate the significance of military buildings and structures in California.²¹ As stated previously, the task of evaluating historic significance inescapably involves the exercise of judgment. No matter how thorough and well-crafted, an historic context cannot eliminate the need for professional judgment in recommending whether one property should be listed in the National Register, while another should not.

An historic context, however, can help ensure the professional judgments made are based upon facts and in proper historic perspective. As stated earlier and throughout this report, there are three overarching considerations that help define the significance of a military building or structure: strength of association, rarity, and integrity. These three considerations are related to the National Register eligibility criteria. Strength of association is simply a way of emphasizing the need for strong associations with events (Criterion A), persons (Criterion B), achievements in architecture or engineering (Criterion C). Rarity is one way of measuring the importance of a property as an example of its property type. Integrity is derived directly from the National Register requirement that a property retain integrity of design, materials, workmanship, setting, location, feeling, and association. Strength of association, rarity, and integrity can all affect the potential for the property to yield information important in prehistory or history (Criterion D).

A context helps in assessing each of these considerations. It provides a database of existing information regarding historic themes and property types, including known examples of these property types. It offers perspective as to how these property types should be evaluated, recognizing other known examples, the importance of the historic theme, and the importance of the property type within that theme (strength of association). The context will never present a “cookbook,” providing exact recipes for property evaluation. It does, however, provide useful data and, more importantly, useful perspectives on how individual properties might be inventoried and evaluated.

The sections below suggest methods for using this volume to evaluate strength of association, rarity, and integrity. To assess any of these characteristics of an historic property, one must

²¹ Although no attempt was made to develop this historic context beyond California, it is reasonable to conclude many elements of this historic context will be pertinent to military properties elsewhere, as well. California military bases were distinctive in many respects, but were assuredly tied to broad national and international trends. Events of national importance – the development of ICBMs, the SAGE early warning systems, and the testing of the atomic bomb – are inherently national in scope. It is likely many elements of this context can be used to evaluate military buildings and structures throughout the United States.

identify the chronological era, historic theme, and property type of the property in question, and then find the pertinent section of the volume by referring to the table of contents.

1.4.1 Using this Volume to Evaluate Strength of Association

“Strength of association” is an inherently comparative measurement. Saying one property is “strongly associated” with an historic theme implies it is more strongly associated than other properties. To raise the issue of strength of association is to invite the question: strong compared to what?

This historic context can be used to ensure the “strength of association” test is applied in a broader perspective and recognizes the inherently comparative nature of this test. To use the context to evaluate a given building or structure, one must first identify chronological era, historic theme, and property type for the subject building or structure. This information will guide the reader to the appropriate chapter and sections within this report. The information in the report may then be used to determine the strength of association of a given building or structure with the historic theme and property type.

Several examples from this context may be used to illustrate this test for strength of association: the 1918 hangars at Rockwell Field, Naval Air Station (NAS) North Island; experimental aircraft hangars at Edwards AFB; a concrete building from a prisoner-of-war (POW) camp (hypothetical example); and a group of magazines from World War II at Marine Corps Air Station (MCAS) El Toro. These examples will also be assessed for rarity and integrity. The National Register eligibility of these four examples is not very obvious, making them more useful for understanding how this volume can be used to evaluate military properties in California. It would have been possible to use examples, such as the 19th century buildings from the dockside of Mare Island or the early storehouses at the Benicia Arsenal, that are so obviously rare and intact that they instinctively appear to meet the criteria for listing in the National Register. However, this would have been less instructive to the user of this volume.

Example 1: 1918 Hangars at Rockwell Field, Naval Air Station (NAS) North Island

There exist at NAS North Island three “permanent” aircraft hangars, built as part of the early construction at Rockwell Field. Rockwell was the first permanent airfield for the Army Air Corps; it was joined by two temporary fields at what would later become Mather AFB and March AFB. To assess strength of association for these hangars, it is necessary to identify chronological era, theme, and property type. The era is easily identified: it is the Modernization Era, 1902-1918 (Section 5.0). The theme is the adoption of the aircraft by the Army (Section 5.1). The property type is an Army Air Corps hangar (Section 5.1.1).

The question of strength of association refers more to theme than property type; the hangar, of course, is an example of the property type. The question of significance hinges, in part, on whether the hangar is strongly associated with the theme of the Army adoption of the aircraft as an instrument of war.

The historic context addresses the tremendous importance of North Island as one of the oldest military airfields in the United States; Congress has recognized the base as the “birthplace of military aviation.” Rockwell Field has very strong associations with the birth of the Army’s aviation program. It seems clear the buildings are strongly associated with this theme. Using National Register criteria, they would qualify under Criterion A (association with events). They would also likely qualify under Criterion C (significance in design). These hangars were designed by noted architect, Albert Kahn, lending even more weight to eligibility under Criterion C.

Example 2: Experimental Aircraft Hangar, Edwards AFB

In 1942, the Army Air Forces built a temporary test facility, called the Muroc Flight Test Base on the edge of Rogers Dry Lake at modern Edwards AFB. It was initially used to test the Bell XP-59A, *Airacomet*, an experimental jet-propelled aircraft. The project was so secret the Army ordered a phony propeller attached to the plane when it was on the ground, to disguise it as a conventional aircraft. The Army ordered a “Unicon portable-type” hangar, principally to hide the secret plane when it was on the ground. The building still exists as Building 4305 at Edwards AFB. This building may be evaluated within the context of both World War II (Chapter 7) and the Cold War (Chapter 8), since it was built and used during World War II and was an important part of the Cold War experimental aircraft test program. The respective World War II and Cold War themes for evaluating this property, therefore, are emerging weapons and aircraft (Section 7.6) and weapons and aircraft testing and evaluation (T&E) (Section 8.2). The respective specific property types are remote weapons and aircraft test stations (Section 7.6.1) and facilities for T&E of experimental aircraft (Section 8.2.8).

The Unicon portable hangar exemplifies the strength of direct, as opposed to general, associations. Nearly every World War II-era building at Edwards AFB may be linked in some manner to the experimental jet aircraft tests. This particular hangar, although a humble-looking structure is directly, closely, and strongly associated with the XP-59A test program. The context helps establish a perspective through which we may appreciate the importance of this program, not so much to World War II (the plane was never used), but to the Cold War test program. Air Force pilots and scientists were so close to developing a jet aircraft during the war that the sound barrier was broken just three years after the war. Building 4305 also appears to meet the

National Register criteria, based upon its strong association as an important element of the Cold War-era testing program for experimental aircraft (Criterion A, association with events, and Criterion G, exceptional significance for properties less than 50 years old).

Example 3: Concrete Building from Prisoner-of-War (POW) Camp (Hypothetical)

This is a hypothetical example, but plausible, based upon what is known about POW camps. Suppose a base planner discovers the existence of a concrete jail used during World War II to house the more troublesome inmates of a larger POW camp. Further suppose all other buildings from the POW camp have been moved or destroyed; only the concrete jail remains in place. To assess strength of association, one must identify the chronological era (World War II; Section 7.0), the theme (POW camps; Section 7.8), and property type (POW camps or military bases; Section 7.8.1).

This example illustrates a secondary judgment to be made, which concerns the importance of the theme itself. It is known California was host to thousands of POWs during and immediately following World War II, with most apparently being from Italy and Germany. Surprisingly, this is a poorly understood theme. The context notes there were POW camps throughout the state, on Army and Navy bases alike. To date, however, no building has been found to qualify for the National Register on the basis of its association with this theme.

An evaluator is sometimes required to exercise judgment about the importance of the theme itself. It could be argued this theme is not of equal importance to maintenance of military hospitals or training Army Air Corps pilots during World War II. Nonetheless, it is a theme that was unique to the World War II Era in California and that had some effect on the operations of the military and some minor impact on the outcome of the war. While not a major World War II-era theme, it is a noteworthy theme.

A concrete jail building would appear to be directly and strongly associated with this theme. One can imagine many buildings only tangentially associated with the theme. It appears, for example, POWs were hired out to pick fruit and other produce on a seasonal basis. There may be farm labor camp buildings tangentially associated with this theme. A camp building, especially a permanent detention facility, however, would appear to be directly and strongly associated with this theme.

The National Register eligibility for this building may hinge on additional research. Preliminary indications suggest the hypothetical building is important for its strength of association with this theme. That conclusion, however, is only tentative, recognizing the gaps in our understanding of this theme.

Example 4. World War II Magazines, MCAS El Toro.

There exists at MCAS El Toro a group of ordnance magazines built during World War II. Nearly a dozen such magazines exist in two areas of the base, both far removed from the Main Site, which includes barracks, officers' quarters, and other heavily-populated areas. The era for these properties is World War II (Section 7.0). The theme is aviation training (Section 7.2), the basic function of MCAS El Toro. The property type is an MCAS (Section 7.2.5).

Although it does not offer specific guidance for these magazines, the context helps put the whole issue of aviation training and magazine construction into perspective. Aviation training was probably the second most common task on California military bases during the war, second only to the training of Army infantrymen. There were dozens of Army Air Forces, Navy, and Marine Corps air facilities scattered throughout almost every region of California.

The common nature of aviation training illustrates the need to form a distinction between general and direct association. Every air training facility was in some manner associated with the establishment of United States air superiority during the war, which helped turn the tide of the war effort. General associations, however, can lead to trivial conclusions. If we base decisions only on general associations, all of the aviation training bases are eligible.

A more useful question for the magazines relates to the directness of association with some specific aspect of United States air superiority. The context is useful in demonstrating two facts. First, as noted, there were dozens of aviation training bases in California during the war, although only a handful were Marine air facilities. Second, the context demonstrates aviation training bases were fitted with a multiplicity of property types, including barracks, hangars, control towers, beacons, and engine test cells. One such property type is a magazine, a place in which energetic material can be stored safely on a temporary basis.

The question to be asked of these magazines is: were the magazines directly and strongly associated with events significant in the context of aviation training in California or, more specifically, in the training of pilots by the Marine Corps? The question should be asked because it is possible the magazines were used in some extraordinary types of tests, such as tests associated with the Manhattan Project. In most instances, however, these magazines would have been used in storing material used in routine training exercises. Although the Marine Corps made important contributions to the World War II effort, it does not appear these magazines were strongly associated with that theme. The context suggests these magazines do not meet the criteria for listing in the National Register for the strength of their association with this theme.

1.4.2 Using this Volume to Evaluate Rarity

Rarity, like strength of association, is an inherently comparative test. People may disagree as to the exact number that might constitute rarity. How many buildings should exist for an example to be considered rare? Whether it means 5 or 10 or 20, use of the term implies a small number of examples. Rarity is more objective and comparative in its application than strength of association because it implies a quantitative test.

This volume can help determine rarity in two ways. First, the discussion of each property type lists many, but not necessarily all, known examples of a given property type and offers comments on the rarity of the property type. Second, this volume can help to avoid specious definitions of property types. Any property can be said to be “rare,” provided the definition of a property type is tightly drawn. The context can help avoid the mistake of making fine distinctions, not supported by the facts, between property types.

The same four examples that illustrated how this context can be used to evaluate strength of association are used below to illustrate how this context can be used to assess rarity.

Example 1: 1918 Hangars at Rockwell Field, NAS North Island

The three Air Corps hangars at Rockwell Field are the only permanent World War I-era hangars in California. Although it is not demonstrated in the context, it is quite likely these are part of a very small group of such hangars anywhere in the United States. However one defines rarity, the old Rockwell Field hangars – the last examples in California – surely meet the definition.

Example 2: Experimental Aircraft Hangar, Edwards AFB

The first experimental aircraft hangar at Muroc (Edwards AFB) was, as noted, a Unicon portable hangar. This was apparently a theater-of-war hangar, designed for easy assembly by unskilled personnel, and for portability. The time, as noted, is World War II, the theme is testing sites for emerging weapons and aircraft, the property type is remote weapon and aircraft test stations.

The World War II chapter in this volume emphasizes the need to evaluate World War II buildings on the basis of events, rather than architecture or engineering. No property better illustrates this point than the Unicon Portable Hangar. It is not known how many of these hangars still exist. The measure of rarity for this building, however, is not measured in the context of the Unicon hangar, but in terms of the experimental test program. The old Muroc Flight Test Base includes three hangars from World War II – Building 4305 and two additional standard design hangars (Buildings 4401 and 4402), both of a HANG-N-A standards type.

The Muroc Flight Test Base was the only experimental flight test base in California during World War II and no others were quite like it in the nation. In this context, Building 4305 is one of three properties of its type, a figure that surely qualifies as a rare example. As it was the first, it can be said to be unique, the only example of its type.

Example 3: Concrete Building from POW Camp (Hypothetical)

This example shows how the context can be used to frame research questions, even when it does not offer simple answers. POW camps have not been inventoried and evaluated on a comprehensive basis, making it difficult to draw conclusions about rarity. According to this volume, however, POW camp buildings appear to have been built to very temporary “theater-of-war” standards and most probably were destroyed after the war. The question of rarity is not answered by this volume, but the volume offers enough information to suggest it is worth exploring whether or not the building in question is a rare example. The fact it was built of concrete explains its longevity. The possibility exists that the building is a rare – perhaps even the only – example of its type in the state. The context lists a number of military bases that had POW camps, bases that could be consulted to see if any buildings remain. In this instance, this volume does not offer conclusive results, but does put the POW camp into perspective and suggests the questions that need to be answered to assess rarity.

Example 4: World War II Magazines, MCAS El Toro

The context offers several perspectives regarding the potential rarity of these magazines. If they are treated as elements of World War II-era aviation training bases, the magazines are far from rare. Similarly, if they are treated as World War II-era magazines, they are far from rare. Even if they are regarded as World War II-era magazines in Orange County, an unnecessarily fine definition of the property type, they are far from rare, owing to the existence of hundreds of magazines at Naval Weapons Station (NWS) Seal Beach. The properties may be seen as rare only if one applies unnecessarily fine distinctions in defining the property type – World War II-era magazines at an MCAS, World War II-era magazines at an MCAS in Orange County, or World War II-era magazines at MCAS El Toro.

These magazines illustrate an earlier point: any property can be said to be “rare,” providing the definition of a property type is tightly drawn. The context can help avoid the mistake of making overly fine distinctions between property types.

1.4.3 Using this Volume to Evaluate Integrity

Integrity, while it requires some judgment, is a more objective measure than strength of association or rarity. In assessing integrity, one is essentially comparing the appearance of a

property in two time frames: its appearance when it achieved significance and its present appearance. Seven measures are used: location, setting, design, materials, workmanship, feeling, and association. In theory, applying these measures to a property is a straightforward comparison between appearances, then and now.

This volume is more useful in assessing strength of association and rarity than integrity. This is because integrity is measured on the basis of architectural or engineering details, which must be applied to the specific building and requires detailed data about the original appearance gathered from original plans, old photographs, or knowledge of similar property types. The volume does, however, help in making a final judgement about National Register eligibility that involves balancing integrity against rarity. Rarity is recognized in Federal guidelines as a consideration in weighing the impact of modifications over time. In National Register Bulletin 15, *How to Apply the National Register Criteria*, this issue is raised as follows:

Comparative information is particularly important to consider when evaluating the integrity of a property that is a rare surviving example of its type. The property must have the essential physical features that enable it to convey its historic character or information. The rarity and poor condition, however, of other examples of the type may justify accepting a greater degree of alteration or fewer features, providing that enough of the property survives for it to be a significant resource.²²

The volume is also useful in establishing what are sometimes called the “character-defining elements” of a property type. With many civilian buildings, these character-defining elements are architectural – the gable returns of a Greek Revival building, the slanted bay of a Queen Anne, etc. These qualities apply to many military properties, too. For many military properties, however, character-defining elements may be identified only through a solid understanding of how the properties operated. What are the character-defining elements, for example, of a high-speed test track, a special weapons depot, or a Titan II silo? Preservation planners acknowledge that all older buildings and structures have been modified to one extent or another. Assessing integrity focuses on identifying the retention of character-defining elements. To the degree that this volume is useful in identifying the character-defining elements that make a property significant, it can also help to some degree in assessing integrity.

The same four examples that illustrated how this volume may be used to evaluate strength of association and rarity are used below to illustrate how integrity may be assessed.

²² Keeper of the National Register, “Bulletin 15: Guidelines for Applying the National Register Criteria for Evaluation,” 1982, 47.

Example 1: 1918 Hangars at Rockwell Field, NAS North Island

The three permanent hangars from Rockwell Field have not been used as hangars for many years. They are now used for incidental storage, not to service aircraft. Each hangar has been modified to some degree and the modifications differ from one building to the next. In some instances, the hangar doors have been removed and the opening infilled with solid wall construction.

The NPS guidance cited above (National Register Bulletin 15) suggests various conditions that must be met to “justify accepting a greater degree of alteration.” First, the property must be shown to be a “rare surviving example of its type.” Second, the property must “have the essential physical features that enable it to convey its historic character.” As noted above, this volume is particularly useful in judging the first condition (rarity). The second condition (integrity) must be judged on the basis of a close inspection of the appearance of the building as originally constructed. It appears the old hangars at Rockwell Field, while extensively modified, retain the essential characteristics that define them as early hangar buildings.

Example 2: Experimental Aircraft Hangar, Edwards AFB

No site visit was made to Building 4305 in preparation for this report. As noted, integrity assessment requires a highly specific judgment, based upon the design of the subject building or structure. In the absence of that level of detail, it is difficult to judge integrity for Building 4305. However, this volume does raise one issue that appears to be pertinent in assessing integrity for this building: the balancing of integrity and rarity. Judging from historic and modern photographs, Building 4305 has been modified to some degree from its earliest appearance. When testing began, it was an open-walled building, covered with canvas to ensure secrecy. The wall openings have subsequently been infilled. In other respects, the building appears to be unmodified. The historic context suggests this building is sufficiently rare as to warrant some leeway in balancing its rarity against relatively minor modifications. The guidelines for balancing rarity and integrity, discussed earlier, should be applied to this building, as well.

Example 3: Concrete Building from POW Camp (Hypothetical)

It may be presumed that, as a reinforced concrete building, the hypothetical POW jail retains a high degree of integrity. In this instance, this volume offers little information that would be useful in assessing integrity for this property type, simply because so few POW buildings have been inventoried or evaluated. Integrity must be measured by conventional means, comparing historic appearance and current appearance. Since so few POW buildings have been inventoried, the context offers little guidance as to the historic appearance of this property type.

Example 4: World War II Magazines, MCAS El Toro

This volume may be useful in assessing integrity for these World War II-era magazines, by pointing the reader to other bases in which magazines have been inventoried and evaluated. These other studies will document the different designs of Navy and Marine Corps magazines used during the war. This comparative data, however, cannot substitute for comparing the magazines against their historical appearance. A site-specific comparison must be made in every instance. It is likely World War II-era magazines retain a good degree of integrity simply because they were so sturdily built during the war, owing to the nature of their function, and due to the fact there was little need to modernize the buildings because the function has not materially changed.

1.4.4 Using this Volume to Evaluate “Exceptional Significance” for Cold War Properties

Cold War-era buildings and structures represent a special case in evaluating military properties because nearly all are less than 50 years old. National Register criteria specifically exclude listing of properties that have achieved significance within the last 50 years, unless they can be shown to be exceptionally significant. The term “exceptionally” is inherently comparative. It implies the question: exceptional in comparison to what?

Useful in assessing conventional significance, this volume is equally useful in assessing exceptional significance because it provides a database of information relative to rarity, strength of association, and integrity. In addressing the Cold War, a fourth consideration—age—may be used as well. National Register guidelines recognize a common sense distinction between properties that are nearly 50 years old and those much less than 50 years old, holding properties that have achieved significance in very recent years to a higher degree of exceptionality.

Professional judgement is still required, however, to weigh the relative significance of different examples of the same property type. In addressing high-technology properties, which comprise such a large part of Cold War-era properties in California, judgement must be exercised in balancing pioneering technologies against highly successful technologies. The early examples of any given technology were usually plagued with operational problems. This was a predictable pattern, as the military sought to work through problems that had never been previously addressed. Later examples of the same technology generally worked more effectively, but lack association with breakthrough technologies. Modern cruise missiles, for example, are far more effective than the early Regulus missiles tested by the Navy in the mid-1950s. Although generally a failure, the Regulus missile work helped pave the way for the Tomahawk and later successes. Similarly, the Semi-Automatic Ground Environment (SAGE) radar and command

system was primitive by comparison with today's Perimeter Acquisition Vehicle Entry Phased Array Warning System (PAVE PAWS). The SAGE system did, however, work through many of the computer problems that made PAVE PAWS possible. In assessing exceptional significance, the pioneering work must be balanced against operational viability. Both considerations must be taken into account. This volume is useful in this regard because it offers information about how the various technologies evolved, and identifies known examples from different generations of work.

The final decision as to National Register eligibility must take into account a wide array of considerations. For this reason, this context cannot serve as a "cookbook," with simple conclusions. This context does, however, help to frame the questions that must be asked and answered before National Register eligibility can be determined.

One consideration that keeps this context from being a true "cookbook" is the likelihood additional research will be needed to evaluate the significance of a property. This historic context, although it is highly detailed, necessarily summarizes the details of the many and diverse aspects of the history of the military in California. It is also constrained by the state of research for many aspects of that history. The hundreds of cultural resource inventories at California military bases have added immeasurably to our understanding of that history. Nonetheless, there are numerous important elements of that history that have not been documented thoroughly, through cultural resource inventories or through academic history or the history programs of the various military branches.

It is anticipated additional research will sometimes be required in evaluating National Register eligibility for a particular property. This historic context identifies areas in which the research needs are most apparent. Other areas requiring additional research may be identified in the context of future National Register evaluations. The need for additional research should be regarded as an opportunity for the military to document its own history. It should be viewed as an asset, not a liability. The many cultural resource inventory documents prepared by and for the military have collectively created an immensely important archive for students of military history. They have also helped to identify the most important physical aspects of the military's legacy in California. To this extent, these inventories have met and exceeded the expectations of Congress when it passed the NHPA in 1966. New research can only augment the already impressive accomplishments of the historic preservation programs of the various military branches in California.

2.0 COLONIAL-ERA PROPERTIES, 1769-1846

This is by far the longest period treated in this context, nearly 60 years, and the only era that concerns a military other than that of the United States. The period begins with the first Spanish presence in California in 1769, and ends with the United States seizing control of California at the end of the Mexican War in 1846. The period is called the Colonial Era because the military functioned chiefly as an agent of the colonization program, first of the Spanish and, after 1821, of the Mexican government. The Spanish developed a formal program for colonizing their frontier regions, relying upon three institutions: the mission, the presidio, and the pueblo.

The Colonial Era of California history includes a strong military component, specifically the garrisoning of troops by the Spanish and Mexicans to promote national defense and civil order. The Spanish military presence was very small in relation to the acreage of the state and the Mexican troop strength was even smaller. As a result, very few military-related buildings or structures were completed and even fewer exist today, owing to the passage of time.

The principal military building of the period was the presidio. The Spanish presidio had two major assignments: to defend against foreign aggression and to maintain internal order. In both respects, the most important property type was a fortress in which troops could be garrisoned and civilians sheltered in time of stress. A secondary property type was the coastal defense battery, which the Spanish built at the more important harbor locations.

The history of this period is treated more thoroughly in Volume II of the *California Historic Military Buildings and Structures Inventory* (Chapter 2.0).

2.1 THEME 1: SPANISH COLONIAL MILITARY GARRISONS

2.1.1 Property Type: Presidios

The term, presidio, referred to a building as well as the general presence of the military in its frontier regions. Four presidios were built in California during the Spanish Era: the presidios of San Diego, Monterey, San Francisco, and Santa Barbara. Additionally, the Sonoma Barracks, which functioned somewhat like a presidio, was built late in the Mexican Era. The Sonoma Barracks was built chiefly to establish a Mexican military presence at the northern frontier of what is now Sonoma County, to defend against the Russian advancement from their settlement at Fort Ross, also in modern Sonoma County.

The four major presidios were not individual buildings, but rectangular complexes of buildings linked by fortress walls. Typically, a presidio would include barracks for its troops as well as other buildings deemed necessary for their physical and spiritual well-being. For example, it almost always included a chapel, as well as private quarters for ranking officers. It also included corrals and stables for horses, guard houses for sentries, kitchens and mess halls, and other essential buildings. A presidio, in short, was an enclosed military base that featured a wide range of functional buildings that are today scattered at various places within a military base. The presidio was fundamentally different from modern bases, however, in that it was a walled fortress built on Medieval models of military architecture. The layout of the Presidio of Santa Barbara is illustrated Figure 1.

None of the presidios are entirely intact. Indeed, no aboveground resources exist at either the San Diego or San Francisco presidios. A remnant of one adobe building, thought to have survived from the Spanish presidio, is encased within the officers' club at the Army's Presidio of San Francisco. Substantial buildings do remain, however, from the Monterey and Santa Barbara presidios. The Sonoma Barracks is also largely intact. None of the buildings or building remnants associated with the presidios are presently under DoD control.

Examples:

- *Presidio of San Francisco*—Listed as a National Historic Landmark (NHL) and as a National Register Historic District. Virtually nothing remains from the Spanish presidio buildings and structures. It is thought that one portion of an adobe building was incorporated into the officers' club building.
- *Presidio of San Diego*—Listed in the National Register as an historic archeological site. This property is also a NHL.
- *Presidio of Monterey*—The Presidio Chapel exists and is still used as a church.
- *Presidio of Santa Barbara*—Listed in the National Register and is a State Historic Park. Two original buildings remain, joined by several reconstructed buildings. These are part of the Presidio de Santa Barbara State Historic Park.
- *Sonoma Barracks*—. This small complex still exists and is operated as part of the Sonoma State Historic Park.

Registration Requirements

The presidios and the Sonoma Barracks have been listed in the National Register, despite the fact that there are few standing structures with the exception of the Presidio of Santa Barbara, Monterey chapel, and the Sonoma Barracks. The fact that the presidios retain little integrity

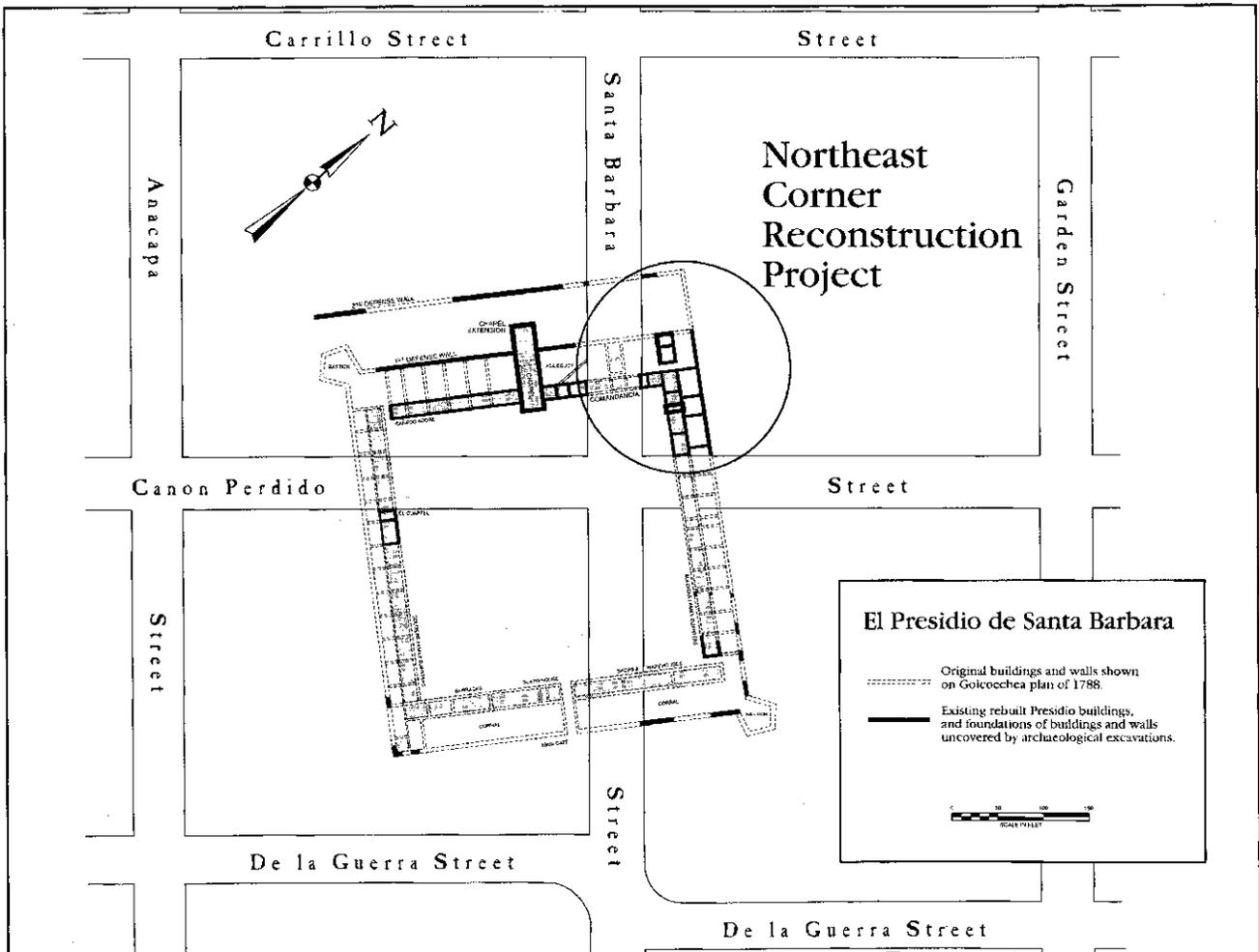


Figure 1. Reconstruction plan for the northeast corner of the Presidio of Santa Barbara. This plan shows the careful combination of archaeology and historical research that has gone into planning for restoration and reconstruction work at the Presidio of Santa Barbara. (Source: Santa Barbara Trust for Historic Preservation.)

bears on their potential National Register eligibility as historic buildings or structures, but not to an extent that it renders them ineligible. National Register guidelines offer some leeway in treating properties that retain little integrity, but are rare examples of a property type. Rarity is recognized in Federal guidelines as a consideration in weighing the impact of modifications over time. In National Register Bulletin 15, *How to Apply the National Register Criteria*, the issue is raised as follows:

Comparative information is particularly important to consider when evaluating the integrity of a property that is a rare surviving example of its type. The property must have the essential physical features that enable it to convey its historic character or information. The rarity and poor condition, however, of other examples of the type may justify accepting a greater degree of alteration or fewer features, providing that enough of the property survives for it to be a significant resource.²³

This same balance of rarity and integrity applies to all Spanish and Mexican resources, whether military or civilian.

The registration requirement for presidios applies little to DoD, simply because DoD controls no standing buildings or structures associated with any of the presidios. It is unlikely that additional intact presidio-related properties will be discovered on DoD lands.

It is possible but unlikely that additional archeological sites will be identified in those presidio components still owned and controlled by DoD. The Presidio of San Diego site is far removed from the many Navy sites in that city. The Presidio of Santa Barbara is many miles from any operating military base. The archeological remains of the Presidio of San Francisco are located on the land of the former Army base of the same name; that post is now the responsibility of NPS. The Presidio of Monterey was located in downtown Monterey, some distance from the Army post of the same name. The modern Presidio of Monterey does include the archeological remains of a coastal defense redoubt and is discussed separately below. There are no military bases in the vicinity of the Sonoma Barracks. In short, as rare and important as the presidios may be, this property type is of little concern to operating military facilities in California.

²³Keeper of the National Register, "Bulletin 15: Guidelines for Applying the National Register Criteria for Evaluation," 1982, 47.

2.1.2 Property Type: Coastal Batteries

In addition to the main presidio compounds, the Spanish built outlying coastal defense fortifications near the Presidios of San Francisco, Monterey and San Diego. These outlying fortifications will be called coastal batteries, although it is an American term and was not used by either the Spanish or Mexican governments.

The properties of all three coastal batteries were transferred to the United States military at the conclusion of the Mexican War and two are still under DoD control. The San Francisco battery site is part of what became the Presidio of San Francisco U.S. Army post. The Monterey site, sometimes called “El Castillo,” (in English, “The Castle”), is on land now used as part of the Presidio of Monterey, or Defense Language Institute (DLI). The San Diego battery, called Fort Guijarros, was on Point Loma. It too fell into disuse after 1821 and was apparently sacked by local residents for building material.

These coastal defense batteries were apparently not well built, at least in comparison to the great stone and brick masonry forts that the United States Army would build shortly after the United States acquired California. Archeological investigations at Fort Guijarros suggest that it was built on a stone foundation, which supported an esplanade on which the cannon was mounted. The esplanade, cannon, and men were protected behind a crenellated wall of stone and adobe, perhaps finished in tile.

Only two sites of these Colonial-era coastal batteries are still controlled by the military on active bases: El Castillo, part of the Presidio of Monterey (Army), and Fort Guijarros, part of the Naval Submarine Base, San Diego (Navy). To the extent that any parts of these batteries still exist, they exist as historic archeological sites, not as standing buildings or structures.

Examples:

- “*El Castillo.*” *Presidio of Monterey (DLI)*—Listed in the National Register.
- *San Francisco Battery*—Listed in the National Register as part of Presidio of San Francisco NHL.
- *Fort Guijarros, Naval Submarine Base, San Diego*—Archeological remnants found to qualify for listing in the National Register. It was located in what became the Army’s Fort Rosecrans, now divided among several Navy facilities at Point Loma. The archeological site is located on the Naval Submarine Base.

Registration Requirements

The Spanish built a limited number of coastal batteries. It is possible, but unlikely, that additional batteries were built, but are absent from the historical record. Any unknown coastal batteries will likely be archeological sites; otherwise, their presence would already have been recorded. If there are additional coastal defense sites, these may be found on DoD lands at the three prime defensive locations — at the entrances to the three major harbors of San Diego, San Francisco, and Monterey. As noted, these will likely be archeological sites and should be evaluated as such. (Inventory and evaluation methods for historic archeological sites are not addressed in this document.)

2.1.3 Property Type: Remnant Presidio Buildings

As noted, none of the four presidios is entirely intact. There are, however, several buildings in Santa Barbara and Monterey that represent remnant elements of the original presidio complexes. Some of these buildings are partial or complete reproductions. The buildings in Santa Barbara and Monterey are under the control of parks departments or private historic preservation groups. Figure 2 shows an artist's rendering of reconstructed buildings at the Presidio of Santa Barbara.

Examples:

- *Royal Presidio Chapel, Monterey*—Listed as a NHL.
- *Remnants of the Presidio of Santa Barbara*—Two original buildings remain, joined by several reconstructed buildings. These are part of the Presidio de Santa Barbara State Historic Park.

Registration Requirements

These buildings best illustrate the appearance of the presidios and should be regarded as very valuable resources. Their value from the standpoint of historic interpretation is incomparable; these are the resources through which this important theme and era in California's military history may be appreciated. However, the registration requirement for remnant presidio buildings applies little to DoD, simply because DoD owns no such buildings or structures. It is unlikely that additional property types will be discovered on DoD lands. In short, as rare and important as the presidios may be, this property type is of little concern to operating military facilities in California.

2.2 THEME 2: NON-MILITARY SPANISH OR MEXICAN RESOURCES

2.2.1 Property Type: Adobe Homes from the Colonial Era

In a few instances, military installations include buildings and structures that were built during the Spanish and Mexican eras, but for non-military purposes. Interestingly, the military acquired

all of these buildings during World War II, when the United States government purchased a series of remnant Mexican-era ranchos, essentially the only expansive tracts of land that could be acquired to establish large military bases. This theme is treated as a part of the legacy of World War II as well. Figure 3 is a photograph of the Santa Margarita Ranch House at Camp Pendleton.

Examples:

- *Las Flores Adobe, Camp Pendleton*—Listed as a NHL.
- *Santa Margarita Ranch House, Camp Pendleton*—Listed in the National Register.
- *Gil Adobe, Fort Hunter Liggett*—Listed in the National Register.

Registration Requirements

It is conceivable, but unlikely, that previously uninventoried Colonial-era adobe homes remain standing on DoD land. It is much more probable that remnants, whether ruins or archeological sites, will be identified. The probabilities of these discoveries are greatest for the large coastal bases, such as Camp Pendleton and Fort Hunter Liggett, simply because the Spanish and Mexican population was overwhelmingly concentrated in coastal areas. The methods for inventory and evaluation of historic archeological sites are not addressed in this document, which deals only with standing buildings and structures.

Spanish-Mexican adobe homes, while rare, are far more common than are presidios or coastal defense batteries. The State of California has a long history of inventorying and evaluating historic homes of this period. This experience may be brought to bear in evaluating any new adobe homes that may be discovered on DoD lands, or acquired by one of the military branches. These homes have no real association with the military and exist on military lands because of relatively recent land acquisitions. The context used to evaluate many civilian-owned adobe homes may also be used to evaluate military-owned adobe homes. These buildings were not military when constructed and are generally well cared-for by the military branches that control them.

2.2.2 Property Type: Non-Military Ruins from the Colonial Era

The Colonial-era homes, such as the Santa Margarita Ranch House, are rare on military bases in California. More commonly, the buildings and structures from this era exist as ruins or historic archeological sites. Ruins and archeological sites, of course, are much less visible than

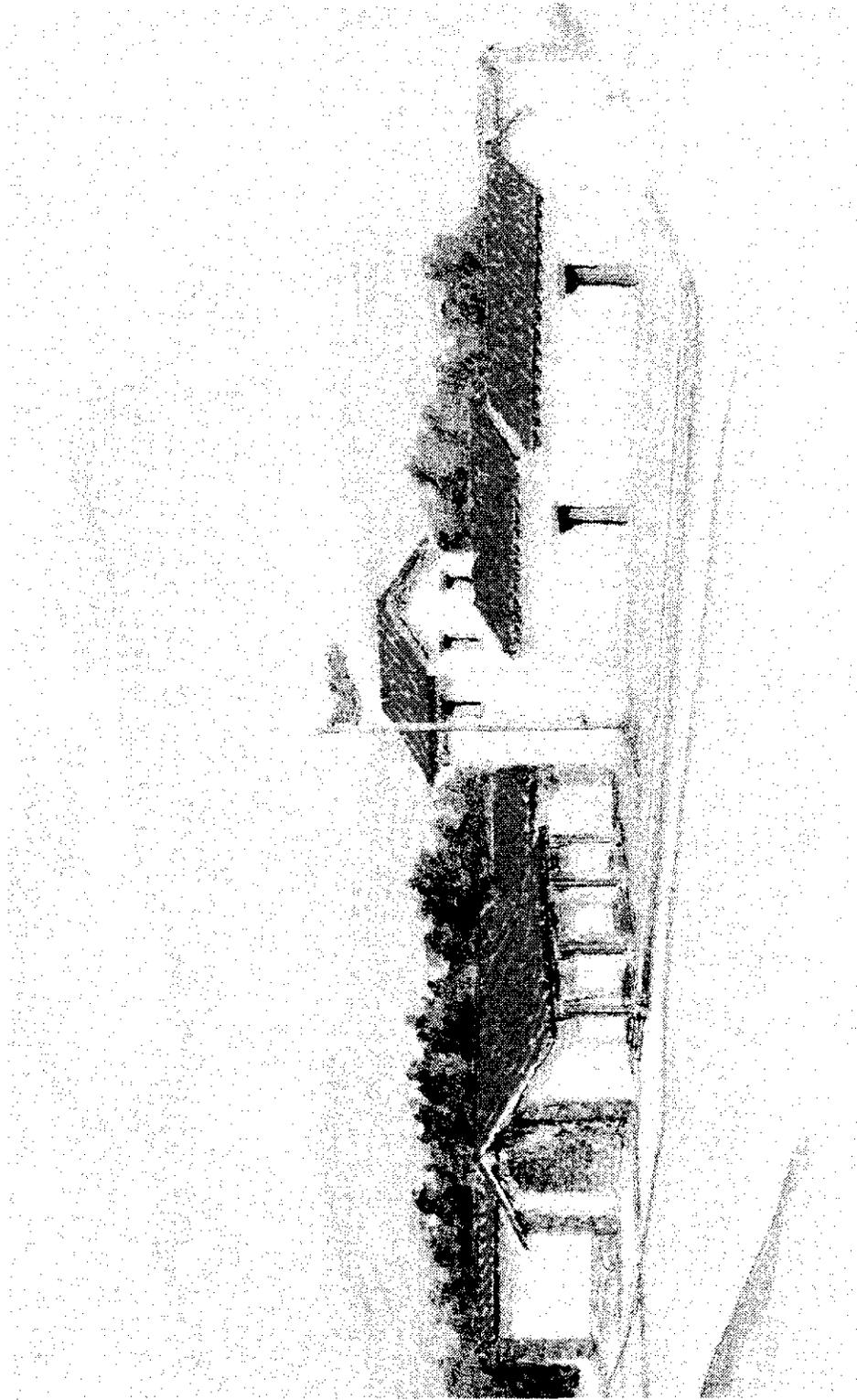


Figure 2. Artist's conception of the reconstructed northeast corner of the Presidio of Santa Barbara. Reconstruction is the final step in the long process through which the Santa Barbara Trust is recreating the Presidio in downtown Santa Barbara. (Source: Santa Barbara Trust for Historic Preservation.)



Figure 3. The long porch, or corredor, at the Santa Margarita Ranch House, Camp Pendleton, home to the commander of Camp Pendleton, is one of the finest and best-preserved Mexican-era adobe homes still standing in California, rivaling any adobe buildings owned by parks departments at the local, state, or national level. (Source: JRP Historical Consulting Services.)

standing structures. These properties have been identified on the large coastal bases like Fort Hunter Liggett and Camp Pendleton. The incidence is highest on the coastal bases, of course, because the Spanish and Mexican settlements were concentrated in the coastal areas. It is unlikely that all of the ruins and historic archeological sites have been identified and evaluated.

Examples:

- *Las Flores Asistencia, Camp Pendleton*—Listed in the National Register.
- *Canal system and other remnants of Mission San Antonio, Fort Hunter Liggett*—Inventoried, some found to qualify for listing in the National Register.

Registration Requirements

Ruins and historic archeological sites are treated as “sites,” under National Register eligibility criteria. Typically, these sites are evaluated under National Register Criterion D, as properties that “have yielded, or may be likely to yield, information important in prehistory or history,” although they may also be eligible under other National Register criteria. The sites should be treated in the manner of the military historic archeological sites from the same period, including the presidio and coastal defense ruins, although they should be evaluated under civilian, rather than military, themes. Because they are not buildings or structures, these sites go beyond the scope of the present volume.

3.0 FRONTIER-ERA PROPERTIES, 1846-1865

This period begins with the victory of the United States over Mexico in the Mexican War, which established the United States' control over California, and ends with the end of the Civil War in the United States. During the early years of the American period in California history, the military (particularly the Army) served as a key defender of social order in the newly acquired territory. Between 1846 and 1850, the Army governed California under military rule, although the officers in charge wisely chose to establish make-shift local governments, based upon both American and Mexican precedents. Even following statehood in 1850, California civil government was weak and ineffective, particularly in dealing with frontier settlements far from San Francisco. The Army was arguably the only effective force for law and order in many regions of California. By the close of this era, the Army was dispatched to various locales in the state, not only to foster domestic order, but also to guard against sabotage or incursion by forces sympathetic to the Confederacy. In short, the military and the Army in particular were called upon to ensure domestic order far more than to protect against threats from foreign nations.

During this period, the majority of United States troops in California were stationed at frontier posts far from the major metropolitan areas. Although they served generally to stabilize settlements in the areas in which they were located, these remote forts were established in most cases to address Indian-white violence. During the Civil War years, a few forts were established as well to suppress potential sabotage from Confederate sympathizers. Because they were built to temporary standards, very few of these frontier Army posts still exist. Miscellaneous buildings and structures may still be found; none are owned by DoD.

Although most troops were stationed at frontier forts, both the Army and Navy began to build permanent facilities during this early period. Three major permanent bases dominated military life in California during this period: the Army's Benicia Arsenal and Presidio of San Francisco and the Navy's Shipyard at Mare Island. These three facilities, all of which have closed, include essentially all of the permanent military buildings that still exist from the Frontier Era.

The Army and Navy were careful in their design of permanent buildings, treating these barracks, shops, stables, and other buildings in the same manner as post offices, custom houses, or other types of permanent Federal buildings. Like other Federal buildings of the era, most permanent military buildings were designed in the Greek Revival style, the architectural vocabulary of Thomas Jefferson and the early Republic and the dominant architectural motif for public buildings in this country in the years before 1866 (end of the Civil War and the Frontier Era).

The history of this period is treated more thoroughly in Volume II of the *California Historic Military Buildings and Structures Inventory* (Chapter 3.0).

3.1 THEME 1: ROLE OF THE MILITARY IN CALIFORNIA BEFORE STATEHOOD

Between 1846 and 1850, the U.S. military was the dominant governmental institution in California. Early in the year 1846, California was a distant outpost of Mexico, nominally governed from Mexico City, but effectively a self-governing territory. The American conquest of California began when Commodore John Sloat sailed into Monterey Bay in July 1846. Mexican California was initially subdued by Navy and Marine Corps personnel, joined by Army Captain John C. Fremont and a ragtag battalion of mountain men and American-born settlers in California. In time, they would be joined by Army troops under General Stephen Kearney, who had marched overland from Santa Fe. Mexicans in southern California put up fierce resistance and the territory was not controlled completely by American troops until January 1847.

For three years, between 1847 and 1850, California was under martial law, with the ranking officer (always an Army general) in command. The Army was in control during the transition from Mexican to American rule in 1847 and 1848. It was also in control during the early years of the Gold Rush in 1848, 1849, and part of 1850. Martial law was not a role that the Army requested or sought to prolong. Military leaders worked closely with civilians to facilitate a transfer of power from martial law to civil law. This was accomplished with the constitutional convention, which met in Monterey in 1849, and the admission of California as a state on September 9, 1850. There are only a few buildings and structures that reflect any part of the American military's role in California before statehood.

3.1.1 Property Type: Mexican War Battlefields

There were no formal nation-to-nation battles in California during the Mexican War, owing to the fact that there was essentially no Mexican Army stationed there. There were substantial engagements, however, between American forces and bands of *Californios*, mostly in southern California, where resistance to American rule was greatest and best organized.

The best-known confrontation of the war was the Battle of San Pasqual in San Diego County, in which the Army's 1st Dragoons, having marched from Santa Fe, New Mexico, were engaged by an ad hoc group of *Californio* lancers in December 1846. Historians still debate who won the battle. The Americans suffered heavier losses, but held the ground. The decisive battle of the war was the Battle of Los Angeles in January 1847, in which Army, Navy, Marine Corps, and

volunteer troops marched from San Diego to Los Angeles and effectively put an end to the resistance by the *Californios*.

Although these battles were highly important to the history of the state and were more extensive than is commonly believed, these were nonetheless minor engagements compared to Civil War battles or major battles in Mexico during the Mexican War.

Examples:

- *San Pasqual Battlefield, San Diego County*—This property is maintained as a State Historic Park.
- *Camp de Cahuenga*—At this site, the Mexican (*Californio*) forces surrendered following the Battle of Los Angeles. Located on Lankershim Boulevard in North Hollywood, the property is a city park.
- *Fort Rosecrans National Cemetery*—The American dead from the Battle of San Pasqual were reburied in this National Cemetery on Point Loma, although the remains were moved twice before final burial at this site. Surrounded by Navy facilities, this cemetery is the responsibility of the Veterans Administration.

Registration Requirements

The Mexican War sites represent the only battlefields in California, other than sites associated with the Indian wars. The battles of San Pasqual and Los Angeles were the only major confrontations during the war, although numerous smaller skirmishes took place throughout northern and southern California. These battlefields are on land that is no longer controlled by DoD. It is conceivable, but unlikely, that other battlefield sites exist on lands controlled by the military in California.

NPS has developed guidelines for the evaluation of battlefields, which are treated as “sites” under the National Register classification system.²⁴ Indeed, the Keeper of the National Register has issued an entire bulletin treating this subject. If any battlefields are discovered, they likely exist as sites without associated buildings and structures, and should be inventoried and evaluated in terms of NPS guidelines for this property type. Because this series does not treat archeological sites and because none of these sites are located on DoD land, no additional registration requirements are offered here.

²⁴Keeper of the National Register, “Bulletin 40: Guidelines for Identifying, Evaluating, and Registering America’s Historic Battlefields,” n.d.

3.1.2 Property Type: Wartime Military Command Centers

During the Mexican War, the American command was often confused. Indeed, the most recognizable figure, Lt. Col. John C. Fremont, was ultimately court-martialed for insubordination, arising, at least in his view, from confusion as to the chain of command in this joint Army-Navy-Marine Corps exercise. During the war, the command center for the Army and Navy moved from town to town, as the military reacted to emergencies. During most of the war, the “headquarters” for the military was at Monterey, in various homes of the area. Commodore Robert Stockton occupied the Casa de Bandini in San Diego as he planned for the march on Los Angeles, setting up the decisive battle of the war in 1846.

Examples:

- *Casa de Bandini, San Diego*—Part of Old Town San Diego State Historic Park.

Registration Requirements

The wartime headquarters for the Army and Navy were used on an occasional basis and moved from place to place, depending upon the circumstances. Additional research may identify other properties that belong in this category. The association between these properties and the war effort will likely be ephemeral, simply because the buildings were used for this purpose for only short periods of time. Some of these buildings may be significant for reasons that go far beyond this theme, as is the case with the Casa de Bandini.

3.1.3 Property Type: Seats of Government During Years of Military Rule

American military governors established a permanent seat of government at El Cuartel, the barracks building at the Mexican Presidio of Monterey, which was not the same location as the modern Army post of the same name, about 1.5 miles to the east. This building was used as the office of the American military governors of California from 1846 to 1850. Unfortunately, this building was demolished around 1910, leaving no tangible reminder of this remarkable period of martial law in California. The government began to shift to civilian control in 1849 and 1850. One key resource associated with this transition that still exists is Colton Hall in Monterey, site of the 1849 Constitutional Convention. The California Legislature first met in San Jose in 1850 in a building that no longer exists. The state capitol would change from city to city before being firmly established in Sacramento in 1854.

Examples:

- *El Cuartel (Mexican Army barracks), Monterey*—Demolished.
- *Colton Hall, Monterey*—Listed in the National Register.
- *First Capitol Building, San Jose*—Demolished.

Registration Requirements

These early seats of government represent the true beginnings of American government in California and are exceedingly valuable in that regard. The only extant property associated with this theme is Colton Hall, commonly regarded as one of the most important historic properties in California. It is owned and maintained as a museum by the City of Monterey. Because this is the only remaining building of this property type and because this building is already listed on the National Register, there is no need to develop registration requirements for this property type.

3.2 THEME 2: ARMY'S ROLE ON THE FRONTIER

During the early years of statehood – 1850 to 1865 – civilian governments in California were scarcely able to control the far-flung settlements of the young state. The population of California was never so scattered as it was during the Gold Rush, when a large proportion of the population resided in remote parts of the state, many of which are wilderness areas today. The Army played a crucial role in maintaining domestic order in California during this period, particularly on the frontier. Dozens of frontier camps were established, first to quell Indian-white violence and later to protect against Confederate troops or sympathizers. Support facilities were also needed to train and supply the troops that would be sent to the frontier districts.

During the Civil War, the Army was asked to expand its mission to include protection against direct attack by Confederate troops, as well as against sabotage by Confederate sympathizers living in California. Thus, during the war, the Army in California was faced with three basic missions. First, it retained its essential mission of ensuring some degree of stability and peace in the frontier regions, a mission that in most cases involved the continued quelling of Indian-white violence. Second, it had to defend against potential Confederate sabotage, a real possibility throughout the United States, although it rarely occurred in California. Third, it needed to consolidate at least one credible fighting force somewhere in the state, to be able to launch an initiative against internal or external threats. The build-up at the Presidio of San Francisco during the Civil War is attributable to this third mission: the 1,000 or so soldiers garrisoned there represented essentially the only credible fighting force in the state during these years.

One strategy pursued by the Army during the Civil War was to assemble a force of volunteers that could relieve some duties of the regular Army, which was stretched thin by its multiple missions. The principal response was the organization of the California Volunteers. The California Volunteers were organized chiefly to deal with the perceived threat of Confederate sabotage, a threat that never materialized to any great extent. The volunteers were trained at the

Drum Barracks near Los Angeles, but saw duty chiefly at remote outposts, such as Camp Independence in Inyo County.²⁵

It should be noted that a large percentage of the Army's assets in California during the Civil War were dedicated to staffing the coastal defense batteries at the entrance to San Francisco Harbor. These are discussed in Section 3.4, below.

3.2.1 Property Type: Frontier Fortifications

Dozens of frontier Army camps were established during this period. The history of each is unique because each was established for a particular purpose. These temporary camps were built in virtually every corner of the state, although the concentration was in the northern half where the bulk of the population was located. Many, indeed, were located in areas that even today have very low population levels. This was true, for example, of Fort Bidwell in the northeastern corner of the state, Camp Independence in Inyo County, Fort Ter-Wer in Del Norte County, and Camp Miller, now under Millerton Lake in Fresno County.

Most of these camps have disappeared without a trace. It appears that virtually none of these camps was located on land now controlled by DoD. The few remaining buildings and structures from these camps are now owned by parks departments, either of the State of California or the various counties and cities. The most intact and interesting example is Fort Tejon, a complex of adobe barracks, quarters, and administrative buildings located near Tejon Pass, in Kern County (see Figure 4). It is owned by the State of California and operated as a State Historic Park.

Examples:

- *Fort Tejon, Kern County*—Operated as a State Historic Park.
- *Fort Humboldt, Eureka*—A single building owned by the State of California.
- *Camp Independence, Inyo County*—No buildings in situ.
- *Old Fort, a small redoubt built by soldiers from Camp Independence*—The ruins of this fort are located on the ranges of present-day NAWS China Lake. These ruins were evaluated by the Navy and were found to meet the criteria for listing in the National Register.

²⁵ The California Volunteers did engage Confederate troops in New Mexico. Other California Volunteer units were attached to the Army of the Potomac and saw hard duty in the East. There are, however, no Civil War battlefields in California.

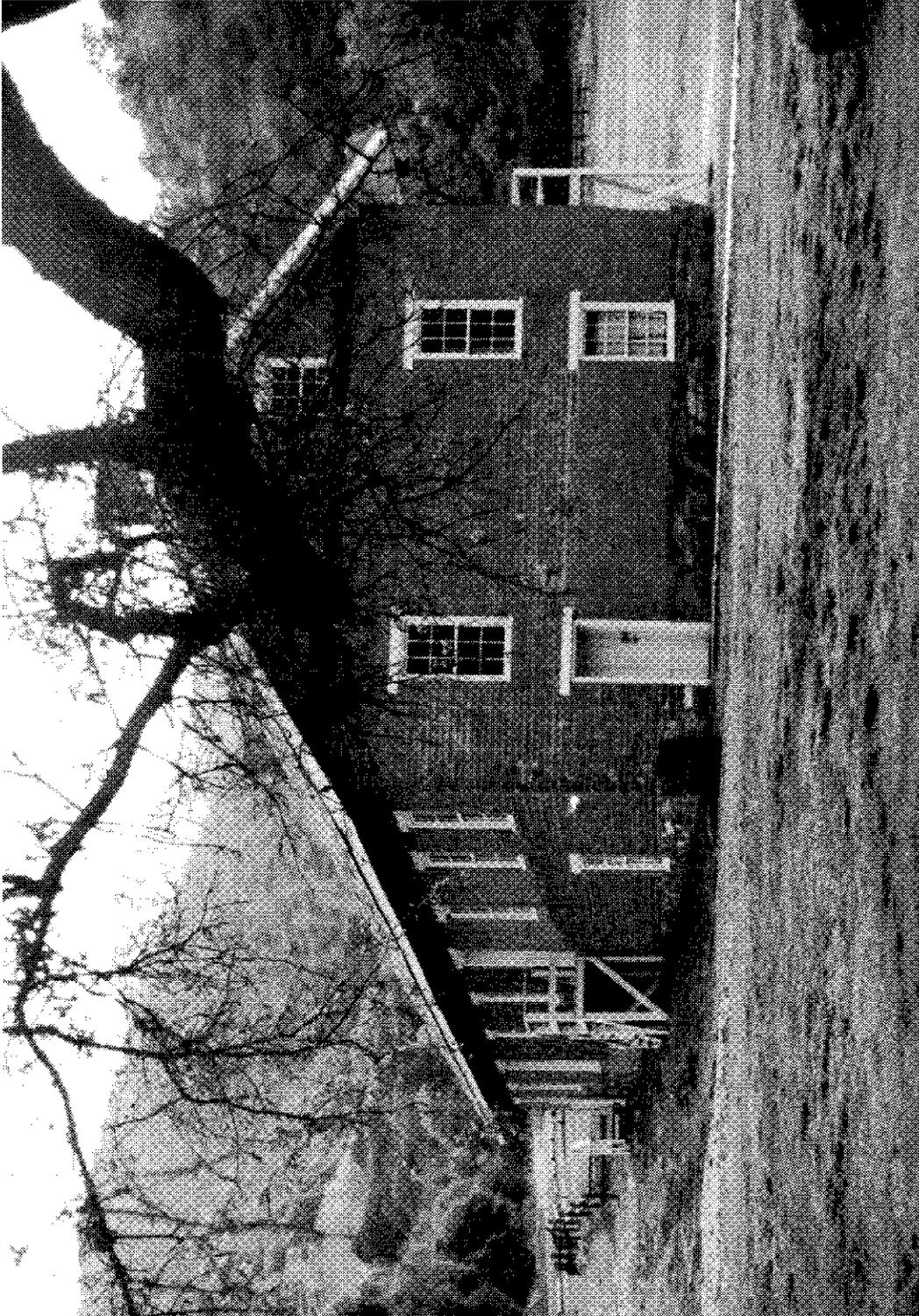


Figure 4. Fort Tejon, built during the 1850s. Fort Tejon included numerous adobe buildings. (Source: California State Department of Parks and Recreation.)

Registration Requirements

None of the longest-lived of the Army forts exist on DoD lands. It is conceivable, however, that some parts of the old frontier Army forts still exist on military installations.

The commanders of these isolated forts sometimes built satellite facilities, away from the main compounds. It is conceivable that some of these small redoubts still exist on land that is now controlled by DoD. The likelihood of finding such a resource is greatest at the large Mojave Desert bases, such as NAWS China Lake, Fort Irwin, or Edwards AFB, or at the larger coastal bases, such as Fort Hunter Liggett or Camp Roberts.

Newly discovered, isolated elements of the Army's frontier forts will likely appear as ruins or archeological sites, rather than as full standing structures. Intact standing structures associated with these isolated forts should be regarded as rare properties with a high potential for National Register eligibility, even with a moderate degree of integrity. The ruins and archeological sites, on the other hand, must meet more demanding significance requirements, owing to their low degree of integrity. The properties may, however, qualify for the National Register as historic archeological sites, a property type that is not addressed in this report. Since this property type is outside the scope of this document, no registration requirements are provided here.

3.2.2 Property Type: Civil War-Era Barracks

Many of the frontier Army forts were built during the Civil War, although only a small number were specifically associated with the theme of suppressing Confederate incursions or sabotage in California. The bulk of these forts were designed to deal with Indian-white conflict. The presence of the Army in these isolated areas, however, undoubtedly contributed to the theme of defense against Confederate sabotage as well. The Civil War-era barracks at these locations are a part of this legacy.

Examples:

- *Drum Barracks, Wilmington, Los Angeles County*—Listed in the National Register.
- *Camp Independence, Inyo County*—A few barracks buildings remain, but not on original sites.
- *Civil War-era barracks, Presidio of San Francisco*—Listed in the National Register.

Registration Requirements

None of the Civil War-era forts are on DoD property. It is possible, but unlikely, that intact examples will be discovered. If examples are identified, they should be inventoried and evaluated in the same general context as all other Frontier-era Army posts.

3.2.3 Quartermaster Storehouses

The deployment of thousands of troops to the inland frontier forts created huge logistical problems for the Army. In the years before completion of the railroad and any semblance of an inland road system, Californians got their supplies chiefly by ship or boat. The Army supplied these inland forts with materials that arrived in San Francisco by ship and were transported as far as possible upstream on the inland waterways. Not surprisingly, the first truly permanent Army post in California was a supply depot located on an easily navigable inland location. Both the Navy and Army coveted portside land at the edge of the small town of Benicia because it was a deep-water location and accessible to the inland areas. The Army began building a supply depot at the site in 1850. The Benicia Arsenal would remain the principal supply and ammunition depot throughout the 19th century and much of the early 20th century.

The Benicia Arsenal stands as the greatest example of a supply depot from this period. Fort Mason, which was taken over by the Army during the Civil War, would ultimately grow into a major Quartermaster Corps supply depot. During this period, however, the fort was used chiefly as barracks and for coastal defense batteries.

The Benicia Arsenal property includes a handful of storehouses that were built in the 1850s and 1860s. The most impressive group includes Buildings 7, 8, and 9 (the “Camel Barns”), which now sit in isolation from the remainder of the old Army post, separated by a freeway and modern industrial uses. Built between 1853 and 1856, these include 2 two-story sandstone storehouses and a small engine room.²⁶ In the quality of the masonry and Greek Revival detailing, these buildings rival the old shops at Mare Island as surviving examples of mid-19th century military industrial design. These buildings are shown in Figure 5.

Examples:

- *Buildings 7, 8, and 9 (“Camel Barns”), Benicia Arsenal*—Built in the mid-1850s. Listed in the National Register.
- *Building 10, Powder Magazine, Benicia Arsenal*—Listed in the National Register.

²⁶ These buildings are commonly called the “Camel Barns,” with reference to the camels of the Camel Corps, which were kept at Benicia Arsenal until they could be auctioned off. It is unlikely that the camels were actually kept in these storehouses.

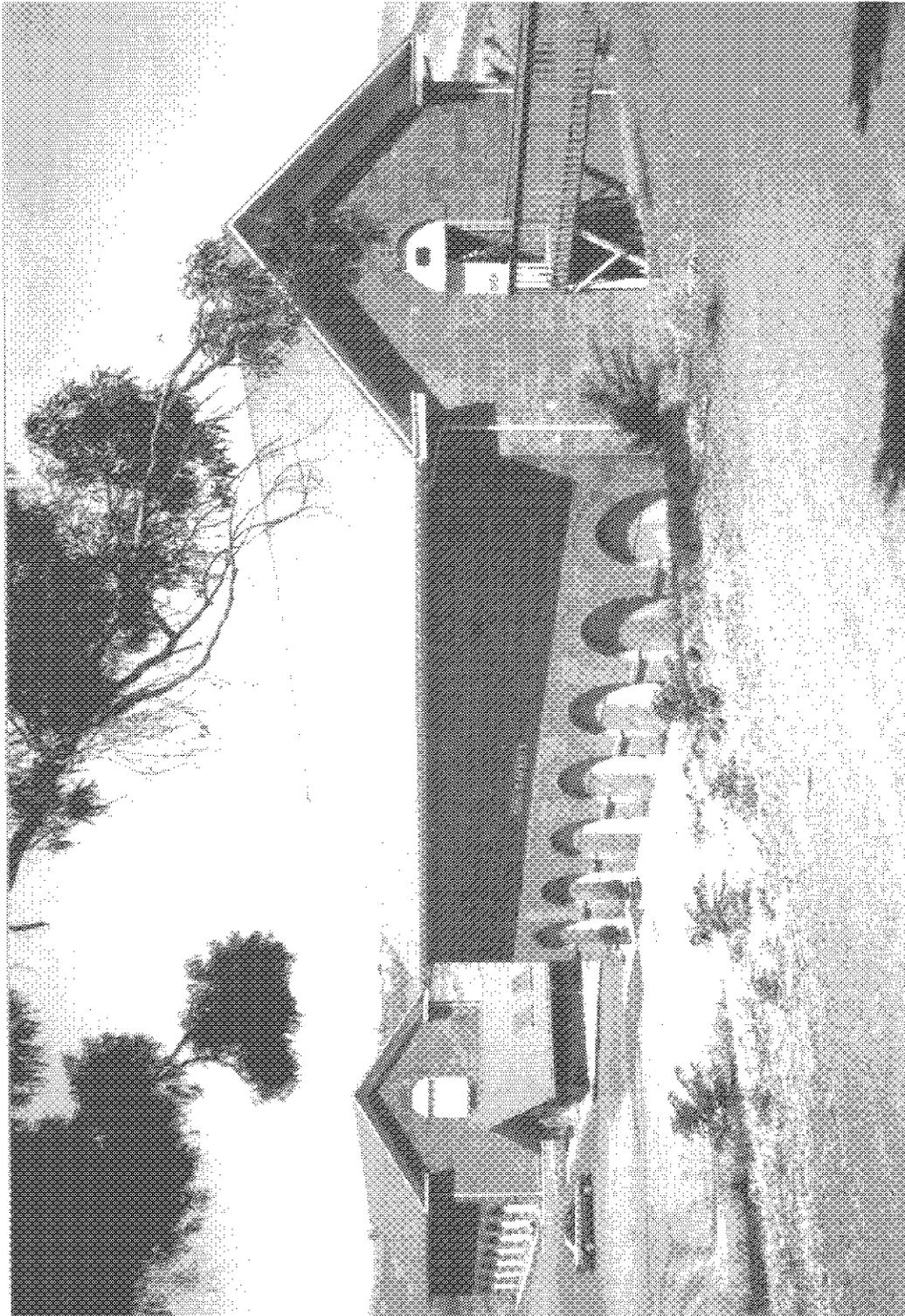


Figure 5. Camel Barns, Benicia Arsenal. The earliest storehouses at the Benicia Arsenal date to the 1850s. (Source: Foster Wheeler Environmental Corporation.)

Registration Requirements

The Benicia Arsenal closed in the mid-1960s. It was reused as an industrial park, associated with a nearby port. The successes and failures of this reuse effort may be instructive for the local and Federal agencies that will take responsibility for other military bases with highly significant historic properties, particularly the two other bases with substantial numbers of buildings and structures from the Frontier Era – Mare Island Naval Shipyard and the Presidio of San Francisco.

The Benicia Arsenal was closed at about the time the NHPA was first enacted. The reuse of this pioneering post occurred while historic preservation tenets and philosophies were still maturing and the lessons learned from reuse of the buildings at this post should be studied in the process of developing strategies for reuse of the few remaining military buildings from the Frontier Era in California. Few would disagree that the buildings at the Benicia Arsenal, Mare Island Naval Shipyard, and Presidio of San Francisco from the 1850s and 1860s qualify for the National Register under current circumstances. The important question is: will they still qualify in the future, as reuse programs are implemented?

3.3 THEME 3: FACILITIES TO REPAIR PACIFIC SQUADRON SHIPS

The Army assumed the greatest burden for the defense of California during the Frontier Era, including rough duty in the frontier forts and the massive job of defending San Francisco Harbor. The Navy's presence in the state also was very substantial, however, as reflected in the construction of the great shipyard at Mare Island. Mare Island, which began operating in 1854, was the first and for many years the only Navy station on the West Coast.

The setting and site plan for Mare Island are indicative of the mid-19th century frontier conditions in California. Ostensibly, the purpose of the facility was to be a naval shipyard, a repair facility for the ships of the Pacific Squadron; these ships had no other place to go on the West Coast. Because it was the lone outpost of the Navy, however, Mare Island had to be fitted with the full complement of facilities associated with a Navy station. It needed an ammunition depot, for example, simply to have a place to store a ship's ordnance while it was being repaired. As it had an ammunition depot, the base needed a detachment of Marines to guard the ordnance. With permanent residents and crews in waiting, it needed to have some of the social services associated with a full station, such as a hospital and a chapel.

Not all of these buildings were constructed before 1866 (during the Frontier Era). The Navy first built the essential structures: the shipyard shops and ammunition magazines. While a few non-

essential buildings were constructed during the early years, the best remaining buildings from the Frontier Era are the shops along the waterfront and the magazines in the ammunition depot.

3.3.1 Property Type: Shipyard Shops

The shipyard at Mare Island was essentially a government-owned and operated industrial operation. Shipyards, munitions factories, and, much later, aircraft repair depots, were rare instances in which the Federal government built government-owned operations that competed directly with the private sector.

Not surprisingly, the oldest buildings at Mare Island are industrial buildings. The waterfront area along the Mare Island Strait includes more than a dozen 19th century brick industrial buildings. Although these superlatives are difficult to prove, it is likely that this collection of shops represents the largest collection of 19th century industrial buildings in California. Building 46, shown in Figure 6, is the oldest remaining example of a shop building at Mare Island. The buildings were well constructed, included usable clear spans, and could be adapted to new naval technologies, as the Mare Island shipyard made the transition from wooden sailing ships to steel, coal-fired, and later oil-fired, ships and nuclear submarines. These old buildings were not retained as museum pieces; they were still in use when the shipyard closed in the mid-1990s.

Examples:

- *Building 46, Mare Island*—Listed as part of the Mare Island Historic District and as part of a NHL, focused on 19th century buildings.
- *Other 19th century shops along the Mare Island waterfront*—Listed as part of the Mare Island Historic District and as part of a NHL, focused on 19th century buildings.

Registration Requirements

There is no other place in California quite like Mare Island and it is highly unlikely that other examples of this property type will be found in the future. The shops along the Mare Island waterfront are arguably the core assets at that facility and can be regarded as highly significant examples of the Navy's long history in California.

In an unusual circumstance, Mare Island is a designated NHL, focused on 19th century buildings, and is a National Register historic district that includes buildings built through World War II. The older shops are included in the historic district and NHL designation.

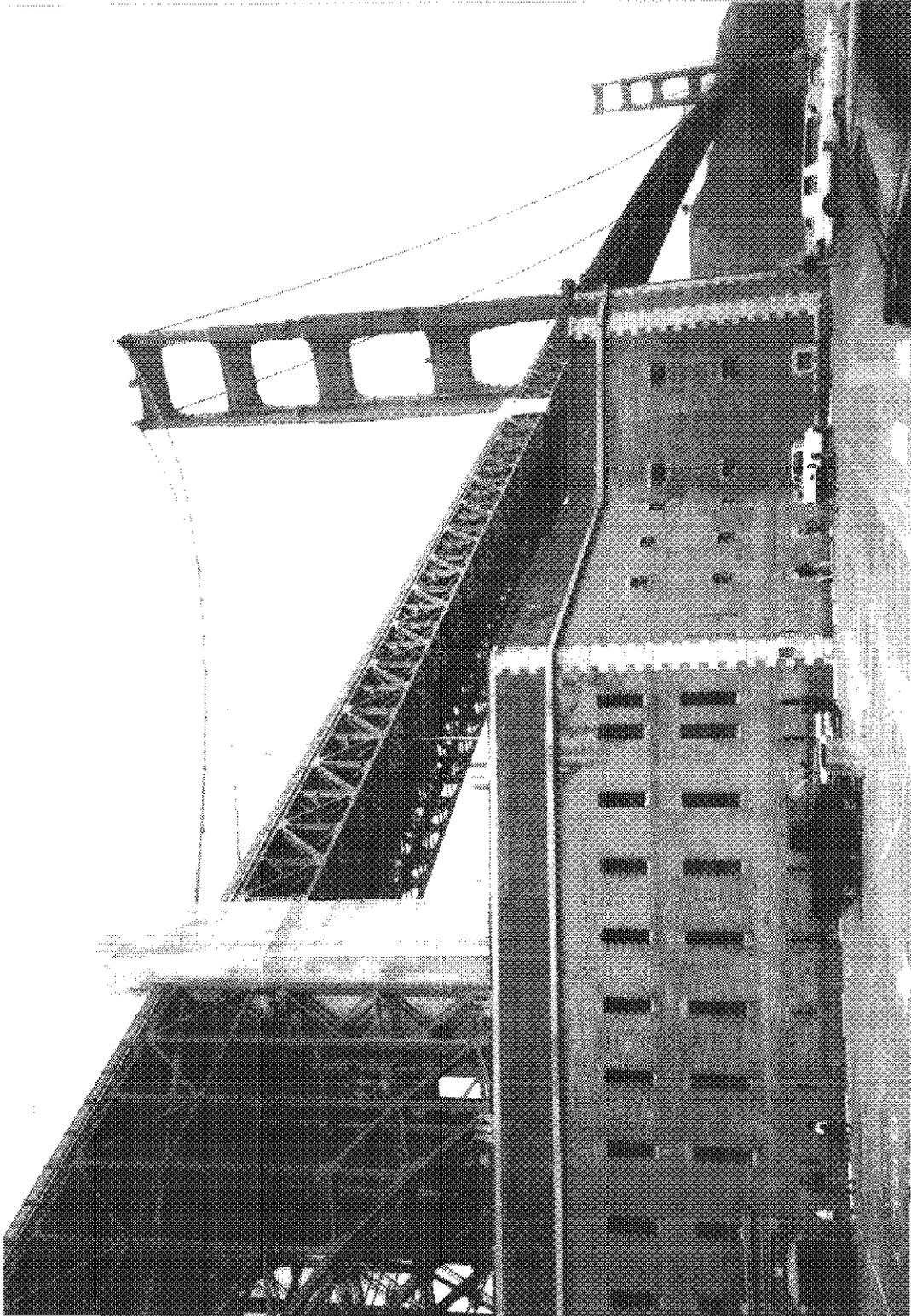


Figure 6. Fort Point at the Presidio of San Francisco. Fort Point is a rare example of a pre-Civil War fortress; rare because so many on the East Coast and in the South were damaged or destroyed during the Civil War. (Source: JRP Historical Consulting Services.)

3.3.2 Property Type: Early Magazines

As noted earlier, Mare Island became a multiple-purpose Navy yard, simply because there was no other Navy facility in the state or anywhere else on the West Coast. The station built an ammunition depot, simply because there was no other place to store a ship's munitions while the vessel was in drydock. The ammunition depot at Mare Island is as old as the shipyard and the oldest buildings there date to the 1850s and 1860s.

Examples:

- *Building A1 at Mare Island*—Listed in the National Register as part of the Mare Island Historic District.

Registration Requirements

The old magazines at Mare Island are the only examples of this property type in California, i.e. the only mid-19th century magazines in the state. The function of a magazine has changed very little over time; it provides temporary storage for energetic material. The design, however, has changed a great deal, in terms of the engineering as well as the architectonics of this building type. As discussed below, the old magazines at Mare Island are excellent examples of Greek Revival design. In that sense, they epitomize the mid-19th century concept of architectural unity in base design. Since the only example of this property type is already listed on the National Register, no registration requirements have been developed.

3.4 THEME 4: FRONTIER-ERA COASTAL DEFENSE

California represents more than half of the United States' Pacific coastline, excluding Alaska. The Gold Rush made San Francisco Bay one of the busiest harbors in the country and the crucial link in the trade network that allowed the California frontier communities to survive. That the harbor also served as the principal shipping point for millions of dollars in gold only added to its importance. Before California was linked to the rest of the United States by rail, the defense of San Francisco Bay was seen as of paramount importance, perhaps the single most important mission of the military in the state.

Not surprisingly, some of the oldest and most important military-related historic properties in California are associated with coastal defense, specifically the defense of San Francisco Bay. The subject of coastal defense recurs throughout all chapters in this volume, from the Spanish-Mexican period through World War II. The thoroughness with which this theme has been analyzed reflects several developments. First, it reflects the importance of the theme itself; a

major part of the Army's budget in California was dedicated to constructing buildings and structures associated with coastal defense.

Second, the attention given to coastal defense appears to reflect more modern trends. After World War II, the various coastal defense batteries were abandoned. Modern coastal defense relies upon a variety of weapons, from guided missiles to aircraft carriers, but not upon the permanently mounted coastal batteries of guns that characterized coastal defense from the Civil War through World War II. As these batteries were abandoned, many were turned over to parks agencies. NPS in particular became the owner of most of the San Francisco Bay Area batteries, as part of its Golden Gate National Recreation Area (GGNRA), and of a few of the batteries in the Point Loma area, near the Cabrillo National Monument.

NPS approached the task of managing these batteries in the scholarly and deliberate manner in which that agency approaches all historic preservation projects. One of the first steps taken by NPS was publication of a massive study, *Historic Resource Study: Seacoast Fortifications*, which serves as a foundation and analytic context for evaluating other coastal batteries. The batteries in San Pedro at the entrance to Los Angeles Harbor, built in the early 20th century, have been studied at length by the Fort MacArthur Museum Association.²⁷ More recently, the Navy has inventoried, evaluated, and listed in the National Register essentially all of the coastal batteries on Point Loma, which the Army chose as its locale for the defense of San Diego Harbor.²⁸ NPS also wrote a context for the Point Loma coastal defense properties, a document that has been used extensively by others.²⁹ Lesser seacoast defense installations have been inventoried and evaluated as well.

For various reasons, then, the general theme of coastal defense has arguably been studied more thoroughly than any other aspect of military history in California. This fact is of importance in several respects. First, most of the key coastal defense properties have already been listed in the National Register. The very high registration rate associated with this theme should be taken into account in the evaluation of the few coastal defense installations that have not yet been inventoried. Second, the history of coastal defense, particularly the abandonment of the batteries after 1945, left many of the most important historic properties in the hands of parks departments, including NPS and the California Department of Parks and Recreation (DPR). Both agencies

²⁷The Fort MacArthur Museum Association maintains a very informative website: www.fmac.org.

²⁸Keniston Architects, "Fort Rosecrans: Point Loma Coastal Defenses. National Register of Historic Places Nomination," May 1996.

²⁹Erwin N. Thompson, "The Guns of San Diego: San Diego Harbor Defenses, 1796-1947," National Park Service, 1991.

have taken great care to manage these resources. Local governments and non-profit associations have also worked to preserve these resources.

The coastal defense installations from the 1850s and 1860s represent a distinct generation of the long history of such construction. Both the Union and Confederate forces were successful in destroying coastal fortifications during the Civil War, forcing the United States to redesign its batteries during the post-war years. Very little remains of the coastal fortifications from this period, apart from the great Fort Point in San Francisco which is arguably one of the most important military resources anywhere in California.

3.4.1 Property Type: Permanent Coastal Fortifications

Army planners recognized from the outset that the Golden Gate—the San Francisco and Marin counties entrance to San Francisco Harbor—represented, as one officer observed “the key to the whole Pacific Coast in a military point of view.”³⁰ The first large military construction contracts in California were for erection of coastal defense batteries at key locations: Fort Point in San Francisco (the site of a Mexican battery); Lime Point in Marin County, opposite Fort Point; and Alcatraz, the most accessible and centrally located of the three San Francisco Bay islands. A substantial battery was also built at Fort Mason, just south of the Presidio of San Francisco. Fort Mason was also the site of a Mexican-era battery and the land was claimed by the United States military because it had been used for military purposes by the previous regime. The Army did not occupy Fort Mason, however, until the Civil War and was forced to evict squatters from the site.

Different types of structures were planned for the three primary locations. Fort Point was awarded the greatest and most expensive project: a large enclosed (or casemated) gun battery. A smaller battery was constructed at Lime Point, and a secondary defensive position was built at Alcatraz, including a fortified barracks for soldiers.

The greatest and most intact structure from this program is Fort Point, a four-tier brick and stone fort, now nestled beneath the arched approach span for the Golden Gate Bridge (Figure 7). Fort Point was characterized as a “Third System” fortification, a term that was used by the Army to refer to different generations of permanent fortifications. The First System forts were built in the late 18th and early 19th century; Fort McHenry in Maryland is an example. Second System forts were built before and during the War of 1812; Castle Clinton in New York City is an example. The Third System forts were built between the War of 1812 and the Civil War. Fort Point is regarded as one of the best remaining examples of the Third System and was the only such fort to

³⁰Quoted in Thompson, 1979, 28.

be built on the West Coast. Many of the notable Third System forts in the northeast and south were badly damaged during the Civil War.³¹

Very little remains from the fortifications at Lime Point, which were never completed and were replaced during the late 19th century with new, more modern batteries. The fortified barracks at Alcatraz were completed but were largely displaced through construction of a military prison, and later, a Federal prison at this island site. The battery at Fort Mason has been preserved and a Civil War-era cannon re-installed at the site (Figure 8).

Examples:

- *Fort Point, San Francisco*—Listed in National Register.
- *Fortifications at Lime Point, Marin County*—Virtually nothing exists from this period.
- *Fortifications at Alcatraz, San Francisco*—Alcatraz is listed in the National Register, but chiefly with reference to the prison.
- *Fortifications at Fort Mason, San Francisco*—Listed in the National Register.

Registration Requirements

None of the examples listed above are on lands currently held by DoD, and it is unlikely that any additional permanent coastal fortifications exist on DoD lands. In terms of evaluating this property type elsewhere, the coastal fortifications are principally in a state of abandonment or ruins. The great exception, of course is Fort Point, which is one of the most intact Civil War-era forts in the United States, and which has already been evaluated and listed on the National Register.

The Frontier-era coastal fortifications are quite rare, especially compared with those from the late 19th and early 20th century, of which many more examples still remain. When evaluating these properties, therefore, it is important to balance the considerations of integrity and rarity. The standards of integrity may be somewhat lower for coastal fortifications from this period than the standards for the more common coastal fortifications from later periods. Since this property type is not believed to exist on DoD lands, specific registration requirements are not developed here.

³¹The various “Systems” are discussed in Emmanuel Raymond Lewis, *Seacoast Fortifications of the United States*. Annapolis: Naval Institute Press, 1970.



Figure 7. Civil War-era Battery Black Point at Fort Mason, San Francisco. This battery is rare among coastal defense battery sites as it has a gun in place, in this case a 10-inch Rodman cannon. (Source: JRP Historical Consulting Services.)

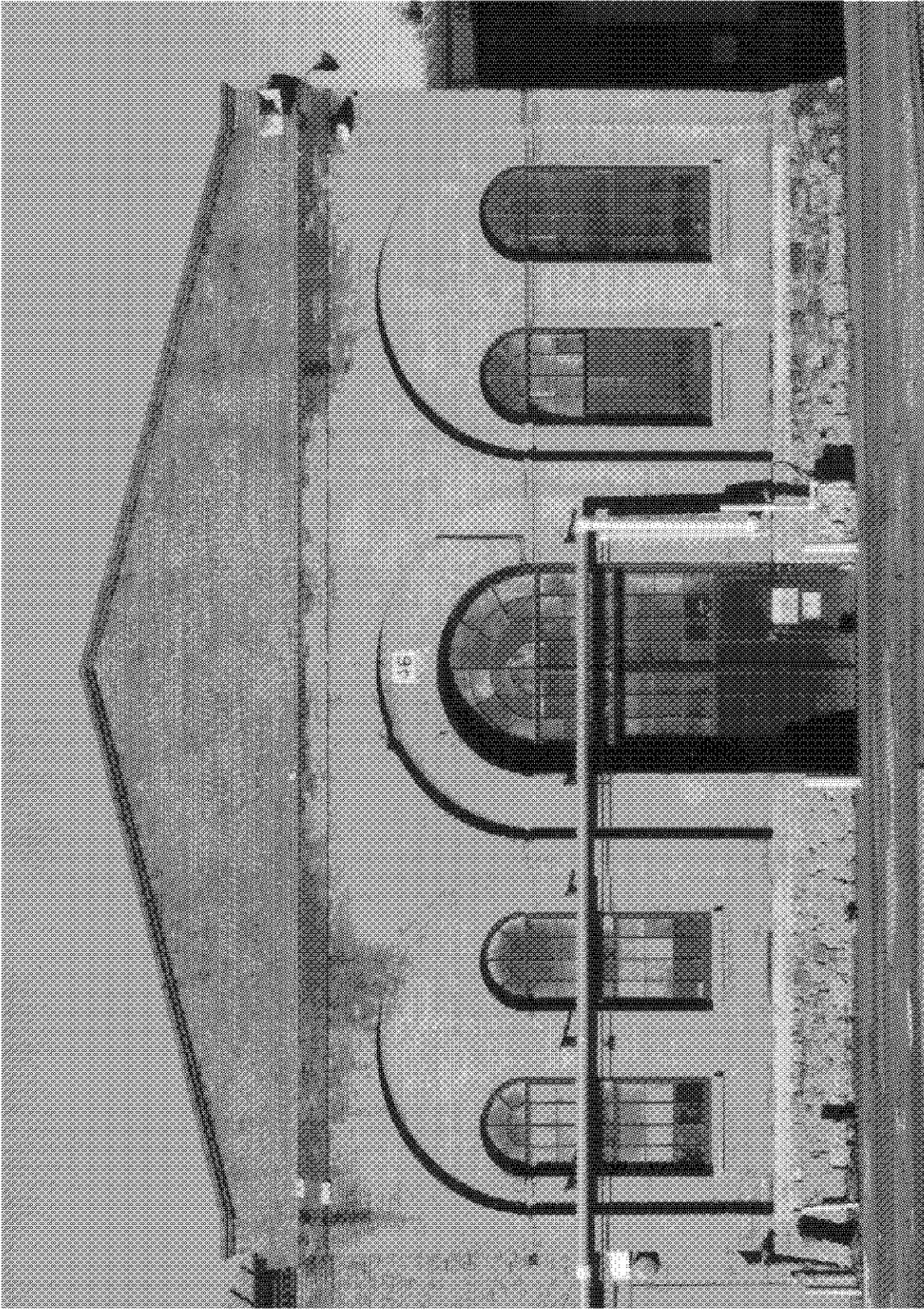


Figure 8. Building 46, Mare Island. This is the oldest shop building at Mare Island and one of the oldest and best-preserved industrial buildings anywhere in California. (Source: Historic American Buildings Survey, photographer William Dewey.)

3.4.2 Property Type: Island Barracks

As noted, the Army initially saw the defense of San Francisco Harbor being built around the works at Alcatraz, Lime Point, and Fort Point. During the Civil War, however, the Army grew increasingly concerned about the vulnerability of the harbor to the Navy of the Confederacy or any number of foreign powers. Gradually, the two remaining islands of San Francisco Bay—Angel Island and Yerba Buena Island—were pulled into the defensive strategy as well.

About 200 men were garrisoned at Angel Island to man the batteries there, beginning a long history of Army occupation and use of the island. Camp Reynolds, on the west side of the island, retains a handsome collection of Civil War-era buildings, including a group of officers' quarters. Two of the quarters had been built on Yerba Buena Island during the Civil War, but were moved to Angel Island when the coastal batteries on Yerba Buena were abandoned. Alcatraz was heavily fortified during the war years; in a sense, it took the place of the fortifications at Lime Point, which were never completed because of construction problems. Very little remains, however, from the extensive Civil War-era construction there.

Examples:

- *Camp Reynolds, Angel Island, Marin County*—Operated as a State Park.
- *Alcatraz Island, San Francisco County*—Little remains from the Civil War-era. Operated by NPS as part of the GGNRA.

Registration Requirements

The buildings at Camp Reynolds are highly important as resources associated with this theme and property type; there are no other examples in the state. They are also important in the more general context of Civil War military buildings. The buildings at Camp Reynolds on Angel Island comprise one of the most intact collections of Civil War-era buildings in the United States. None of these examples that have already been identified are located on DoD land. It is highly unlikely that any more representatives of this property type will be identified and almost certain no such properties will be found on land controlled by DoD. Therefore, no specific registration requirements for this property type are presented here.

3.5 THEME 5: MILITARY ARCHITECTURE OF THE FRONTIER ERA

Federal architecture before the Civil War, like American architecture generally, was dominated by the Greek Revival. The role of the Greek Revival in the architecture of the young Republic

has been analyzed at great length.³² The importance of this style to Federal architecture has not been explored to the same extent. Indeed, architectural historians have ignored the entire subject of Federal architecture to a surprising degree. The subject of military architecture has been overlooked to an even greater degree. Military design, of course, is a sub-set of Federal design, representing the work, in most cases, of architects employed directly by the government, in much the same manner as, say, post offices, custom houses, or court houses. The military, however, has its own traditions and functions and cannot be easily compared with most other Federal agencies. Those traditions must be taken into account in analyzing the relationship between military design and the rest of Federal design.

The best available treatment of Federal architecture is *The Federal Presence*, written by Lois Craig, et al.³³ This excellent study focuses on construction in Washington, D.C. It does address Federal design elsewhere, particularly that associated with the Treasury Department. The military is mentioned in passing, focusing chiefly on the military academies and the older East Coast bases. Although it rarely addresses the military specifically, Craig's work is still the best source for understanding the general trends in Federal architecture, trends that influenced, but did not dictate construction on military bases. Craig's general point is that Federal architectural fashions or trends roughly parallel trends in civilian architecture, although in a much more conservative manner. The fashions of civilian design ultimately made their way into Federal buildings, but typically sometime later than they appear in civilian buildings and in a more conservative interpretation. The same may be said of military design, although military architects were generally even more conservative than, say, the architects for the Treasury Department.

Prior to the Civil War, the dominant theme in all Federal architecture was Neo-classical, specifically Greek Revival. Greek Revival is arguably the most inclusive term that has been used to classify American architectural styles; many have used the more inclusive Classical Revival to denote the many Greco-Roman influences encompassed therein. The earliest Federal design assuredly was Greek Revival. That design established a tradition that persisted through the Great Depression and to some degree persists today. The military drew from that larger Federal architectural vocabulary. The earliest permanent military buildings at Mare Island, the Benicia Arsenal, and the Presidio of San Francisco were linked to that conservative tradition in the larger

³²There are many general sources that interpret the Greek Revival in the United States. One of the most useful in interpreting how the style evolved when transferred to the frontier is: Robert Kent Sutton, *America Interprets the Parthenon: the Progression of Greek Revival Architecture from the East Coast to Oregon, 1800-1860*. Niwot, Colorado: University of Colorado Press, 1992.

³³Lois A. Craig, *The Federal Presence: Architecture, Politics and National Design*. Cambridge, MA: MIT Press, 1984.

Federal program. Although Greek Revival was the style of choice for Federal buildings for many years, it persisted longer in the military than elsewhere. Early 20th century buildings at Mare Island, for example, are remarkably similar to those built in the 1850s.

3.5.1 Property Type: Officers' Quarters

There are very few unmodified officers' quarters left from this period. The officers' quarters at Mare Island were destroyed at the turn of the century. The officers quarters at the Benicia Arsenal, which were built as Greek Revival buildings, were modified in the late 19th century to present an Italianate design; that phenomenon is discussed in a later section. The only remaining examples are from the Army.

There exists a cluster of Greek Revival officers' quarters at Fort Mason that were private homes, built in the 1850s, but taken over by the Army when it reclaimed the land for military use. There also exist four Greek Revival homes at the Presidio of San Francisco, built in 1862. Two examples are shown in Figure 9. Equally impressive is a group of Greek Revival officers' quarters at Camp Reynolds on Angel Island, also dating to the Civil War.

Examples:

- *Buildings 6-10, officers' quarters, Presidio of San Francisco*—Listed in the National Register.
- *Homes at Camp Reynolds, Angel Island*—Part of Angel Island State Park.
- *Officers' quarters, Fort Mason, San Francisco*—Listed in the National Register as part of the Fort Mason Historic District.

Registration Requirements

Pre-1866 officers' quarters appear to be an exceedingly rare property type. None of the known examples are on DoD land. It is highly unlikely that any new examples of this property type will be discovered on active DoD installations. Therefore, registration requirements for this property type were not developed.

3.5.2 Property Type: Administrative Buildings

Administrative buildings were most amenable to Greek Revival design, because they were the most prominent buildings on any given base, were usually built to very permanent standards, and were expensive to build, justifying the costs in designing such buildings. More was involved, however, than economics. These permanent buildings, particularly headquarters buildings, were important symbolically in that they spoke to the permanence of the base as well. Army and Navy designers made showcases of prominent buildings for the same reason the Treasury Department

made a showcase of a courthouse or a major post office. A major post office represented the presence of the United States government in the community in which it was located. Similarly, a headquarters building symbolized the presence of the military in the community. The military likely selected the Greek Revival for headquarters buildings for much the same reason that the Treasury Department and other Federal departments used that style in their most prominent buildings.

Examples:

- *Building 47, headquarters at Mare Island*—Listed in the National Register.

Registration Requirements

Building 47 at Mare Island appears to be the only substantial example of this property type in California (see Figure 10). Although the Presidio of San Francisco and Benicia Arsenal are as old as Mare Island, these bases were not fitted with a permanent headquarters building on the scale of Building 47. The building has been modified extensively through additions and other alterations. Despite these modifications, this is one of the most important military buildings in California. It is arguably the most important icon signifying the long history of the Navy in California and on the West Coast. Since Building 47 at Mare Island is the only example of this property type and this building is already listed on the National Register, no registration requirements were developed.

3.5.3 Property Type: Utilitarian Buildings

Surprisingly, the best examples of the Greek Revival—and also the least modified—are the utilitarian buildings at the Presidio of San Francisco, Mare Island, and the Benicia Arsenal. Neither the Quartermaster Corps nor the Bureau of Yards and Docks (BuDocks) explained why they took such care in the design of these buildings, which had mundane functions, such as stables, powder magazines, and warehouses. The rationale for using the Greek Revival style for this property type is likely quite different than the reason for using such a style for residential or administrative buildings. One possible explanation is that these utilitarian buildings, in most cases, demanded solid and permanent materials and construction methods. In this era, permanence was almost always achieved through stone masonry or brick construction. Stone masonry or brick construction in turn lent itself most easily to Greek Revival design. The permanence of materials also helps explain the high degree of integrity that has been retained in these very old military buildings.



Figure 9. Officers' Quarters constructed in 1862 at the Presidio of San Francisco. These quarters, Buildings 5 through 16, were constructed as part of the Civil War build-up at the Presidio. The Greek Revival influence is restrained, but unmistakable. (Source: Historic American Buildings Survey, National Park Service.)



Figure 10. Headquarters (Building 47) at Mare Island. Although extensively modified, Building 47 is arguably the most impressive administrative building from this period in California. The spiky trees in the foreground are bunya-bunya trees. (Source: Historic American Buildings Survey, photographer William Dewey.)

Examples:

- *Building A1 at Mare Island*—the first magazine at the ammunition depot—Listed in the National Register.
- *“Camel Barns” at Benicia Arsenal*—Listed in the National Register.
- *Early shipyard shops at Mare Island*—Listed in the National Register.
- *Building 95, powder magazine, Presidio of San Francisco*—Listed in the National Register.

Registration Requirements

As discussed in a later chapter, military architects in the 1920s and 1930s espoused the principle of “total base design,” through which all aspects of base design would be integrated and governed by a consistent theme. The bases from the 1920s and 1930s took this concept to its logical conclusion; bases from this period were like master planned communities, with all aspects of architecture, landscape architecture, and site planning developed according to a rigorous program.

The “total base design” concept, however, was not new. Military architects of the 19th century followed the same general principle, applying the Greek Revival to virtually any type of permanent building on a military base, even utilitarian buildings. The utility buildings—stables, shops, storehouses, magazines—were often the most expensive and permanent buildings on a base and were built of brick or stone masonry. A large number of these have survived because they were so well built. As a result, some of the most impressive examples of Greek Revival architecture in California—military or civilian—are utilitarian buildings from the mid- and late-19th century.

As discussed throughout this document, virtually all 19th century military buildings in California are on bases that have closed. Ownership has passed, or soon will pass, to local authorities or NPS. The same is true of these 19th century Greek Revival utility buildings; therefore, no registration requirements are developed.

4.0 TRADITIONAL-ERA PROPERTIES, 1866-1902

This period begins with the end of the Civil War and ends with the Spanish American War and Philippine Insurrection. During the late 19th century, the Army and Navy in California and throughout the United States reverted to pre-Civil War troops levels. Nationally and in California, this is often regarded as a quiescent period for the military, during which little occurred in terms of technological innovation or major changes in military strategy or national military goals. The major military engagements of the period were the Indian wars, most of which were fought on the Great Plains or in the Rockies, although notable wars did occur in California, including the Modoc War of the 1870s. This relatively quiet period ended, however, with the Spanish-American War. Although a great success for the Army as well as the Navy, that brief war graphically demonstrated how antiquated the machinery and tactics of the American military had become. This realization helped usher in a great period of modernization during the early years of the 20th century (Section 5.0). That war also gave the United States its first overseas possessions, many of which were in the Pacific Ocean. The overseas territories would ultimately have a great impact on the military in California, which became the training ground, as well as the supply depot for troops headed to the Philippines and elsewhere.

This period has been called the “Traditional Era” because the Army and Navy held on to traditional forms, in their military structure as well as in their architecture. The buildings and structures from this period are of particular interest from the standpoint of architecture. If this was a period that honored tradition in terms of military strategy and structure, it was also a traditional period in terms of design, particularly with respect to buildings at the permanent bases. Three great bases represented the permanent presence of the military in California: the Navy’s shipyard at Mare Island, the Army’s arsenal at Benicia, and the Army’s barracks and headquarters at the Presidio of San Francisco. The buildings and structures at these bases include some of the finest 19th century architectural specimens in California, whether viewed from the civilian or the military perspective. The excellence in design extends to all types of buildings, from barracks to officers’ quarters to utilitarian buildings.

Perhaps the most significant point regarding this era is that virtually all of the bases discussed in this chapter have closed. Some, like the Benicia Arsenal and Fort Mason, have been closed for decades. Others, like the Presidio of San Francisco and Mare Island, have only closed in recent years, as part of the Base Realignment and Closure (BRAC) process. Although there are a few scattered late 19th century buildings on active bases, the military resources from this period have essentially passed from the control of DoD. The registration guidelines contained in this section

are of use chiefly to the various local governments and non-military Federal agencies that have accepted responsibility for the highly significant properties that reflect this important aspect of military history in California.

4.1 THEME 1: ARMY'S ROLE IN INLAND INDIAN WARS

The general trend in Army troop strength was a precipitous drop after the Civil War, followed by gradual build up towards the Spanish-American War. The Presidio of San Francisco, for example, had about 1,000 troops during the Civil War, a figure that dropped to 250 immediately after the war but grew to about 600 in the late 1880s.³⁴ The main reason for increasing troop strength from the late 1860s to the 1880s was the persistence of the Indian wars in the West.

The Presidio of San Francisco served two purposes during the Indian wars. It was a temporary home to thousands of soldiers who were assigned to the war zones on the Great Plains and the Rocky Mountains. In addition, the soldiers assigned permanently to the Presidio of San Francisco were called upon to serve in some of the longest and most violent engagements, including the Modoc War in California, the Nez Perce War in Idaho, and the Apache uprisings in Arizona.

Thus, the most common Army building type from this period was the barracks. Other buildings were constructed, however, as both the Presidio of San Francisco and the Benicia Arsenal matured into permanent and well-planned military communities.

4.1.1 Property Type: Barracks

The Army built a large number of barracks at the Presidio of San Francisco during the late 19th century, as well as a smaller number at the Benicia Arsenal (see Figure 11). The dozen or so barracks that remain at these two facilities are the best examples in California, and some of the best examples in the nation, of a classic 19th century building type — the two story, side-gabled, Greek Revival-influenced barracks, usually made of brick, with a one- or two-story porch along one side (see also Section 4.4.1). All of these buildings appear to be in good condition.

Examples:

- *Buildings 127 and 128 at the Benicia Arsenal*—Listed in the National Register.
- *Buildings 86 and 87 at the Presidio of San Francisco*—These were built as one-story barracks during the Civil War, but expanded to two stories during this period. Listed in the National Register as part of the Presidio of San Francisco Historic District.

³⁴National Park Service, "Presidio of San Francisco National Historic Landmark District," 1993, 7-35.



Figure 11. Late 19th century barracks at Benicia. These barracks were typical of permanent Army barracks from this period. (Source: Foster Wheeler Environmental Corporation.)

- *Buildings 101 through 105 at the Presidio of San Francisco*—Listed in the National Register as part of the Presidio of San Francisco Historic District.

Registration Requirements

All examples of this important property type are now controlled by parties other than DoD and are already listed on the National Register. It is highly unlikely that any more examples will be found on active military installations. Therefore, no registration requirements are provided here.

4.1.2 Property Type: Non-Barracks Army Buildings

The assets of the Army during this period were concentrated in the San Francisco Bay Area, although a number of the temporary frontier forts remained in place through the 1880s and a few through the 1890s. As the Army matured, its physical plant became more diverse and varied, with respect to buildings in each post, as well as the diversity of the types of posts. The Presidio of San Francisco, the Benicia Arsenal, and Fort Mason reflect this diversity, in the different types of buildings on each base as well as the distinctly different character for the three bases. During this period, both the Presidio of San Francisco and the Benicia Arsenal matured into fully developed Army posts.

The Presidio matured along with the City of San Francisco. More than a century ago, the Presidio of San Francisco established its character as a handsome and distinctly urban Army post. By the end of the century, the post was no longer isolated at the entrance to the Golden Gate. One symbolic indication of the relationship between the city and the post was the reorientation of Buildings 5 through 16, officers' quarters that were built during the Civil War. Following longstanding Army traditions, these buildings faced inward, toward the parade ground, a fact that also left their backyards, including privies and stables, facing the emerging neighborhoods in the Presidio Heights. As a gesture of accommodation, the Army, in the late 1870s, rebuilt the front and rear elevations of these buildings, moving the fronts to face the city along Funston Avenue. This reorientation of officers' quarters away from the parade ground is thought to be unprecedented in the history of the Army in the United States.³⁵

The Benicia Arsenal, by contrast, was a remote and distinctively blue-collar Army post. The Benicia Arsenal was always more industrial in character than the Presidio of San Francisco, and the buildings from this period reflect that fact. Nonetheless, the arsenal did gain many of the

³⁵This contention is made in National Park Service, "Presidio of San Francisco National Historic Landmark District," 1993, 7-35.

accoutrements of a mature Army post, although many of the non-industrial buildings have been lost.

Examples:

- *Buildings from this period at the Presidio of San Francisco*—Dozens of such buildings remain, including core buildings along the parade grounds. Listed in the National Register.
- *Buildings from this period at the Benicia Arsenal*—These form the core buildings at this facility. Listed in the National Register.

Registration Requirements

All examples of this important property type are now controlled by parties other than DoD and are already listed on the National Register. It is highly unlikely that any more examples will be found on active military installations. Therefore, no registration requirements are provided here.

4.1.3 Property Type: Battlefield Sites in California

The Army in California played its most important role in providing troops and supplies for the major Indian wars on the Great Plains and in the Rocky Mountains. The Indian-white hostilities in California that preoccupied the Army during the 1850s and 1860s had largely faded during this period. There were, however, notable exceptions, particularly the Modoc War of the early 1870s. Although the hostilities dated to the 1850s, the Army and the Modoc fought their most pitched battles in the winter of 1872 and the spring of 1873. The Army lost 76 men, including General E.R.S. Canby.³⁶

Examples:

- *Modoc War sites, including Captain Jack's Stronghold, Modoc County*—Listed in the National Register; owned by NPS.

Registration Requirements

Battlefield sites, as indicated in an earlier chapter, should be evaluated in the manner prescribed in National Register Bulletin 40.³⁷ There is no indication that any Modoc War sites are under DoD control. The sites of numerous smaller encounters may exist on the lands of the larger bases, such as NAWS China Lake, Edwards AFB, Vandenberg AFB, and Fort Irwin.

³⁶The Modoc War has been addressed from the standpoint of historic preservation and public interpretation in: Erwin N. Thompson, "Modoc War: Its Military History and Topography," Sacramento, 1971.

³⁷ Keeper of the National Register, "Bulletin 40: Guidelines for Identifying, Evaluating, and Registering America's Historic Battlefields," n.d.

4.2 THEME 2: NAVY'S ROLE IN SUPPORT OF THE PACIFIC SQUADRON

As was the case during the Frontier Era, the presence of the Army was far greater in California than was that of the Navy, simply because the Army forces were still scattered throughout the state. The Navy's presence was far more concentrated at its one great station, the Mare Island Naval Shipyard.

The fact that the naval presence was so concentrated helps to explain the diversity and significance of the buildings and structures at Mare Island. Although it existed chiefly to repair ships, the Mare Island facility was always much more than a shipyard. Because it was the only Navy facility in California, and for many years the only naval station on the West Coast, Mare Island was regarded as a multiple-purpose station, to be fitted with any and every building or structure that might be of use to the Navy. It was home, for example, to the Navy's principal ammunition depot in the West. It also had the Navy's only hospital in the West. It included buildings and structures for the only substantial Marine Corps facility in California of this period.

As a result, the Mare Island buildings and structures from the late 19th century fall into a multitude of property types, only part of which relate to the primary ship-repair function. Although the 1854 master plan for Mare Island had envisioned at least one permanent dry dock, the Navy made do with temporary, floating dry docks in the early years.

4.2.1 Property Type: Dry Docks

For various reasons, construction of the planned permanent dry dock was delayed until the mid-1870s. The first stone was laid in 1874 and the great granite basin was finally completed in 1894. It had been designed by the civil engineer at the station, Calvin Brown, who had toured dry docks elsewhere in the United States and in Europe before deciding upon a design. Owing to the permanence of its granite construction, the structure is almost completely unmodified.

Examples:

- *Dry Dock 1, Mare Island*—Listed as a key contributor to the Mare Island Historic District.

Registration Requirements

Dry Dock 1 at Mare Island is a remarkably important structure in two regards. First, it was the first, and for some time, the only permanent dry dock on the West Coast. Equally important, it is probably the most massive granite structure ever built in California, a state filled with 19th century granite buildings and structures. It is exceedingly unlikely that any other example of this

property type will be found on land controlled by DoD. This property is already listed in the National Register. Therefore, no registration requirements are provided here.

4.2.2 Property Type: Navy Shops

As the 19th century progressed, the Navy continued to build substantial brick shops buildings along the waterfront at Mare Island. Typically, the new buildings were attached to the older shops, creating more useful open work areas and allowing for easy movement of parts and machinery from one shop to the next. As a result, the brick shops at Mare Island exist in a series of complexes. Although the new wings were assigned new building numbers, the complexes were unified structurally and architecturally. As discussed earlier, the late 19th century shops differed little architecturally from the industrial buildings of the 1850s and 1860s.

Examples:

- *Various late 19th century shops at Mare Island*—Listed in the National Register.

Registration Requirements

All known examples of this property type exist at Mare Island and are no longer under DoD control. All have been listed in the National Register and are part of a NHL. Therefore, no registration requirements are needed.

4.2.3 Property Type: Non-Shipyard Buildings from this Period

Between 1865 and 1902, Mare Island gradually matured into a multiple-purpose naval station. As the Navy saw a need for a new function, it simply built a new area at Mare Island to fulfill that need. As a result, the Mare Island historic district exists in distinct zones which reflect the new functions that were assigned to the facility: expansion of the ammunition depot into a major facility; construction of a Naval Hospital; establishment of a major Marine Corps facility; expansion of the housing and administrative areas; and other major improvements. The tremendous diversity of functional building types at Mare Island is one of the great strengths of the historic district.

The functional diversity paralleled architectural diversity as well. The Marine Corps adopted a distinct “style” for its buildings that differed from the general architectural program established by the Navy. The hospital complex, which was a separate command at Mare Island, also developed along lines that suited its needs, and the hospital represents a distinct sub-district at Mare Island. The diversity may also be seen as a liability as the base lost its architectural cohesiveness over time. The breakdown of the architectural program may be attributed to the diversity of function, as well as the passage of time and evolving architectural trends. By the

early 20th century, the Navy had abandoned its commitment to the Greek Revival and adopted Colonial Revival, Mission Revival, and other fashionable styles of the period.

Examples:

- *Late 19th century buildings in the Ammunition Depot, Hospital, Marine Corps, and Administrative-Residential areas of the Mare Island Historic District*—Listed in the National Register as part of the Mare Island Historic District.

Registration Requirements

All examples of this property type in California exist at Mare Island, which is no longer military-owned. Since these properties are already listed in the National Register, no registration requirements are offered here.

4.3 THEME 3: TRADITIONAL-ERA COASTAL DEFENSE

4.3.1 Property Type: Coastal Defense Batteries

The experience of the Civil War convinced the Army, which retained responsibility for coastal defense, that an entirely new coastal defense strategy was needed. Pre-war coastal defense batteries had been built around large fortified buildings (forts), of which Fort Point in San Francisco is an excellent example. During the war, however, these forts had been shown to be vulnerable to attack by modern naval guns and artillery pieces. The most active period of coastal defense construction, except for the feverish pace during World War II, extends from the 1880s through the early years of the 20th century, spanning this period and the following era, called the “Modernization Era” in this report (Chapter 5.0). Construction was concentrated in three areas: San Francisco Bay (San Francisco and Marin counties); Los Angeles Harbor; and at Point Loma in San Diego.

During the 1870s and again in the 1890s, the Army sought to install new generations of coastal defense batteries at selected locations along the California coast: in San Francisco and Marin counties, at the entrance to the Golden Gate; on the Palos Verde Peninsula at the entrance to Los Angeles Harbor; and on Point Loma, at the entrance to San Diego Harbor. In a related measure, the Army sought to develop the capacity to plant mines in the major harbors of the state to defend against incursions by enemy ships.

This modernization proceeded in two distinct phases during this period: during the 1870s and again in the late 1880s and early 1890s. The batteries from the 1870s were seen as temporary structures, designed to handle harbor defenses until a more permanent design was developed. Batteries from the 1870s were built at the entrance to San Francisco Bay, near Fort Point on the

Presidio of San Francisco, and on the Marin Headland, on the opposite side of the Golden Gate. Work began on batteries at Point Loma, but was abandoned before it was completed.

The batteries from the 1870s were essentially somewhat more permanent versions of the temporary earthen berms that had been constructed during the Civil War, with concrete gun platforms replacing wooden wartime structures, and brick and concrete breast height walls replacing the earthen berms of the war years.³⁸ Very few of these structures were built and fewer remain.

A far more ambitious construction program was initiated in the 1880s, 1890s, and early 20th century. The impetus for this new construction was the Endicott Commission, a board convened in 1885 specifically to recommend new structures and strategies for coastal defense. Batteries from the late 19th century are commonly called “Endicott Era” facilities, or “Endicott System” batteries. The new design emphasized subterranean gun emplacements, built behind rock and reinforced concrete barriers. These large gun emplacements, designed to fire on naval vessels, were to be joined by smaller, more temporary guns that would be trained on landing craft.

Although the Endicott Board attached a great urgency to the installation of these new batteries, relatively few were ever built. In the early 20th century, President Theodore Roosevelt convened another commission, called the Taft Board (after William Howard Taft), which recommended completion of batteries that were similar in many respects to those called for in the Endicott recommendations (see Section 5.8.1).

Examples:

- *Batteries East and West at Presidio of San Francisco, built in the late 1860s*—Listed as part of the Presidio of San Francisco Historic District and NHL.
- *Batteries Godfrey, Howe-Wagner, Dynamite and others, built during the 1890s*—Listed as part of the Presidio of San Francisco Historic District and NHL.
- *Batteries at Fort Rosecrans, now part of the Space and Naval Warfare Systems Center (SSC) and Submarine Base at Point Loma in San Diego*—The batteries are divided between the Submarine Base and the SSC, with more batteries existing at the SSC than at the Submarine Base.
- *Fort Baker batteries, built during the 1870s and 1890s*—Listed in the National Register as part of Forts Baker, Barry and Cronkhite Historic District.

³⁸These are discussed in detail in Erwin N. Thompson, “Historic Resource Study, Seacoast Fortifications, San Francisco Harbor, Golden Gate National Recreation Area, California,” May 1979 and in National Park Service, “Presidio of San Francisco National Historic Landmark District,” 1993.

- *Battery remnants on Angel Island and Alcatraz Island*—Listed in the National Register.
- *Fortifications at Fort Mason*, dating to 1870s and 1890s—Listed in the National Register.

Registration Requirements

As discussed earlier (Section 3.4), coastal defense batteries may be seen as one of the most thoroughly inventoried and most successfully registered military property types in California. This is true for 19th century, early 20th century, and for World War II-era batteries.

The late 19th century coastal defense properties that have been inventoried and evaluated to date are all located on parklands, controlled by either NPS or the California State Park System. (The Point Loma batteries date to the early 20th century.) The NPS-owned San Francisco Bay Area batteries that remain from this period straddle the line between structures and ruins; none are entirely intact and many are in ruins. NPS has developed a very extensive historic context for this property type. It appears that every battery that has been identified has been listed in or determined eligible for listing in the National Register.

It is unlikely that previously unknown resources will be identified. If new examples were to be discovered, these should be inventoried and evaluated, taking into account the state of registration of such properties. Given this very high rate of registration, any new discoveries should be evaluated for strength of association, integrity, and rarity. Evaluations of this property should ask the question: Does a new battery include qualities that differ from or represent a significant example of a property type that has already been listed in great numbers?

4.3.2 Property Type: Mine Assembly Buildings

Gun batteries were not the only property types associated with the general theme of coastal defense. A secondary, but nonetheless important, strategy was to mine the harbor during time of war or expected attack. Although used during the Civil War, the submarine mine was only perfected after the war and was not widely available until late in the 19th century. During the 1880s, the Army decided to develop a mine capability to be used in San Francisco Bay, as needed. (San Francisco Bay was armed with mines later during the Spanish-American War). This strategy required construction of a building that could be used to assemble and arm the “torpedoes,” the term used for mines during these years. One such building was constructed on the eastern end of Yerba Buena Island in San Francisco Bay. This building was completed in 1890 and still exists.

Examples:

- *Torpedo assembly building on Yerba Buena Island* (formerly part of Naval Station Treasure Island)—Determined eligible for listing in the National Register.

Registration Requirements

The “torpedo” building at Yerba Buena Island appears to be highly significant in several respects. It was directly associated with an important element of coastal defense strategy in San Francisco Bay. It is quite a rare example of its type; indeed, it appears to be unique in California. Furthermore, it retains an extraordinarily high degree of integrity. It is also significant in another respect: it was a very early reinforced concrete building and Ernest L. Ransome designed it. Ransome was one of the most important pioneers of reinforced concrete construction; for example, he designed the world’s first reinforced concrete bridge. About 1900, he left San Francisco for Chicago and did not return. Any of his early concrete buildings or structures should be regarded as highly significant in the field of technological history. Thus, in all respects, the torpedo building at Yerba Buena Island is a rare and important resource. It is controlled by the Navy and will soon be transferred to the city and county of San Francisco.

4.4 THEME 4: MILITARY ARCHITECTURE OF THE TRADITIONAL ERA

Nothing better signifies the traditional, conservative character of the military during this period than its architecture. The military held to tradition in its strategies and force structure; so, too, did it hold to tradition in the design of its buildings and structures. The late 19th century generally represented the most flamboyant era in American civilian architecture. In California, this was the era of the Carson Mansion in Eureka, the Governor’s Mansion in Sacramento, and hundreds of busy Victorian homes in San Francisco, sometimes called the “painted ladies” for their exuberant use of color and applied ornamentation. The military, by contrast, held to traditional forms and styles during this era. The differences between pre- and post-Civil War military design is subtle and largely imperceptible.

The best representation of the traditional, conservative character of military design during this period is the continued use of the Greek Revival style. Greek Revival, the architectural language of the young Republic, had largely faded from civilian favor by the end of the Civil War. The style remained popular, however, for construction of monumental civic buildings and, to a lesser degree, in the design of large commercial and social buildings. To a remarkable extent, however, the military clung to the Greek Revival throughout the 19th century, using this as the artistic vocabulary for every type of building, including quarters, barracks, storehouses, stables, and industrial shops.

In time, the military would adopt a few of the period revival styles that dominated civilian design in California and elsewhere during the late 19th century, especially in the design of officers' quarters. For example, period revival and Victorian homes were built here and there on California military bases during the late 19th century. These were the exceptions, however, not the rule.

In addition to its work on military buildings, military designers in the late 19th century began to work on the landscape architecture of California bases. This work was typically called "base beautification," a term that reflects both the intent and the effect of the effort. Base beautification was important at Mare Island in that the landscaping helped buffer residential areas from the industrial sites along the waterfront. Beautification was especially important at the Presidio of San Francisco, a base blessed with a prime natural location at the Golden Gate. The Army's landscaping was so successful that the base was transformed into a National Park with little effort, once the post was closed as a military installation in the 1990s.

An impressive group of resources still exist to commemorate and illustrate this era in military architecture. Virtually all of these properties, however, are on military bases that have closed and transferred to local governments or to NPS.

4.4.1 Property Type: Greek Revival Barracks

Army barracks represent one of the most predictable and common military property types. Barracks design remained much the same throughout the 19th and early 20th centuries. Barracks were large structures built around open sleeping bays, often with attached mess halls and common areas. Each was designed to accommodate a large number of enlisted personnel, making these among the largest buildings to be found on any given military base.

Because they were so large, barracks were also quite amenable to Fine Arts architectural treatment. On any given base, the greatest care in design was likely to be given to three building types: the large barracks, the headquarters and other key administrative buildings, and the homes for senior officers. Figure 12 shows an example of Greek Revival barracks design, from Fort Rosecrans, Point Loma.

Examples:

- *Barracks at Presidio of San Francisco*—Including Buildings 86 and 87, built in the 1860s, but remodeled in the 1880s; and Buildings 101 through 105, built in the 1890s. Listed in the National Register as part of an historic district and listed as part of a NHL.

- *Barracks at the Benicia Arsenal*—Including Buildings 126, 127, and 128, built in the 1870s. Listed in the National Register.
- *Barracks at Fort Rosecrans, Point Loma*—Built in 1902. Listed in the National Register.

Registration Requirements

As noted, the major permanent facilities from this period — the Benicia Arsenal, Presidio of San Francisco, and Mare Island Naval Shipyard — have all closed and have been or soon will be transferred from DoD control. It appears that no 19th century barracks exist today on land controlled by any branch of the military. The barracks at Fort Rosecrans, Navy-owned, which illustrate this theme in this period, but were built in the early years of the 20th century (see Figure 12). Properties of this type are, however, still found in substantial numbers at the Presidio of San Francisco and at the Benicia Arsenal. It is quite likely that every building of this sort still in existence has been listed in the National Register. Therefore, no registration requirements are offered here.

4.4.2 Property Type: Greek Revival Officers' Quarters

Senior Officers' Quarters—large single family homes for ranking officers—were apparently regarded as among the most important assignments for architects working at BuDocks or the Quartermaster Corps.³⁹ In an integrated design strategy, the senior officers' quarters were sited prominently in an Officers' Row, typically located near the main administration building. These buildings were highly important to the site planning of a base and in defining its architectural character.

Examples:

- *No known remaining examples.*

Registration Requirements

By a series of historical accidents, all examples of this theme have apparently disappeared. Mare Island Navy Shipyard included a stately group of brick Greek Revival homes as part of its original plan, but these buildings were destroyed in an earthquake in 1898. Remaining officers' quarters at the Benicia Arsenal and the Presidio of San Francisco were designed in other popular 19th century styles. Some Greek Revival buildings may remain from the frontier outposts of this period. It is highly unlikely, however, that any representatives of this property type still exist on land controlled by DoD. Therefore, no registration requirements are offered here.

³⁹This analysis of architectural traditions in military family housing is informed by an excellent national context: Bethany Grashof, "A Study of United States Family Housing: Standardized Plans, 1866-1940." Atlanta, 1986. California buildings generally conform to national trends, with notable exception discussed below. Grashof's analysis, of course, is restricted to the Army.



SHEET NO. 3 9 SHEETS
BARRACK BUILDING FOR 110 MEN
AT FORT ROSECRANS, CAL.
O.M.G.O. OCT. 1902.

Figure 12. Side elevation for barracks at Fort Rosecrans. Although built in 1902, this building demonstrates the persistence of the Greek Revival in Army design, even into the early years of the 20th century. (Source: San Buenaventura Research.)

4.4.3 Property Type: Greek Revival Utilitarian Buildings

The architectural unity of late 19th century military bases extended even to seemingly utilitarian structures, such as stables, shops, magazines, and warehouses. Indeed, some of the best examples of this architectural tradition are to be found among these building types. This trend began during the early years of military construction at the Presidio of San Francisco, at the Benicia Arsenal, and at Mare Island. Construction during the late 19th century continued that trend, creating bases that were unified architecturally around the neoclassical architectural program, from the ceremonially important buildings to the warehouses, magazines, and other utilitarian buildings. Figure 13 depicts late 19th century shops at Mare Island.

Examples:

- *Late 19th century shops at Mare Island*—Listed in the National Register as part of Mare Island Historic District.
- *Building 88, stables at Mare Island*—Listed in the National Register as part of Mare Island Historic District.
- *Storehouse (Building 223) at Presidio of San Francisco*—Listed in the National Register as part of the Presidio of San Francisco Historic District.
- *Shops 55, 56, and 57 at the Benicia Arsenal*—Listed in the National Register.

Registration Requirements

As noted throughout this volume, virtually all important late 19th century military buildings have passed from the control of DoD. This is certainly true of the architecturally significant utilitarian buildings. The Navy shipyard at Mare Island and the Army's Presidio of Monterey and Benicia Arsenal represent the great repositories of buildings that reflect or embody this theme. It is highly unlikely that any new buildings of this sort will be discovered on active military bases. Therefore, no registration requirements are offered here.

4.4.4 Property Type: Gothic Revival Buildings

Although the military was generally traditional in its design during these years, it was not altogether isolated from the architectural tendencies of the time, which were toward a multitude of period revivals and toward increasingly exuberant use of applied decorative elements. Such period revival and Victorian homes were built here and there during the late 19th century on California military bases. These were the exceptions, however, not the rule.

The Gothic Revival was rarely built on California military bases. Nonetheless, one of the finest examples of late 19th century military design and construction was a building of this style: the great Main Arsenal Storehouse at the Benicia Arsenal (see Figure 14).

Examples:

- *Main storehouse at Benicia Arsenal*—Listed in the National Register.

Registration Requirements

Gothic Revival military buildings in California are exceedingly rare. The value of the great storehouse at the Benicia Arsenal is magnified as a result. This property is no longer military-owned and is already listed on the National Register. Since the storehouse appears to be the only example of this property type, no registration requirements are provided here.

4.4.5 Property Type: Queen Anne and Other Victorian Buildings

Military designers in California were apparently reluctant to adopt the most exuberant of the late 19th century styles – the various sub-styles that are traditionally lumped as “Victorian architecture.” This reluctance was not necessarily the case for military design nationwide; Victorian design was often used for officers’ quarters elsewhere in the United States.⁴⁰ Whatever the explanation, it appears that there are only three standing examples of this property type in California: Buildings M2, M3, and M4 at Mare Island.

Examples:

- *Marine Corps Officers’ Quarters (Buildings M2, M3, and M4) at Mare Island*—Listed in the National Register as part of Mare Island Historic District.

Registration Requirements

The dearth of Victorian homes at California military installations is interesting because it appears that these were built in great numbers elsewhere. There is no obvious explanation for this regional anomaly. It does appear, however, that the three homes comprising Marine Corps officers’ quarters at Mare Island, are highly unusual and valuable in that regard. Since these registered properties appear to be the only standing examples of their type, no registration requirements are offered here.

⁴⁰ See Grashof, 1986 for a discussion of Victorian architecture for officers’ quarters on Army posts.



Figure 13. Late 19th century shops at Mare Island. The "streetscape" along the waterfront at Mare Island is a key element of the industrial landscape of California. (Source: Historic American Buildings Survey, photographer William Dewey)

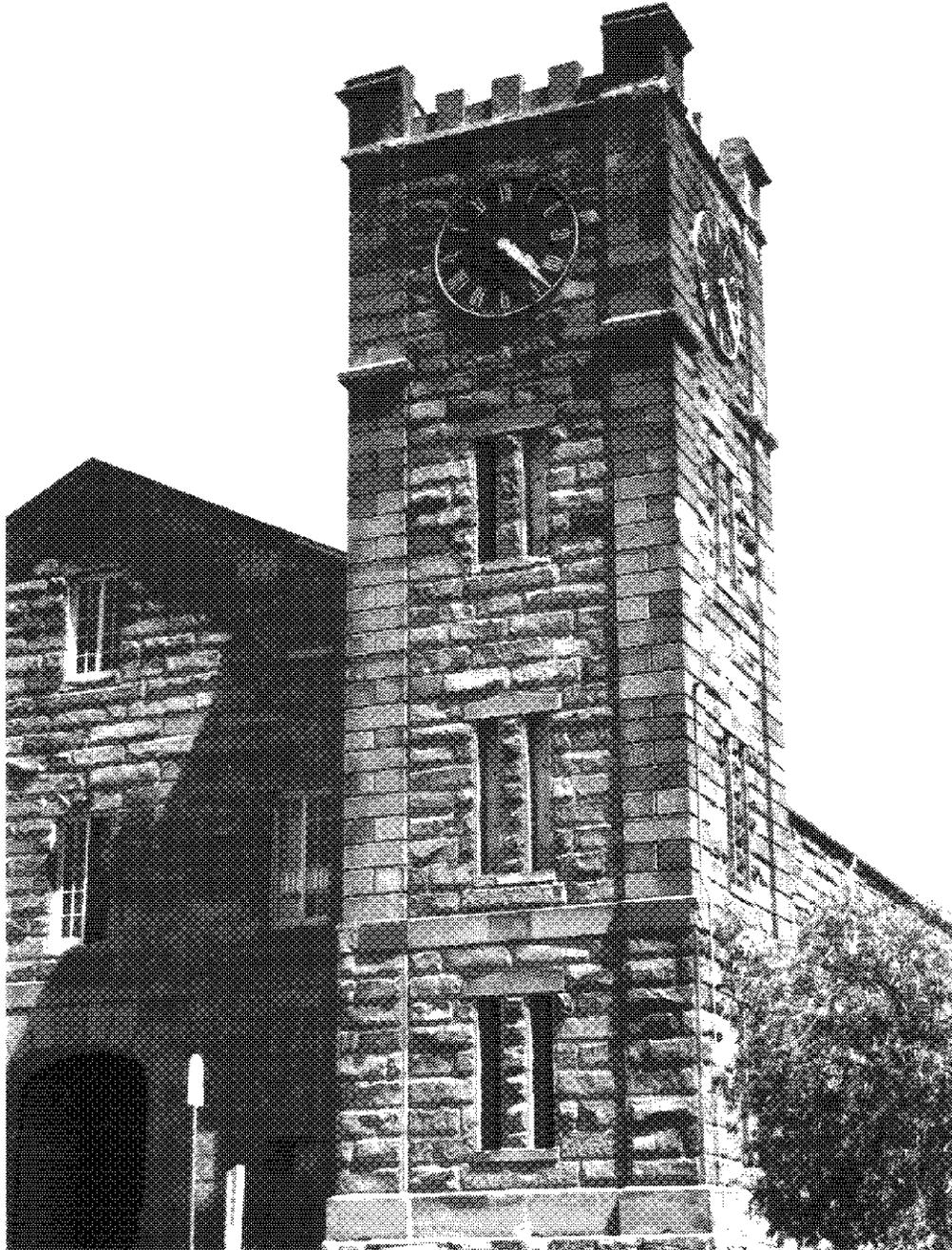


Figure 14. Gothic storehouse with its grand clock tower at the Benicia Arsenal. Completed in 1859, it was substantially rebuilt following an explosion and fire in 1912. (Source: Foster Wheeler Environmental Corporation.)

4.4.6 Property Type: Other 19th Century Building Styles

Italianate design was apparently regarded as acceptable among the tradition-oriented architects for the Army and Navy, at least with respect to officers' quarters. In 1893, the Army built a Second Empire style officers' quarters at the Presidio of San Francisco.⁴¹ The earliest Marine Corps Commander's home at Mare Island was an Italianate building. In the 1870s, the simple Greek Revival officers' quarters at the Benicia Arsenal, built in the 1860s, were remodeled into Italianate buildings.

The Second Empire and Italianate homes at the Presidio of San Francisco, Benicia Arsenal, and Mare Island add to our understanding of how the military design bureaus went about planning for the 19th century bases. They generally attempted to hold to a unified base theme or architectural program. They were also influenced by designs that had been developed successfully for other bases. The Grashof study of Army quarters demonstrates how "standardized" plans in the 19th century were simply plans that were developed at one site and copied at other sites. The occasional period revival home on California military bases probably reflects that tradition.

Examples:

- *Officers' quarters at Benicia Arsenal*—Listed in the National Register.
- *Building M1 (Italianate home of the Marine Corps Commander) at Mare Island*—Listed in the National Register as part of Mare Island Historic District.
- *Building 65, a Second Empire Style home at the Presidio of San Francisco*—Listed in the National Register as part of the Presidio San Francisco Historic District.

Registration Requirements

There are no known examples of any of these property types on a base still controlled by DoD, and such examples are unlikely to exist on DoD land. Good non-DoD examples of this property type are already listed on the National Register. Therefore, no registration requirements are provided here.

4.4.7 Property Type: Late 19th Century Landscape Architecture

During the late 19th century, base planners began for the first time to plan for formal landscaping at the permanent bases in the state. Nowhere was this more evident than at the Presidio of San Francisco and the Naval Shipyard at Mare Island, the two great bases from the period. These landscaping efforts began tentatively and without formal plans. In fact, at both bases, base beautification, a common term used to refer chiefly to landscaping, rarely proceeded along

⁴¹The Army built homes in the Second Empire at various posts throughout the United States; see Grashof, 1986.

formal plans.⁴² To the military, beautification involved plantings but also involved structures such as flagpoles, gazebos, and weapons, usually antique at the time they were installed. Certain elements of the landscape, particularly parade grounds, were defined through traditional and functional design considerations. The mix of plant species and general layout for the plantings, however, appears to have evolved and did not develop according to a coherent master plan.

In time, however, these two bases, especially the Presidio of San Francisco, evolved into some of the most complex man-made landscapes in the state. In the 1990s, the transition of the Presidio of San Francisco from military base to national recreation area was eased considerably due to this long tradition.

Examples:

- *Landscaping at Presidio of San Francisco*—Identified as a contributing element of the San Francisco Historic District.
- *Early landscaping efforts at Mare Island*—Identified as a contributing element of the Mare Island Historic District.

Registration Requirements

Landscape architecture has been recognized as a contributing element of the Mare Island and the Presidio of San Francisco historic districts. For the non-military custodians of these resources, the landscape should be regarded as a highly important element of the resources. The military no longer controls the landscaping elements at the 19th century bases, and it is unlikely that similar examples of landscaping from this period will be discovered on land still owned by DoD. Therefore, no registration requirements are provided for this property type.

⁴²Landscaping is discussed at length in the National Register nominations for both districts.

5.0 MODERNIZATION-ERA PROPERTIES, 1903-1918

This era begins with the Philippine Insurrection and ends with the end of World War I. This was a period of great technological modernization for the military, nationally and in California. It was, of course, also an era of rapid technological change in the civilian world and many of the new instruments of war were derived from innovations that had a strong civilian market as well. During this period, the Navy and Army quickly adopted a series of important new technologies, including the motorized vehicle, the airplane, radio communication, the tank, and the submarine. These new tools and equipment required new types of facilities, including entirely new bases and new types of buildings on the older installations.

The modernization of the military during this period had a profound impact on the building stock at California installations. The most significant impact was in the creation of entirely new types of buildings to handle functions that previously did not exist, such as aircraft hangars, submarine repair facilities, and radio communication stations. In addition, the Marine Corps was fitted with its first independent station during this period, beginning the long drive toward autonomy for the Marines.

Architecturally, the bases from this period are characterized by two seemingly contradictory trends, one affecting residential and administrative buildings, the other affecting shops and utilitarian buildings. As noted, the trend in 19th century design was toward unity between residential and utilitarian buildings. The 19th century shops at Mare Island, for example, were designed in the same Greek Revival architecture as the residences. The same held true at the Benicia Arsenal and the Presidio of San Francisco. In the early 20th century, however, the trend was toward a strictly modern, functional design for utilitarian buildings, while retaining more traditional designs for residential and administrative buildings. This trend is most evident in the design of buildings and structures at Mare Island, which was forced to rebuild much of its building stock following a major earthquake in 1898. The new shops buildings were as modern as the new automobile factories after which they were patterned. The residential buildings, by contrast, were designed in the Colonial Revival Style, which had much in common with the traditional Greek Revival building stock it replaced.

The Modernization Era should be of particular interest to managers of military bases. This is the oldest period in which a substantial number of historic properties still remain and are still under the control of DoD. Properties from the Frontier and Traditional eras of the 19th century are arguably more important in the abstract. Nearly all of these, however, have passed from control

of the military. DoD, however, still controls most of the buildings constructed during the early 20th century. As a management issue, these properties deserve special attention.

5.1 THEME 1: ARMY ADOPTS THE AIRPLANE

The military acquisition of the airplane as an instrument of war during the early 20th century represents one of the most rapid adoptions of a new technology in American military history. This development was particularly important to California because it stimulated a vigorous civilian aircraft manufacturing capability, which would remain a mainstay of the California economy through the Cold War years. A major part of the Army's, and later the Air Force's, aviation assets would be centered in California. The decision to establish the nation's earliest air bases in California during this period set in motion one of the most important economic developments in the state's history. California is sometimes called the birthplace of military aviation.⁴³ That distinction owes chiefly to the role of what is now NAS North Island, near San Diego. NAS North Island has the distinction of being the first facility of the Air Corps (the modern Air Force) and the first airfield for Navy aviation.⁴⁴ In the context of military aviation in California and elsewhere, there is no facility that rivals the significance of NAS North Island.

5.1.1 Property Type: Air Corps Hangars

The earliest Air Corps airfields were primitive by comparison with those built after 1919, with temporary hangars and crude, often unpaved runways. Because they are of such temporary construction, very few resources remain from this period. The Air Corps established four airfields in California during this period: Rockwell Field on modern NAS North Island, Mather Field in Sacramento, March Field in Riverside County, and Benton Field in Alameda. The airfields from this era fall into two categories: the earliest airfield, built before World War I (Rockwell Field; see Figure 15); and the World War I aviation training stations. The Air Corps built a permanent base at Rockwell Field, at what is now NAS North Island.⁴⁵

⁴³ The primacy of California in the field of military aviation is generally acknowledged in recognition of the key role of NAS North Island in this area. NAS North Island was recognized as the "Birthplace of Naval Aviation" by act of Congress in 1963. NAS North Island web site, www.nasni.navy.mil.

⁴⁴ The American military's primary air branch has gone by three names over time: Air Corps, Army Air Forces, and Air Force. Until the late 1940s, the branch was part of the Army. Until the start of World War II, it was called the Air Corps, or Army Air Corps, reflecting the fact that it was a corps within the Army. During World War II, it was called the Army Air Forces, again, reflecting its position within the structure of the Army. With the reorganization of military branches in the late 1940s, the Army's air assets were formed into a separate branch, called the Air Force. (The Navy's air assets have remained part of the Navy.) Throughout this document, an attempt is made to refer to these forces by their name at the time under discussion: Air Corps until World War II, Army Air Forces during World War II, and Air Force during the Cold War.

⁴⁵ The Corps of Engineers Research Laboratory (CERL) is working on a nationwide context for hangars as a building type. This document, which will be extremely useful to Navy as well as Air Force personnel, was not complete or available at the time the present report was being prepared.



Figure 15. This double-module hangar at the Army's former Rockwell Field is one of a small group of World War I-era hangars in California. Its significance is in its historical associations, not in its architectural merit. (Source: JRP Historical Consulting Services.)

Examples:

Surprisingly, there are almost no known hangars that have survived from this early period. The only known examples are four World War I-era hangars that still exist at the Rockwell Field part of what is now NAS North Island.

- *Buildings 501, 502, 503, 830 and 833 at NAS North Island*—Listed in the National Register as part of Rockwell Field Historic District. Building 830 was demolished in 1997, following HABS documentation.

Registration Requirements

It is conceivable, but unlikely that other early hangars still exist on active military installations. World War I-era Air Corps hangars appear to be one of the rarest property types associated with the history of the military in California. If any additional examples are identified, on military bases or elsewhere, these should be regarded as having a high potential for eligibility to the National Register. In terms of their integrity, these properties should be evaluated recognizing the fact that only a very small number of such buildings still exist. While it is realistic to expect that a moderate degree of integrity be present, the integrity expectations can be lowered to account for the rarity of the property type.

5.1.2 Property Type: Non-Hangar Buildings and Structures from Early (Air Corps) Airfields

As stated previously, the Air Corps established four airfields in California during this period: Rockwell Field on modern NAS North Island, Mather Field in Sacramento, March Field in Riverside County, and Benton Field in Alameda. Apart from hangars, these early airfields required most of the infrastructure ordinarily associated with a military installation, including housing, mess halls, public works buildings, and so forth. Most of the early airfields were of such impermanent construction, however, that virtually nothing remains from the pre-1919 camps. Of the four, only Rockwell Field, which was a pre-war facility, was built to permanent standards.

As a result, the non-hangar buildings from this period are nearly as rare as the hangars. The only examples are a handful of buildings at Rockwell Field (NAS North Island) and a lone building (Building 413) at March AFB. It should be noted, however, that the Rockwell Field and March Field buildings are fundamentally different. As with all wars, construction during American involvement in World War I was of a lesser quality than pre-war preparedness construction. Rockwell Field was laid out and many of the buildings designed by noted architect Albert Kahn.

Wartime construction at March Field, Mather, and Benton fields, by contrast, was hastily accomplished, using standard site and building plans. Wartime March Field, Mather, and Benton fields were nearly identical in every respect. What remains from pre-war Rockwell Field, then, is of a higher quality design than the lone survivor from wartime March Field. The lone building at March Field does, however, gain significance in terms of its rarity; it appears to be the only remnant of World War I-era temporary construction at an Air Corps facility.

Examples:

- *Building 413, March AFB*—Listed in the National Register as part of March Field Historic District. This is the only building left from the World War I-era base at March Field.
- *Buildings 505 (gatehouse), and T, U, and V (officers' quarters) at Rockwell Field*—Listed in National Register as part of Rockwell Field Historic District. These are the only pre-1919 buildings still standing at Rockwell Field, apart from the hangars, mentioned earlier.

Registration Requirements

It is conceivable, but unlikely that other early non-hangar buildings still exist on active military installations. World War I-era Air Corps buildings appear to be a very rare property type associated with the history of the military in California. If any additional examples are identified, on military bases or elsewhere, these should be regarded as having a high potential for eligibility to the National Register. In terms of their integrity, these properties should be evaluated recognizing the fact that only a very small number of such buildings still exist. While it is realistic to expect that a moderate degree of integrity be present, the integrity expectations can be lowered to account for the rarity of the property type.

5.2 THEME 2: NAVY ADOPTS THE AIRPLANE

The Navy adopted the airplane as quickly as the Army, focusing initially on seaplanes but quickly adopting land-based aircraft as well. The Navy established an air station on North Island at the same time that the Army built its Rockwell Field. In a rare instance of inter-service use of a single installation, the two branches operated airfields at North Island, although each maintained its own hangars, landing fields, and related buildings and structures. NAS North Island was the only NAS from this period, although the installation also used several auxiliary landing fields in the area.

5.2.1 Property Type: Navy Hangars

There are only two known Navy hangars from this period: Buildings 1 and 2, the seaplane hangars at NAS North Island. These were designed by the well-known architect, Bertram Goodhue, and were built in 1918. There are also two seaplane ramps without building numbers, leading from Buildings 1 and 2 to the harbor. Buildings 1 and 2 and the seaplane ramps are identified as contributing elements to the NAS North Island Historic District.

Examples:

- *Buildings 1 and 2, and associated concrete ramps, NAS North Island*—Listed in the National Register as part of the NAS North Island Historic District.

Registration Requirements

It is conceivable, but unlikely that other early hangars still exist on active military installations. These should be regarded as having a high potential for eligibility to the National Register, provided the buildings retain a moderate degree of integrity. See general comments regarding Air Corps hangars from this period (Section 5.1.1). Navy hangars should be treated in the same manner.

5.2.2 Property Type: Non-Hangar Buildings and Structures from Early Navy Airfields

There was only one Navy airfield established in California during this period: NAS North Island. Although it was planned before American involvement in World War I, only a few buildings were constructed before 1919. The NAS North Island historic district, which is listed in the National Register, represents the completion of the pre-1919 plan, although most of the construction occurred during the early 1920s (in the interwar years).

As discussed with respect to Air Corps facilities, the pre-war preparedness construction was built to a high quality, architecturally and structurally. NAS North Island was laid out and most of the buildings, including the two seaplane hangars, were designed by a noted architect, Bertram Goodhue, who designed the Balboa Park exposition buildings and Marine Corps Recruit Depot (MCRD) in San Diego.

Examples:

- There are no known surviving buildings or structures from wartime temporary construction at Navy air facilities.

Registration Requirements

It is conceivable, but unlikely that non-hangar airfield buildings from this period still exist on active military installations in California. Recognizing the paucity of resources associated with this important theme, any property of this sort should be regarded as having a high potential for National Register eligibility, providing that it retains some degree of integrity. It is possible, for example, that there exists a World War I temporary building somewhere in California, perhaps even at NAS North Island or at one of the smaller facilities used as training stations. If such a building were identified, it should be considered seriously for registration, chiefly on the basis of rarity and strength of association with this theme. The building, however, would need to retain the essential character-defining elements of the property type. Some research would be required to establish the original appearance of any building of this sort, which has not been documented to date through inventory efforts in California.

5.3 THEME 3: EXPANSION OF NAVY FACILITIES

The modernization of the Navy, particularly the adoption of radio communication and the submarine, brought with it the need for numerous specialized facilities to accommodate new machines and methods. One of the most important innovations in this regard was the training station, a consolidated school to train personnel in the use of these new technologies. The Navy responded in two ways: establishment of a stand-alone training station, dedicated to this task; and establishment of separate apprenticeship schools on established Navy stations. Other innovations may be observed in the types of ammunition depots and fuel depots built during this era, as well as the submarine repair base, a type of facility that originated during this era.

5.3.1 Property Type: Naval Training Stations

The first, and for several decades the only separate Naval Training Station (NTS) in California was the facility at Yerba Buena Island, which served in this capacity from 1900 through 1922. Figure 16 shows the crowded conditions on the island, circa 1920. After 1922, most of the buildings from the training station were demolished, even though the facility remains in Navy ownership through the present. During the mid-1930s, the State of California built the San Francisco-Oakland Bay Bridge through Yerba Buena Island, but the alignment did not require demolition of many Navy buildings. The larger Navy buildings were demolished after World War II. During World War II, Yerba Buena Island became a kind of residential suburb for the nearby and larger Naval Station, Treasure Island. Thus, only residences remain from the early training station. There are seven Navy officers' quarters at Yerba Buena Island along with a Marine Corps officers' quarters and a separate quarters for a valued civilian employee.

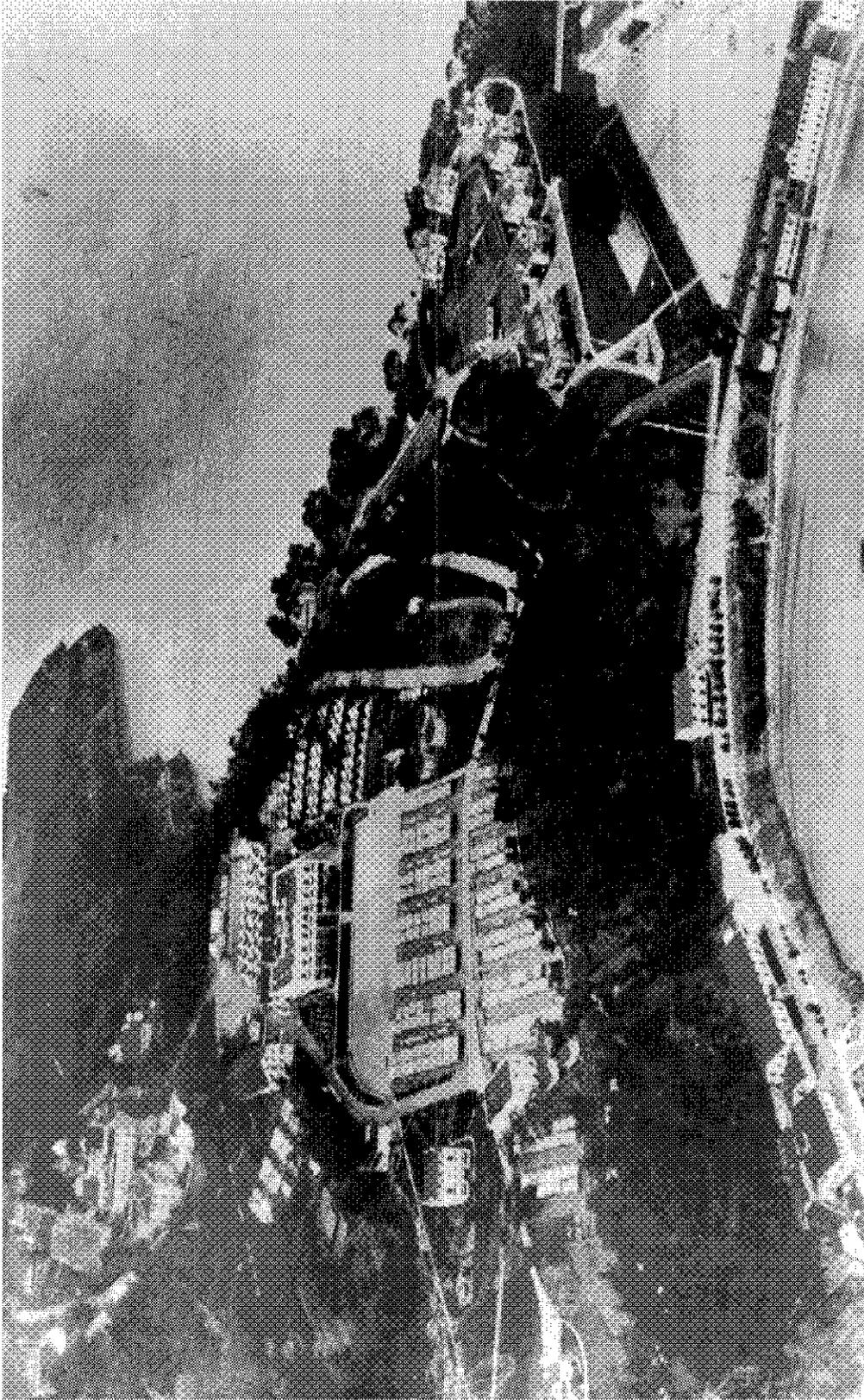


Figure 16. Naval Training Station, Yerba Buena Island, ca. 1920. The functions of this station were moved to San Diego in 1923 because conditions were crowded on the island, as shown in this photograph. (Source: The National Archives.)

Examples:

- *Buildings 1-7 and associated outbuildings at Yerba Buena Island*—Determined eligible for listing in the National Register as the Senior Officers' Quarters Historic District.
- *Quarters 8 and 9, Yerba Buena Island*—Determined eligible for the National Register individually.

Registration Requirements

The residential enclave at Yerba Buena Island does not accurately portray how this station operated. The quarters and related support buildings (garages and gardens), however, are all that remain from this large training station and are eligible for the National Register on that basis. Because this was the only integrated training station in operation during this period, it is unlikely that additional related resources will be identified. Should any such resources be identified, they should be evaluated with the understanding that resources associated with this theme are quite rare. These buildings soon will be transferred from the control of the Navy to local authorities.

5.3.2 Property Type: Training Schools on Established Navy Stations

In addition to the dedicated training station at Yerba Buena Island, the Navy set up apprentice schools and other specialized schools on established Navy stations. This pattern has not been documented in detail. It is known that the Navy built two apprenticeship school buildings at Mare Island during this period. It is highly likely that early 20th century training buildings were also built at other stations and perhaps elsewhere at Mare Island, to train personnel in radios, submarine operations, and other major innovations from this period.

Examples:

- *Buildings 206 and 208 at Mare Island*—Listed in the National Register as part of Mare Island Historic District.
- *Radio school buildings at Mare Island*—Listed in the National Register as part of the Mare Island Historic District.

Registration Requirements

The term “training” is broad and could include a wide range of buildings if not applied rigorously. This theme should be applied only to properties that were dedicated to separate, specific apprenticeship programs on Navy stations. There appear to be few properties that are directly associated with this theme although, as noted, it is likely that other buildings on Navy stations were used for this purpose. Other buildings whose uses changed over time may be listed in the National Register in association with other themes and property types.

5.3.3 Property Type: Navy Supply and Ammunition Depots

Surprisingly, the Navy made do throughout this period of great expansion without a separate supply depot. During the interwar years and particularly during World War II, the Navy established a series of specialized supply depots in the San Diego, Los Angeles, and San Francisco Bay areas, located in most cases at junctures of navigational and railroad networks. During the early 20th century, however, supplies and munitions were stored at the multi-purpose facilities, particularly at Mare Island and at NAS North Island, near San Diego. The Naval Ammunition Depot (NAD) on the south end of Mare Island grew considerably during this period, reflecting its important role in the supply network. The Navy built numerous warehouses at Mare Island during the same years, again reflecting the absence of separate, specialized supply depots.

Examples:

- *Ammunition depot and supply warehouse buildings at Mare Island*—Listed as part of the Mare Island Historic District.
- *Warehouses at NAS North Island*—Listed as part of NAS North Island Historic District.

Registration Requirements

It appears that the supply and munitions buildings at Mare Island and NAS North Island are the only buildings and structures in California that represent this property type. These buildings are listed in the National Register as part of the larger historic districts for those two installations. Other buildings on Navy facilities might be considered part of the supply network during these years; the smaller Navy installations undoubtedly kept some type of storage facilities. In terms of major supply depots, however, the big warehouses at Mare Island appear to have been the primary facility in California during these years, with the warehouses at North Island geared toward supplying itself.

5.3.4 Property Type: Naval Fuel Depots

Previously, the Navy did not have freestanding supply and ammunition depots (depots not connected to a Navy station), but the Navy began to construct a separate fuel depot system during the Modernization Era. Among the most important technological innovations of the early 20th century was the complete conversion of the fleet from sailing ships to coal-fired and then petroleum-based fuel-fired ships. This conversion was underway throughout the late 19th century but the Navy had sailing ships in service until well into the 20th century. In the first decade of the 20th century, the Navy built a separate “coaling station” on Point Loma at the entrance to San Diego Harbor; this was one of the first Navy facilities at Point Loma. The Navy also built a large coal shed operation at the quay at Mare Island.

The conversion from coal to oil came about swiftly during the early 20th century, rendering the “coaling” stations obsolete within a decade of their construction. The conversion was not simply a change in fuel; the oil-fired ships of the 20th century were, like diesel trains, essentially electric crafts with an oil-fired turbine to generate electricity.

Examples:

- *Quarters A from the early 20th century Naval Coaling Station, Point Loma (now Fleet and Industrial Supply Center [FISC], San Diego, Point Loma Annex)*—Determined to qualify for listing in the National Register. No buildings remain, however, from the coal storage operation; the facility was quickly converted to oil storage and is still used in that manner.
- *Coal sheds at Mare Island, built during the first decade of the 20th century*—Listed in the National Register as part of Mare Island Historic District.

Registration Requirements

Very little remains to substantiate the short-lived use of coal by Navy vessels. The coal sheds at Mare Island, while modified, represent the only direct link in this regard. The officer’s quarters at the Point Loma Coaling Station is only indirectly linked to this theme.

It is possible, but unlikely, that additional resources will be found that represent this property type. If so, these should be inventoried and evaluated in the context of the few examples of this property type that have been evaluated to date. That is, given the rarity of this property type, an indirect link to the theme and moderate integrity may be adequate to qualify a property for listing on the National Register.

5.3.5 Property Type: Submarine Bases

Although the concept dates to the Civil War or earlier, the modern submarine is a product of the early 20th century and one of the key accomplishments of this era of modernization. The first submarines to appear at a military base in California were the *Grampus* and *Pike*, which were built in commercial shipyards in San Francisco and delivered to the Navy at Mare Island in 1904.

The submarines arrived at Mare Island around the time the Navy began to encourage its shipyards to compete with private shipbuilders for completion of Navy vessels of all sorts, including submarines. As a result, it is somewhat difficult to isolate specific buildings at Mare Island that are associated directly with this new work on submarines.

The Navy built many new shops along the waterfront at Mare Island during these years, including Building 271, which was important architecturally as well as functionally. Building 271 (shown in Figure 17) was completed in 1918 and appears to have been the first substantial steel-frame, curtain wall industrial building ever built in California. It is certainly the first in a long line of such buildings constructed at Navy shipyards in California. This huge metalworking building was likely responsible for much of the early work on submarines, but was no doubt used to accomplish part of the work on essentially every major vessel that would be built or repaired at Mare Island. Building 680 at Mare Island, was also constructed during this period and was clearly intended for submarine repair work. The building's loft was constructed and equipped specifically for overhauling periscopes.

In time, the Navy built a segregated submarine repair facility at Mare Island, as well as accommodations for the crew of submarines in dry dock there. Between the world wars, the Navy also established submarine basing and repair facilities in southern California, first at San Pedro and later in San Diego.

Examples:

- *Buildings 271 and 680, Mare Island*—Listed in the National Register as part of Mare Island Historic District.

Registration Requirements

While it is clear that the introduction of the submarine was an important development from this period and buildings have been identified that were at least partly associated with this theme, it is less clear that there are specific facilities that relate exclusively to the theme. It is most likely that any such dedicated facility would be located at Mare Island (Building 680, referred to above, may be a case in point), although it is possible that such a facility may exist at the Naval Station, San Diego as well.

In the case of Mare Island, the strength of association and rarity are subject to some debate. Mare Island, for example, is filled with buildings that likely had some role in early submarine and repair work, but the strength of association of any one building is subject to interpretation. Similarly, the rarity of a building of this sort is subject to interpretation. One could argue that there are many such buildings at Mare Island. In any event, the building would need to retain sufficient integrity that it may be interpreted and understood for its role in this important aspect of Navy history.



Figure 17. Building 271 at Mare Island, 1918. The glass-enclosed curtain wall building is at the center. Although it was a thoroughly modern industrial building for its time, it was integrated structurally with 19th century brick buildings. (Source: Historic American Buildings Survey, photographer William Dewey.)

5.4 THEME 4: LARGE-SCALE ARMY TRAINING BASES

With the adoption of motorized vehicles and tanks, the Army quickly began to outgrow the cramped cantonments in the San Francisco Bay Area. In retrospect, it is clear that the modern Army's most important requirement was a spacious training base, the kind of isolated and sprawling facility that would ultimately be provided by Fort Irwin in the Mojave Desert. During the Modernization Era, the Army made do with temporary training locations. During the pre-World War I preparedness campaign, however, the Army was able to acquire substantial acreage in Monterey County, not far from its training base of the Presidio of Monterey. This camp during World War II became Fort Ord. The Army was also able to acquire acreage to build Camp Kearny in interior San Diego County during the Modernization Era. That facility remained in government control after the end of the war; today, it is the site of MCAS Miramar. Although the original Camp Kearney was a very large infantry training base during World War I, it appears that all traces of it have disappeared.

5.4.1 Property Type: Army Training Facilities

Examples:

- *Presidio of Monterey*—Listed in the National Register as an historic district.
- *Camp Kearny (modern MCAS Miramar)*—This facility has been inventoried and evaluated and no World War I-era resources were identified.

Registration Requirements

This appears to be an important historic theme for which there are no extant historic resources. Part of this may be explained by the nature of the activity. There were dozens of Army training facilities in California during World War I, but there are surprisingly few resources associated with that activity. The training areas themselves required little besides open spaces. Only the cantonments required large numbers of buildings. The troops using Camp Ord (later Fort Ord) were stationed at the Presidio of Monterey. The troops at Camp Kearny were stationed there and required hundreds of buildings or a tent city. It appears, however, that all such temporary structures were destroyed between the wars and during the build-up before and during World War II.

5.5 THEME 5: NAVY AND ARMY ADOPT RADIO COMMUNICATION

“Wireless” communication was not proven to be workable until 1896. The American military, particularly the Navy, immediately recognized the incredible potential for this new technology and invested in its development and use in the first decade of its availability. The Navy's goal

was to establish a communication link between its far-flung stations in the Pacific, including Hawaii, the Philippines, and Guam.

5.5.1 Property Type: Early Radio Communication Facilities

The Navy needed two types of facilities: transmitting stations and schools for radio operators. The earliest transmitting station was built at Point Loma in San Diego in 1906; nothing remains from this facility. Only a few years later (in 1914), the Navy built a larger transmitter at Chollas Heights, near La Mesa in San Diego County, to increase the range of the Point Loma station. For many years, the primary West Coast radio school for the Navy was located at Mare Island and many radio school-related buildings and structures still exist there.⁴⁶

Examples:

- *Radio school buildings at Mare Island*—Listed in the National Register as part of the Mare Island Historic District.
- *Chollas Heights Naval Radio Facility*—Inventoried and evaluated; a historic district was found to qualify for the National Register, comprising buildings from 1917 through 1945. The buildings at the facility have since been demolished
- *Naval Radio Station, Point Loma*—Established in 1906, no buildings or structures remain from this early facility.

Registration Requirements

The early radio programs of the Navy have been commemorated through historic properties at Mare Island and Chollas Heights. The Chollas Height buildings were found to qualify for the National Register; these buildings have since been demolished. Surprisingly, it appears that no similar facilities have been identified that were associated with the early radio programs of the Air Corps and the Army. It is highly probable that such facilities existed and it is possible that some types of buildings or structures still remain.

Any new Navy, Army, or Air Corps facilities that reflect this theme should be inventoried in the context of the known Navy resources. The three broad qualities of strength of association, rarity, and integrity should be taken into account.

⁴⁶ During World War I, there were two schools in the United States to train “radiomen” for the Navy: one was at Harvard University in Cambridge, Massachusetts, the other was at Mare Island. Capt. L.S. Howeth, *History of Communications-Electronics in the United States Navy*. Bureau of Ships and Office of Naval History, 1963, 529.

5.6 THEME 6: ATTEMPT TO ESTABLISH AN INDEPENDENT FACILITIES FOR THE MARINE CORPS

5.6.1 Property Type: Major Marine Corps Facilities

The pre-Cold War history of the Marine Corps in California is built around four major properties: Mare Island, NAS North Island, MCRD San Diego, and Camp Pendleton. Before MCRD was established and occupied in the 1920s, the Marines were scattered at various sites, but did have a major station at Mare Island and a minor presence at NAS North Island.

The first attempt to establish a major, semi-autonomous facility for the Marine Corps in California occurred in 1917 at the Naval Shipyard at Mare Island. The Marine Corps had always had a presence at Mare Island and all other substantial Navy stations. A small compound had been set aside for Marines as part of the original 1854 site plan for Mare Island. The 1917 decision to establish a recruit depot and training station, however, represented a fundamental departure and change in mission for the Marines at Mare Island. Marines retained their traditional roles: guarding the facility, especially the ammunition depot; administering the brig (jail); and so forth. The massive new barracks (Building M37), however, could house far more men than were needed for those traditional roles. The building, in many respects, symbolizes the beginning of the independence of the Marine Corps in California (see Figure 18). It served that purpose, however, for a very short period of time. No sooner was it built than Navy and Marine Corps officials began planning for a completely autonomous facility in San Diego – the base that became MCRD. Although only used as the recruit depot for a few years, the massive barracks at Mare Island, along with the huge parade grounds, have considerable significance in the general history of the Marine Corps in California.

Just prior to American involvement in World War I, Colonel Joseph Pendleton assembled a Marine Corps West Coast Expeditionary Force in San Diego. This group, with more than 1,000 enlisted men and officers, first assembled in a tent city, called Camp Howard, on NAS North Island. In time, this force moved to MCRD. MCRD, which was planned and approved during this period, was not completed until the 1920s and is discussed in the context of the Interwar Era (Chapter 6.0). The recruit training function for which the Marine Corps barracks at Mare Island was built was also moved to MCRD in 1923. The big Marine Corps barracks at Mare Island, Building M37, along with related buildings in the Marine Corps area, best exemplify the role of the Marine Corps during this period; it appears that no buildings remain from the Camp Howard encampment.

Examples:

- *Marine Corps barracks (Building M37) at Mare Island*—Listed in the National Register as part of the Mare Island Historic District.

Registration Requirements

It is possible, but not likely, that other Marine Corps-related buildings or structures will be identified on active military installations. Additional research, for example, may link the Marines to standing buildings at NAS North Island. If any remnants of Camp Howard are identified in the future, these should be regarded as having potential for listing in the National Register, based upon their association with the beginnings of Pendleton's Expeditionary Force. A building associated with this property type would need to retain sufficient integrity that it could be recognized for its function.

5.7 THEME 7: EXPANSION OF MILITARY HOSPITALS

The military began the 20th century with two substantial hospitals in California: the large Naval Hospital at Mare Island; and Letterman Hospital at the Presidio of San Francisco. Casualties from the Spanish-American War, Philippine Insurrection, and other overseas actions put a great strain on those facilities. Both hospitals were expanded greatly throughout the early 20th century. In time, the Mare Island hospital would diminish in importance as the Navy built a large new hospital in Balboa Park in San Diego in the 1920s. Letterman, by contrast, would continue to grow into one of the largest and most-respected military medical facilities in the nation.

5.7.1 Property Type: Army Hospital Expansion

The Presidio always had some type of hospital facility. In 1899, however, the Army elected to transform an unused area of the Presidio of San Francisco into the Army's first general hospital.⁴⁷ Although construction began in 1899, the hospital was completed just in time to help with the care for the victims of San Francisco's 1906 earthquake. In addition to the hospital, this construction included housing for officers associated with the hospital's operations.

Examples:

- *Original Letterman Hospital buildings*—Listed with the Presidio of San Francisco NHL.

Registration Requirements

Letterman Hospital prospered from the standpoint of its role in the Army's medical program. That success, however, was achieved at a cost to historic preservation values. While major parts

⁴⁷ This analysis is derived from the National Historic Landmark documentation, 1993.



Figure 18. Building M37 at Mare Island. Although built on a Navy base, this building was the original Marine Corps West Coast recruit depot, a function moved to San Diego in the 1920s. (Source: Historic American Buildings Survey, photographer William Dewey.)

of the turn-of-the-century hospital are in place, their context has been diminished through major post-World War II construction in the area.

5.7.2 Property Type: Navy Hospital Expansion

The brick Naval Hospital at Mare Island, completed in 1869, was destroyed in an 1898 earthquake, but the Navy quickly rebuilt the structure, reusing the old stone foundation. The new hospital was completed in 1900. Although it was completed just prior to this era, it was during the Modernization Era that this facility grew into one of the key military medical institutions in the United States.

The Naval Hospital at Mare Island remained an important part of the Navy's medical program, although its relative importance was diminished through construction of a large naval hospital in Balboa Park, San Diego, in the mid-1920s. Its relative importance continued to decline during World War II, when the Navy built very large hospitals in Oakland, Corona, and at Camp Pendleton. The Mare Island hospital closed altogether long before the shipyard ceased operations. It was last used as a school. Buildings. H1 was joined by numerous additions in the 1920s and 1930s. The retrofit of the old hospital required surprisingly few changes to the buildings; they retain a very high degree of integrity to their appearance before World War II.

Examples:

- *Building H1, Mare Island*—Listed as part of Mare Island NHL and in the National Register as part of Mare Island Historic District.

Registration Requirements

There is no reason to suspect that another major naval hospital from this period exists in California, besides the Naval Hospital at Mare Island. There are, however, examples of smaller station hospitals, or “dispensaries,” which served a strictly local clientele and provided limited services.

5.8 THEME 8: MODERNIZATION OF COASTAL DEFENSES

5.8.1 Property Type: Taft-Era Coastal Defense Batteries

As discussed in the previous section, the Endicott Report of 1885 recommended a fundamental reorganization of the strategy and firepower for coastal defenses in California and elsewhere in the United States. The Endicott Board recommendations, however, were largely ignored everywhere in California except for San Francisco Harbor. At other key locations, particularly Los Angeles and San Diego harbors, no new construction was undertaken in response to the board's recommendations.

A second wave of coastal defense modernization occurred during the first decades of the 20th century. These batteries are commonly called Taft-era improvements, referring to the recommendations of Secretary of War, and later President, William Howard Taft. Taft had been asked by President Theodore Roosevelt to convene a panel of military experts to update the Endicott Board recommendations and to assign priority to coastal defense needs not addressed in 1885.

The Taft-era coastal batteries were essentially the completion of recommendations made two decades earlier by the Endicott Board. The Endicott recommendations had chiefly to do with the types of guns to be used; no batteries in California retain their original guns. The recommendations did, however, also extend to the design of the gun mounts, specifying the use of reinforced concrete, which was still an experimental building material at the time.

Prior to 1905, essentially all coastal defense batteries were concentrated in the San Francisco Bay Area, which in the 19th century was the “crown jewel” harbor of the West Coast. The dominant trend of the 20th century in California, for civilian even more than military development, was the emergent importance of southern California. For civilian development, of course, it was the growth of Los Angeles that fundamentally transformed the economy and society of the state. To the military, however, it was the emergence of San Diego that most affected the balance of power within the state. In both respects, however, southern California gained importance that rivaled and ultimately overtook the importance of the San Francisco Bay Area.

After about 1905, coastal defense batteries were installed at three harbor entrances: the old Marin Headlands-Fort Point entrance to the Golden Gate, the Palos Verde Peninsula entrance to Los Angeles Harbor, and the Point Loma entrance to San Diego Harbor. The latter two coastal positions were occupied early in the 20th century, by Fort MacArthur near Los Angeles and Fort Rosecrans near San Diego. Forts Rosecrans and MacArthur were fitted with substantial cantonment areas to house and care for the troops assigned there.

Examples:

- *Coastal defense batteries at Point Loma*—Determined eligible for listing in the National Register as part of a major discontinuous historic district that comprises all coastal defense batteries associated with Fort Rosecrans.
- *Coastal defense batteries at entrance to San Francisco Bay*—Listed in the National Register as part of Presidio of San Francisco Fort Mason and Forts Baker, Barry and Cronkite National Register nominations.

- *Batteries Osgood-Farley, John Barlow and Saxton at Fort MacArthur, San Pedro*—
Listed in the National Register.

Registration Requirements

As discussed in earlier sections, coastal defense batteries are arguably the most thoroughly inventoried and universally registered property types associated with the military history of California. The earlier batteries, from 1846 through the end of the Philippine Insurrection (i.e., from the Frontier and Traditional eras) appear to exist only on civilian land; no battery from these periods is known to exist on an active military base. Batteries from the Modernization Era exist in great numbers at old Fort Rosecrans on Navy-controlled land at Point Loma and at old Fort MacArthur partly on military land and partly on civilian land (former military land transferred to the Los Angeles Department of Parks and Recreation) near San Pedro.

5.9 THEME 9: MILITARY ARCHITECTURE OF THE MODERNIZATION ERA

Just as the Greek Revival dominated 19th century military design, the early 20th century was characterized by the Colonial Revival.⁴⁸ The Colonial Revival was a fashionable style in civilian design of the early 20th century. Its use by Army and Navy architects during this period may be interpreted in the general “modernization” context of the period.

While it was a modern style in its time, the Colonial Revival incorporated so many elements of neoclassical architecture that it blended well with the older Greek Revival-influenced buildings on the 19th century bases, such as Mare Island, the Presidio of San Francisco, and the Benicia Arsenal. NPS summarized the Army’s interpretation of Colonial Revival: “While termed ‘Colonial Revival,’ some of the sources for the style clearly post-date the Anglo-colonial period and could encompass Georgian, Federal, and even Greek Revival architectural prototypes.” The Colonial Revival, then, was a happy marriage of the modern and traditional and was generally an excellent choice for buildings on the older bases. Entirely new installations, such as the NTS on Yerba Buena Island, could be designed from scratch with nothing but Colonial Revival buildings, while retaining some continuity with older stations like Mare Island.

5.9.1 Property Type: Colonial Revival Officers’ Quarters

As discussed in previous sections, officers’ quarters were typically among the most stylish buildings on any given military base and typically designed in the most popular style of the time. This was the case with both Army and Navy construction during the Modernization Era. The Navy, in particular, adopted the Colonial Revival for most of its new construction, including the

⁴⁸ The National Historic Landmark document for the Presidio of San Francisco offers a detailed and thoughtful interpretation of the meaning of the Colonial Revival for the Army Quartermaster and the Presidio in particular.

senior officers' housing at Mare Island, which had to be rebuilt following an earthquake in 1898, and the new housing at the 1900 NTS on Yerba Buena Island. The results were impressive, particularly at Mare Island. The row of early 20th century senior officers' housing there, commonly called the "Big Whites," stands as one of the most handsome group of military family housing units ever built in California. The collection of quarters on Yerba Buena Island was built at about the same time and resembles the Mare Island houses in many respects. An example of Colonial Revival Officers' Quarters at Yerba Buena Island, the Nimitz House, is shown in Figure 19.

Examples:

- *Captains' Row (a row of early 20th century Colonial Revival senior officers' quarters) at Mare Island*—Listed in the National Register as part of Mare Island Historic District.
- *Quarters 1-7 on Yerba Buena Island (a.k.a. "Big Whites")*—Determined eligible as part of Senior Officers' Quarters Historic District.
- *Buildings 1000-1014, officers' quarters at Letterman Hospital*—Listed in the National Register as part of the Presidio of San Francisco.
- *Buildings 124-126, family housing at the Presidio of San Francisco*—Listed in the National Register.
- *Senior officers' quarters at the Presidio of Monterey*—Listed in the National Register as part of a historic district.
- *Double officers' quarters (duplexes) at Fort Rosecrans (now on Naval Submarine Base, Point Loma)*—Determined eligible for listing in the National Register.

Registration Requirements

The Colonial Revival home, particularly officers' quarters, appears to be a reasonably common property type on military installations in California, although most of these homes have passed or will shortly pass out of military ownership. It is reasonable to expect that eligible properties under this theme and property type would possess two qualities: architectural significance and integrity. Given the large number of properties that represent this theme and property type, the standards of significance and integrity should be set fairly high.

5.9.2 Property Types: Colonial Revival Barracks and Non-Residential Buildings

Although best reflected in residential construction, particularly officers' quarters, the Colonial Revival was used in other building types as well. This was true at the Navy shipyard at Mare Island as well as the Army post in San Francisco. It is an interesting question how the Navy and



Figure 19. Nimitz House, Naval Training Station, Yerba Buena Island. The building is so named because Admiral Chester Nimitz lived his last years at this building. The officers' quarters are all that remain from a very substantial Naval Training Station on Yerba Buena Island. (See Figure 16 for a view of the station when it was fully occupied.) (Source: HABS program for San Francisco-Oakland Bay Bridge, Hansen-Murikama-Eshima.)

Army coordinated their design strategies; the two design branches adopted parallel styles from the mid-19th century through the start of World War II.

The Colonial Revival was adapted for very large and prominent buildings at both bases, including the hospital at Mare Island and various public buildings at the Presidio of San Francisco. Arguably, the Colonial Revival was also adopted for buildings at the Presidio of Monterey, which was established during this period. The Colonial Revival tradition is clearly evident in the officers' club, the post exchange, and other public buildings at this base (see Figure 20, for example). The dominant buildings at the post, however, are the many barracks with double verandas. The military, particularly the Army, has a long tradition of building long porches at the edges of barracks. The double veranda style used at the Presidio of Monterey, however, appears to be unique within the context of California. The origin of this building type has not been identified.

Examples:

- *Building H1, the Naval Hospital at Mare Island*—Listed in the National Register.
- *Pershing Hall and Gymnasium at the Presidio of San Francisco*—Listed in the National Register.
- *Various buildings at the Presidio of Monterey*—Listed in the National Register as a historic district.
- *Barracks, library, hospital, other buildings at Fort Rosecrans (now on Naval Submarine Base, Point Loma)*—Determined eligible for listing in the National Register.

Registration Requirements

Non-residential buildings are arguably the most impressive expression of the Colonial Revival style. The collection of buildings at the Presidio of Monterey represents the only known examples that are still under the control of DoD. Other examples may be found on some of the lesser installations from this period, although the likelihood is not great. Any new DoD-owned properties of this sort should be evaluated for their strength of association with this theme, which in this instance refers to the quality of design as an expression of the Colonial Revival style. The properties are only rare in the context of buildings owned by the military; there are a good number of such buildings on BRAC-closed bases, including Mare Island, Treasure Island (Yerba Buena), and the Presidio of San Francisco.



Figure 20. NCO Club, Building 221, Presidio of Monterey. This remarkably unaltered building was the most elegant building at the Presidio of Monterey, an Army training station built in the early 20th century to receive soldiers returning from hard duty in the Philippines. (Source: JRP Historical Consulting Services.)

6.0 INTERWAR-ERA PROPERTIES, 1919-1938

This period begins at the end of World War I and ends with American preparations for entry into World War II. During the 1920s and 1930s, the Army, Navy, Marine Corps, and the predecessors of the Air Force (the Army Air Corps and Army Air Forces) expanded in California in two ways. First, they expanded geographically, building new installations in areas of the state previously unaffected by the military. To a very large degree, this expansion occurred in southern California, particularly in the San Diego area. Second, the various branches built entirely new types of bases, designed to take advantage of new or emerging technologies and strategies. The two expansions were related in that the new installations had different physical requirements than traditional bases in the San Francisco Bay Area, requirements that were best met outside the heavily urbanized Bay Area.

The all-new bases could also be designed from scratch, unencumbered by previous base design concepts. The military bases from this period reflect a renewed and expanded interest in what was sometimes called the “total base design,” referring to a careful integration of site planning, architectural program, and landscape architecture in the design of these new bases. The military had always paid careful attention to site planning, owing to a large degree to the fact that community functions (housing, administration, recreation, and other facilities for use by personnel) had to be built in the vicinity of the often dangerous mission-related functions of the base, such as munitions magazines, runways, and shipyards. For practical reasons, military site planners had adopted “zoning” for its base design long before the concept had taken hold in civilian city planning. During the 1920s and 1930s, however, city planning concepts, which were gaining great popularity among civilian architects and planners, began to influence military planners as well. Never before or since has the concept of “total base design” so profoundly influenced military facilities, particularly those in California.

6.1 THEME 1: NAVY EXPANDS TO SAN DIEGO

Arguably, no city in California has been so affected by military activities as the City of San Diego, which became a “Navy town” during these years. As noted, the general trend in military construction was from north to south, from the densely settled San Francisco Bay Area to southern California. Nowhere was this trend more pronounced than the move of the Navy to San Diego. Before the turn of the century, essentially all assets of the Navy in California were concentrated in the general San Francisco Bay Area. By the start of World War II, San Diego had become the center of power for the Navy on the West Coast, a position that it largely retains today.

The decision in favor of San Diego was not all made at once; given its preference, the Navy would have built a single, huge naval station somewhere in San Francisco Bay. Unable to finance that great station, however, the Navy turned instead to a series of small improvements – a training station here, a repair facility there, and so forth, one smaller installation at a time. Nearly all small facilities from this period were built in San Diego. In time, the concentration of assets began to build on itself. The presence of the huge NAS North Island, for example, made San Diego an obvious port for aircraft carriers. The presence of a radio station at Point Loma made interior San Diego an obvious candidate for a larger inland transmission facility. The presence of these many Navy stations made San Diego a prime candidate for a new naval hospital.

6.1.1 Property Type: Navy Facilities in San Diego

Various Navy facilities in San Diego were initially established during the Interwar Era. Not all of these, however, include important historic buildings and structures from this period. Naval Station, San Diego, for example, was established in 1921, but very few buildings or structures remain from this period. Fortunately, there exist three stations that include substantial remains from the Interwar Era: NAS North Island; the Naval Training Center (NTC) San Diego; and Naval Hospital, Balboa Park. Apart from these major stations, there exist some remnants of other, smaller Navy facilities scattered throughout the San Diego area, including the Coaling Station on Point Loma and the Broadway Complex Supply Depot.

Examples:

- *NAS North Island*—Listed in the National Register as an historic district. Although construction began before 1917, this facility was completed during the 1920s.
- *NTC San Diego*—Determined eligible for listing in the National Register as an historic district.
- *Naval Station, San Diego*—Some buildings determined eligible for the National Register but none from the interwar years.
- *Naval Hospital, Balboa Park, San Diego*—Listed in the National Register as an historic district.
- *Naval Radio Transmitting Station, Chollas Heights*—Determined to be eligible for listing in the National Register. The buildings at this station have since been destroyed.
- *Naval Coaling Station, Point Loma (now FISC, San Diego, Point Loma Annex)*—One building (a residence) has been found to meet the criteria for listing in the National Register.

- *Naval District 11 Command and “Broadway Complex” (now FISC, San Diego)*—Determined eligible for listing in the National Register. The buildings in this complex were begun during the 1920s, but expanded during the years leading up to American involvement in World War II. Architecturally, they better reflect the latter period.

Registration Requirements

This theme has been commemorated to a substantial degree by the large historic districts at NAS North Island, the Naval Hospital in Balboa Park, and NTC San Diego. These quality historic districts, which retain a high degree of integrity, establish a high threshold against which other Navy stations in San Diego may be compared. Other Navy facilities in San Diego have been found to qualify for listing in the National Register, but in relation to other themes.

In general, it may be observed that this is a very important theme in the history of the military in California, but not a theme that, in and of itself, would qualify a property for listing in the National Register. In a sense, the theme is too large to constitute the basis for significance; there are so many properties associated with it that the associational value is trivialized. This is not to say that there are not Navy properties in San Diego that qualify for the National Register; indeed, hundreds of such properties have been listed in or determined eligible for listing in the National Register. Most of these, however, have been found to qualify on the basis of specific contributions to the growth of the Navy in the area, such as the first radio school, or the first naval air station. On balance, it appears that these sub-themes adequately convey the general significance of the Navy to this city.

6.2 THEME 2: NAVY EXPANDS ITS AVIATION PROGRAM

Although the seeds had been planted in the years before World War I, Navy aviation grew to maturity in the interwar years. Construction of NAS North Island was initiated prior to American involvement in World War I, but was not completed until the 1920s. Later in this period, the Navy built a second aviation facility, NAS Sunnyvale, which was home to a cavernous dirigible hangar, crew, and aircraft.

6.2.1 Property Type: Naval Air Stations

The Navy built up two substantial naval air stations during the interwar years: the older NAS North Island, started prior to World War I in San Diego, and NAS Moffett Field in Sunnyvale, near the southern end of San Francisco Bay. The two, however, were different facilities. NAS North Island was the primary conventional aircraft training station. NAS Sunnyvale was a dirigible air station. It was later re-named Moffett Field for Admiral William Moffett. Moffett, a champion of Navy aviation, promoted the idea that slow-moving dirigibles could be used for

coastal patrol and could even be armed with bombs or fitted with facilities to launch and recover small airplanes.

Although the Sunnyvale facility is of interest for the existence of the large dirigible and blimp hangars there, NAS North Island developed into a station of national importance to the Navy's aviation program. Arguably, the key contribution of NAS North Island during this period was its role in the training of pilots for aircraft carrier duty. While the permanent buildings at NAS North Island were still under construction throughout the 1920s, the *USS Langley* was assigned to the station as Aircraft Carrier Number One. The *Langley* had been built as a collier (coal-carrier) at Mare Island in 1912. After World War I, it was fitted with a flat-top or "flying deck" and was assigned to North Island as a training craft for the experimental science of shipboard take off and landing. Although it would retain its original seaplane squadrons throughout the Interwar Era, it was in the training of aircraft carrier pilots that the station would make contributions of national importance.

It will be recalled that North Island was also home to the Army Air Corps' Rockwell Field for most of this period. The Army Corps left North Island in 1935 through a complicated transfer of facilities with the Navy. In exchange for Rockwell Field, the Navy gave NAS Sunnyvale to the Army. The base in Sunnyvale remained an Army station between 1936 and 1940, before it was transferred back to the Navy. The importance of North Island to naval aviation only increased after 1936, when it became a very large base, inheriting not only the runways and hangars, but also the supply and repair depots of the old Army Air Corps station. Figure 21 shows an aerial view of NAS North Island, from 1925.

Examples:

- *NAS North Island*—Listed in National Register as an historic district.
- *NAS Moffett Field (built as NAS Sunnyvale)*—Listed in the National Register as NAS Sunnyvale Historic District (no longer a Navy property).

Registration Requirements

Buildings and structures from the two major interwar naval air stations in California have been listed in the National Register as historic districts. The two, however, have little in common. NAS North Island, as discussed below, has gained considerable recognition for the fact that the site was planned and many of the buildings designed by Bertram Goodhue, one of America's best-known architects of the early 20th century. It is equally important (some would argue far more important) as the birthplace of Navy aviation, as discussed in an earlier section. The old



Figure 21. 1925 view of North Island, when it was still an island. Through inflill of the Spanish Bight between North Island and Coronado, the two areas are now contiguous. The Air Corps' Rockwell Field is in the center of the photograph, while the Navy's Naval Air Station is in the distance, curving along San Diego Bay. (Source: the National Archives.)

NAS Sunnyvale (or Moffett Field) was a blimp station and is dominated by massive lighter-than-air hangars; one is from the 1930s, the others from World War II. The only quality the two share is the fact that the residential and administrative buildings are in the Mission Revival or Spanish Colonial Revival style, a quality that is treated in Theme 10 below.

These stations are significant as the only naval air stations to operate in California during this period. There were no other stations at the time; it is therefore unlikely that any other properties will be inventoried and evaluated under this theme. Since properties these stations have already been evaluated and listed on the National Register, no additional registration requirements are provided here.

6.2.2 Property Type: Outlying Naval Fields

Both the Navy and Army Air Corps developed small outlying facilities that could be used as emergency landing fields and as support for specialized training assignments. NAS North Island crews were able to land at three outlying fields: Ream, Border, and Otay.⁴⁹ Emergency landings could also be made on San Clemente Island, beginning a long relationship between NAS North Island and San Clemente Island. San Nicolas Island, now associated with NAWS Point Mugu, was also used for emergency landings and training exercises.

Late during the Interwar Era, the Navy established Reeves Field on Terminal Island, near the ports of Long Beach and Los Angeles. It was called Naval Air Facility Reeves Field and was located on land leased from the City of Los Angeles. The field did not grow into a major air station. It was important, however, as the beginning of a long association between the Navy and Long Beach, one that was only recently severed through the closure of Naval Station, Long Beach.

Examples:

- *Brown Field, San Diego*—This property was inventoried and evaluated; only World War II-era resources were found to qualify for the National Register.
- *Reeves Field, Long Beach*—Inventoried and evaluated; no properties associated with the field were found to qualify for listing in the National Register.
- *San Nicolas Island, near San Diego*—The island was thoroughly inventoried and no Interwar-era resources were located.

⁴⁹ These are mentioned in Naval Air Station, *Jackrabbits to Jets: The History of Naval Air Station North Island, San Diego, California*. 1992. The Otay field would become Brown Field. Border Field was on the coast near the Mexican border. The location of Ream Field has not been identified.

Registration Requirements

The military still controls some of the sites for these outlying fields, but it is unlikely Interwar-era resources still exist there, owing to the very temporary nature of construction during this era and the auxiliary status of these sites. If an Interwar-era property is identified in the future, it should be given serious consideration for National Register eligibility, recognizing that no other resources of this type have been identified to date.

6.3 THEME 3: ARMY AIR CORPS EXPANDS ITS AVIATION PROGRAM

During the interwar years, the Army Air Corps (predecessor to the Air Force) expanded its programs in California at a rate that rivaled that of the Navy. At the end of World War I, the Army had control over the permanent facility at Rockwell Field (North Island) and rather flimsy wartime temporary facilities at Mather Field in Sacramento, March Field near Riverside, and Benton Field on Alameda Island.

The Army Air Corps spent the interwar period building up three large facilities: March Field, which was entirely rebuilt on the site of the World War I base; Hamilton Field in Marin County; and Crissy Field at the edge of the Presidio of San Francisco. The Army also had temporary control over NAS Sunnyvale, which the Army acquired from the Navy in exchange for Rockwell Field on North Island. Rockwell Field was transferred to the Navy in the mid-1930s.

6.3.1 Property Type: Major New Army Air Corps Facilities

The Army's expansion of airfields during this period parallels to some degree the expansion of Navy facilities during this period, in that the Army Air Corps invited local communities to donate land and offer other inducements to military construction in the area. The community of Riverside lobbied heavily to have March Field built up to a permanent standard. Marin County donated the land for Hamilton Field. Crissy Field was built on landfill left from the World's Fair in San Francisco and was a short-lived facility; it opened in 1921 and closed in 1936, because of flight path interference with the Golden Gate Bridge. March Field and Hamilton Field were major facilities, serving chiefly as bomber bases. Crissy Field was home to a mix of various uses, most having to do with aerial surveillance.

Examples:

- *March Field near Riverside*—Listed in National Register as an historic district.
- *Hamilton Field, Marin County*—Listed in National Register as an historic district. Recent studies have suggested de-listing the district, owing to recent demolition of buildings there.

- *Crissy Field, Presidio of San Francisco*—Listed in National Register as part of the Presidio of San Francisco Historic District.

Registration Requirements

The major Army Air Corps bases of this period have been listed in the National Register. March Field buildings and structures have been listed as an historic district, as have the buildings and structures of Hamilton Field. Crissy Field was a relatively small facility attached to the Presidio of San Francisco and the buildings and structures there have been listed along with the hundreds of other buildings that comprise the Presidio of San Francisco NHL. It is unlikely any other Army Air Corps facilities from this period will be identified.

6.3.2 Property Type: Outlying Army Air Corps Fields

The Army Air Corps, like the Navy, developed a few small, outlying landing fields to serve as emergency airfields and support specialized training. Like the Navy's outlying fields, the Army Air Corps outer fields were probably fitted with temporary buildings. The Navy and Army Air Corps sometimes used the outlying fields cooperatively.

Examples:

- *Muroc Gunnery Range, established in the mid-1930s*—Would become Muroc AFB during World War II and Edwards AFB during the Cold War. No 1930s properties have been found to qualify for listing in the National Register.
- *Outlying Landing Field, Imperial Beach (began as an Army Air Corps facility, later transferred to the Navy)*—Inventoried; no properties found to qualify for the National Register.

Registration Requirements

The locations of the outlying Army Air Corps fields have not been documented conclusively, leaving open the possibility that some outlying fields may have existed on land now controlled by DoD. However, it is unlikely Interwar-era resources still exist there, owing to the very temporary nature of construction during this era and the auxiliary status of these sites. If an Interwar-era property is identified in the future, it should be given serious consideration for National Register eligibility, recognizing that no other resources of this type have been identified to date.

6.4 THEME 4: MARINE CORPS ESTABLISHES INDEPENDENT BASES

Until the end of World War I, the Marine Corps had no independent bases, in California or elsewhere in the United States. As discussed in an earlier chapter, the Navy and Marine Corps decided in the years just before American involvement in World War I to establish a large

Marine compound at Mare Island, to serve as a major training and induction facility, much in the manner of what is now called a “recruit depot.”

The major Marine Corps barracks at Mare Island Naval Shipyard were completed in 1917. Hardly a year later, the Marine Corps began serious consideration of building a new, autonomous facility in San Diego. The new facility, first occupied in 1921, was called the Marine Base, San Diego until the late 1940s, when it received its current title, MCRD San Diego.

MCRD was not originally planned as a replacement of the recruit depot at Mare Island. The Marine Corps had initially established the Fourth Regiment of Marines in 1911 to have in place a fighting force to deal with trans-border problems associated with the long Mexican Revolution. The regiment, commanded by Major-Colonel Joseph Pendleton, resided in various temporary camps in San Diego: North Island, Balboa Park, and elsewhere. The San Diego facility that became MCRD was envisioned as a home for this regiment; only during the Cold War did it become exclusively a recruit depot.

6.4.1 Property Type: Independent Marine Corps Facilities

MCRD was planned and partially built before World War I. Occupation and use of the site, however, did not occur until 1921. During the course of planning for this home of the Fourth Regiment, the Navy and Marine Corps decided to move the recruit depot function there as well. The transfer occurred in 1923. In time, the recruit training function crowded out the expeditionary force. During the interwar years, however, MCRD operated somewhat like Camp Pendleton today, as a training facility for active Marine forces. More and more units were assigned to the base; it was quite overcrowded by the end of this era. That overcrowding was eased only with creation of the great Camp Pendleton during World War II.

Examples:

- *MCRD, San Diego*—Listed in the National Register as an historic district.

Registration Requirements

MCRD in San Diego appears throughout this chapter as a significant example of many different themes. MCRD is quite significant historically as well as architecturally. Its historical importance is best measured by its role in the development of the Marine Corps in California and in the nation. At the time it was built, MCRD was only the second independent Marine base in the United States; the first was located in Quantico, Virginia. It was also a major contributor to the development of San Diego as a “Navy town.” (The Marines and Navy have always shared facilities as well as funding.) Architecturally, it stands as one of the finest collections of military

buildings in the United States (see Figure 22). The importance of the facility in this regard is discussed under Theme 10 (“Military Architecture of the Interwar Era”).

MCRD is an active base, but the Marines have taken great care in making it a showcase facility for the branch. The historic preservation program at MCRD more closely resembles that of NPS than programs at most military bases. Barring a major change in philosophy by the Marine Corps, MCRD, one of the most significant bases in the United States, will be one of the best preserved historic bases as well. Since MCRD is the only example of this property type and since it is already listed on the National Register, no additional registration requirements are provided here.

6.5 THEME 5: THE NAVY AND ARMY ESTABLISH SUPPLY DEPOT NETWORKS

Until the interwar years, neither the Army nor the Navy had separate supply depots in California; i.e., independent depots located off established military bases. In a sense, the Army had a separate facility in its Benicia Arsenal, which had been in operation since the 1850s. The arsenal, however, had evolved into an ammunition depot, as opposed to a combined Quartermaster Depot and arsenal. The Navy for its part made do with supply warehousing capabilities on its major stations, particularly a very large warehouse section on Mare Island. The Army’s Fort Mason in San Francisco had doubled as a supply depot and coastal defense battery since the time of the Spanish-American War. During the interwar years, both branches began to move toward a separate supply depot system, a trend that would be greatly accelerated during World War II.

6.5.1 Property Type: Navy Supply Depots

In 1922, the Navy established its first independent (i.e., not part of a Navy station) California supply depot in San Diego. The facility was located at the foot of Broadway, on the edge of downtown San Diego and was called the “Broadway Complex.” This remained the only Navy supply depot in California through the late 1930s, although it would be joined by numerous other facilities during the 1940s.

Examples:

- “*Broadway Complex*” in San Diego (part of FISC, San Diego)—Listed in the National Register as an historic district.

Registration Requirements

The “Broadway Complex” was the only Navy supply depot built before World War II; all other Navy supply depots were built during World War II or later. As discussed in the World War II chapter, several of the World War II-era depots have been found to qualify for listing in the National Register. The “Broadway Complex,” however, was the first, and for two decades the only Navy supply depot in the state. For that reason, it is the only example of this property type; it appears that no other example will be found on DoD property or other land in California. Therefore, registration requirements are unnecessary for this property type.

6.5.2 Property Type: Army Supply Depots

During most of the Interwar Era, the Army, like the Navy, had little independent supply depot capabilities. During the interwar years, however, the Army began to transform Fort Mason into a major supply depot and shipping point, calling it the San Francisco Point of Embarkation. Fort Mason is one of the most interesting and unusual of the abandoned military bases in California. Like the Benicia Arsenal, it has been closed for several decades; both closed in the 1960s.

Fort Mason occupies land used by the Spanish and Mexican armies for a coastal battery and was claimed by the Army, which claimed all land used for military purposes by the Spanish-Mexican armies. The Army did not use the land, however, in the 1850s. In the meantime, various squatters, including Lt. Col. John C. Fremont, moved there. (Fremont was not in the Army during the years between the Mexican War and the Civil War.) During the Civil War, the Army took possession of Fort Mason and built coastal batteries and various barracks and officers’ housing there. The Army destroyed Fremont’s house but kept several others for use as officers’ quarters. Fort Mason was used as a coastal defense battery until the interwar period, at which time it was reconstructed as a major supply depot. Its finest hour was World War II, when it served as the principal Point of Embarkation for men and material headed to the Pacific.

As indicated above, the transformation of Fort Mason from a coastal battery to a supply depot actually began during the Spanish-American War. The bulk of the supply depot-type resources, however, date to the Interwar and World War II eras. When Fort Mason closed, it was taken over by NPS as part of the Golden Gate National Recreation Area.

Examples:

- *Fort Mason, Port of Embarkation, San Francisco*—Listed in the National Register.

Registration Requirements

The post-closure experience at Fort Mason is instructional in how military buildings can be reused after a base has closed. NPS has transformed Fort Mason into a cultural mainstay

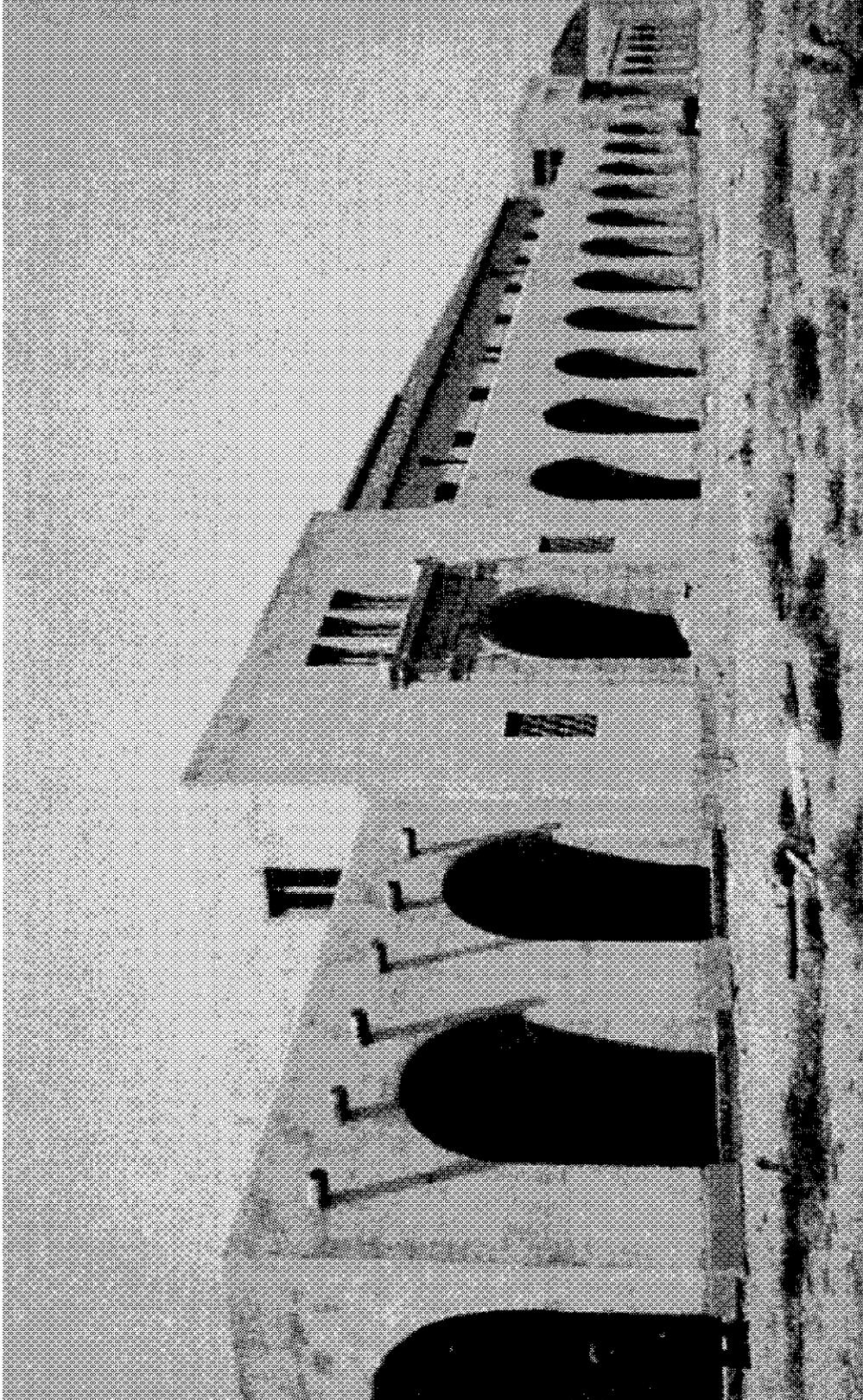


Figure 22. The arcade at the Marine Corps Recruit Depot (MCRD), San Diego, 1925. In addition to its importance as the first West Coast Marine Corps base, the MCRD also introduced the Mission/Spanish Colonial Revival style to military architecture. (Source: The National Archives.)

while preserving the historic integrity of the various buildings and the former post generally. Granted, NPS was in an enviable position in planning this reuse. NPS employs more historians and historic architects than any other Federal agency and collectively had the experience to implement the reuse plan in a historically sensitive manner. The fort buildings are also favorably sited adjacent to San Francisco's Fisherman Wharf at the edge of San Francisco Bay. Still, the experience at Fort Mason offers hope to any city or agency that inherits a closed military base with historic buildings. NPS began with the concept that the historic buildings were an asset rather than a liability, and built a reuse strategy around capitalizing on the character of those buildings. The success of this program demonstrates that former military buildings can be preserved and given important civilian functions, without major diminution of their historic integrity.

6.6 THEME 6: DEEP WATER HARBORS FOR LARGE NAVY SHIPS

Twin themes characterize the history of the Navy during this period: the gradual diminution of the importance of the 19th century station at Mare Island, coupled with the emergence of southern California stations as the center of power for the Navy. The reason for this shift, particularly to San Diego, is discussed under Theme 1 above. The City of San Diego was particularly successful in attracting Navy development there, at least in part through its generosity in giving coastal land to the Navy.

The declining importance of Mare Island, however, may be attributed to natural factors as well. The shallow channel leading to Mare Island, which had worked so well for sailing vessels, was quite inadequate for ever-larger capital ships. This fact caused the Navy to look elsewhere for a facility in which its largest ships could be docked and repaired, a search that led to creation of what is now Naval Station, San Diego, as well as the now-closed Naval Station and Naval Shipyards in Long Beach.

6.6.1 Property Type: Ship Repair Facilities Outside Mare Island

As noted elsewhere, the Navy moved to San Diego one station at a time. Of the various moves, none proved to be more important than the decision to build a small repair and docking facility in San Diego harbor on the San Diego-National City line. The establishment of this facility, which would later be called Naval Station, San Diego, gave the Navy a major facility where ships could be docked and repaired, crews housed and trained, and battle squadrons assembled. This facility, more than any other, served to make San Diego one of the three centers of Navy activity on the West Coast, along with San Francisco Bay (including Mare Island), and the Puget Sound (including Bremerton). As discussed below, the establishment of the Naval Station was linked to creation of the Eleventh Naval District, headquartered in San Diego.

Although formally identified as a repair base, the station in southern San Diego rapidly evolved into a multiple-purpose facility. Even before the repair facilities (dry docks, shops, and so forth) were completed, it was designated a “Receiving Ship” station, or facility for crew awaiting reassignment. This function required construction of barracks, mess halls, a prison, and other buildings needed to accommodate thousands of people stationed there, however temporarily.

The Navy acquired the land for the Naval Station in 1919, but leased it to the U.S. Shipping Board Emergency Fleet Corporation to build concrete ships. Navy interest in concrete ships was short-lived, but intense during World War I. One building, Building 7, remains from that era. Thus, while the facility itself was a product of the interwar period, the bulk of construction at the Naval Station, San Diego dates to World War II or later.

During the interwar years, the Navy also began to use facilities at the Port of Long Beach to harbor its fleet. For this purpose, the Navy acquired or leased facilities at Terminal Island and built a breakwater to shelter the ships. It was not until the build-up leading to World War II, however, that the Navy invested in the Long Beach-San Pedro facility as a permanent Navy base; that base is discussed in the context of World War II.

Examples:

- *Building 7 at the Naval Station, San Diego Historic District*—Determined eligible for the National Register. All other eligible properties there date to World War II.

Registration Requirements

The general movement of the Navy to southern California is discussed in Theme 1 of this chapter (Section 6.1). The establishment of Naval Station, San Diego and the now-closed Naval Station in Long Beach represented key steps in that direction. Although this is a highly significant development, it is not a theme that has resulted in any properties being determined eligible for the National Register, except for one pre-Navy building at Naval Station, San Diego.

6.6.2 Property Type: Navy District Headquarters Outside San Francisco

The Navy had some type of presence in San Diego as early as 1904, when the Coaling Station was established on Point Loma. The real emergence of San Diego as the primary home of the Navy in California, however, may be attributed to the establishment of the NAS at North Island just prior to American involvement in World War I and the Naval Station, San Diego in the early 1920s. With these two key stations in place, the way was paved for the legitimization of that major presence—the creation of a separate Naval District just for the San Diego facilities and the ships, planes, submarines, and thousands of people that were stationed there. The Eleventh

Naval District was established in 1921, with command over all of the Navy facilities in the San Diego area. For a short time, the command was located in the Headquarters building at NAS North Island. In 1922, however, it was relocated to one of the buildings at the “Broadway Complex,” a supply depot at the foot of Broadway, at the edge of downtown San Diego.

Examples:

- *Headquarters Building, NAS North Island*—Listed in the National Register as part of the NAS North Island Historic District.
- *“Broadway Complex,” FISC San Diego*—Listed in the National Register.

Registration Requirements

Any one of the separate Navy stations in San Diego employed more personnel than did the Naval District. Creation of the Eleventh Naval District, however, is important symbolically as well as functionally. Functionally, it established the general command structure for the broad expansion of the Navy in the area during the 1920s and 1930s. Symbolically, it was the best indication that San Diego had arrived as a Navy town.

6.7 THEME 7: ARMY EXPANDS INFANTRY AND CAVALRY TRAINING FACILITIES

As noted in an earlier section, the Army in the early 20th century recognized the need for larger areas to train its troops in new strategies and technologies. Among the key elements of that training was the use of the tank, a vehicle that was effectively introduced during World War I. The Army also needed large, open spaces for infantry training and traditional horse cavalry training; the last mounted cavalry units were disbanded only a few years before the attack on Pearl Harbor.

6.7.1 Property Type: Army Infantry and Cavalry Training Bases

Although the Army had sought control over large training bases since the turn of the century, it did not gain control of vast training sites until the late 1930s, when it became clear that America would enter the global conflict. Before 1939, the only large infantry and cavalry training base available to the Army was the Monterey County facility that would be called Fort Ord during World War II (see Figure 23).

Examples:

- *Fort Ord, Monterey County*—Inventoried, numerous Interwar and World War II-era properties found eligible for listing in the National Register.

Registration Requirements

The land that became Fort Ord has been inventoried and evaluated and there are no buildings or structures at the site that date to the interwar period. The reason for this is simple: it was an open space training base, used by men who lived at the Presidio of Monterey. The open land was selected and used specifically because it did not include any buildings or structures. It appears that no buildings or structures were constructed there during the interwar years and it is highly unlikely that any will be discovered during future inventory efforts. Therefore, no registration requirements are provided here.

6.8 THEME 8: EXPANSION OF HOSPITAL FACILITIES

As noted in an earlier section, the Army and Navy began to expand their California medical facilities at the turn of the century, largely in response to casualties resulting from the Spanish-American War, the Philippine insurrection, and related military actions. As a result, two great military hospitals existed at the close of World War I, the Naval Hospital at Mare Island and Letterman Hospital at the Presidio of San Francisco.

The large number of casualties from World War I overtaxed military hospitals throughout the United States. Both Letterman and Mare Island Hospitals were expanded during and just after the war to handle the long-term care for thousands of the wounded. Faced with this continuing responsibility, the two branches had two choices: continue to expand at their original sites or build new facilities. The Army elected to expand at Letterman, while the Navy elected to build an entirely new medical facility in San Diego.

6.8.1 Property Type: Navy Hospitals

At the end of World War I, the Navy had but one hospital in California; the large but overcrowded facility at Mare Island. The Navy decided in 1919 to build a second hospital in San Diego, at about the time that a host of other Navy facilities were being planned or built in that area. The decision to build a hospital in San Diego was logical; it would serve the staff of the NAS, Naval Station, coaling station, radio station, MCRD, and other Navy or Marine Corps facilities in the area. The decision to build that hospital in Balboa Park, the city's largest and most elegant public recreation area, was somewhat less logical.

Both the Navy and Marine Corps had camped in Balboa Park while the various San Diego stations were still under construction. The Navy's Medical Corps maintained a large (800-bed) tent hospital in the park during World War I. The Navy specifically asked the City of San Diego for title to about 17 acres in Balboa Park for use as a permanent hospital. City officials

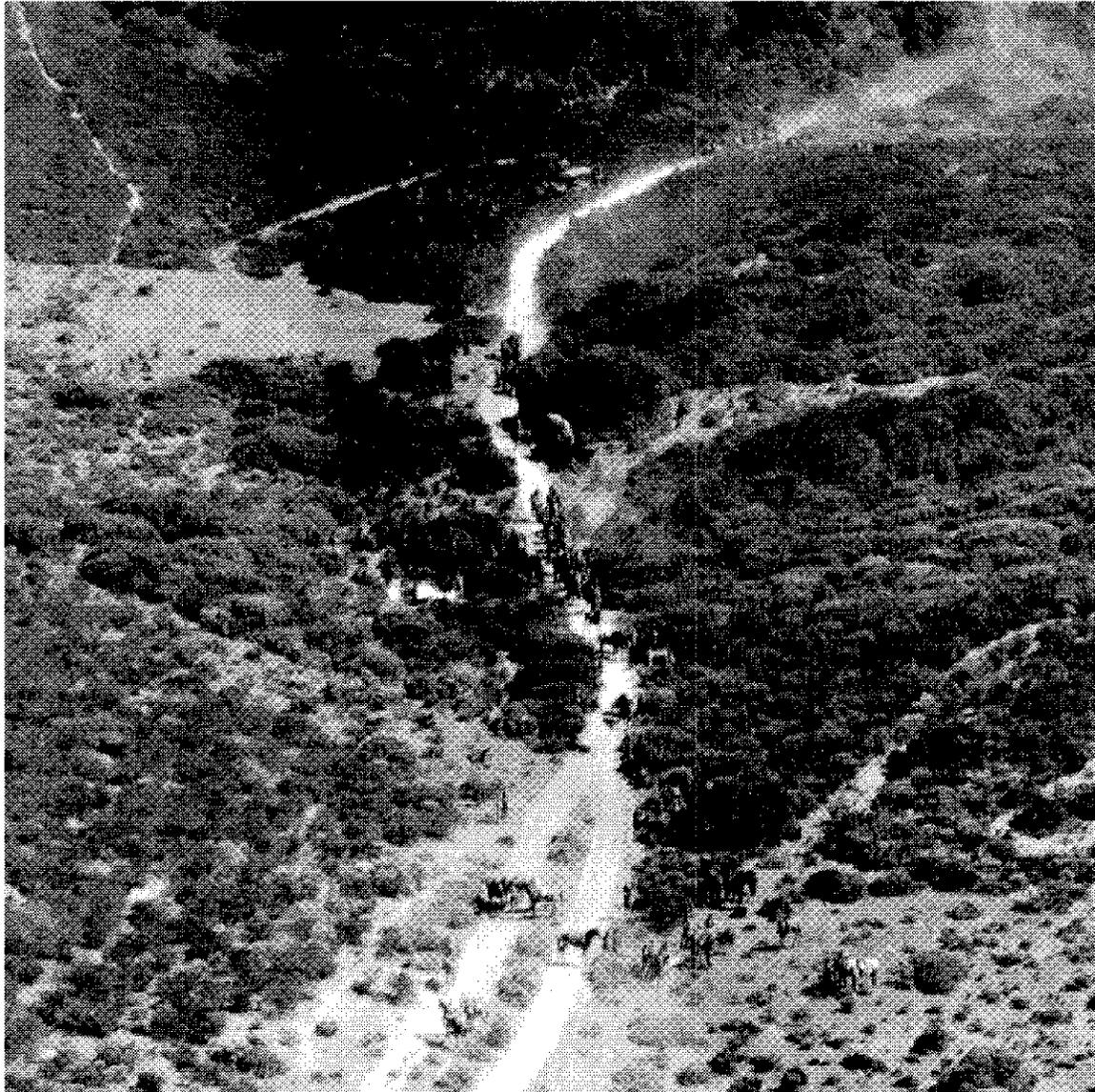


Figure 23. Presidio of Monterey cavalry troops training at what became Fort Ord. This photograph was taken in September 1930; the last horse cavalry units were disbanded immediately prior to American involvement in World War II. (Source: The National Archives.)

reluctantly agreed; citizens generally preferred the hospital to be located outside of the popular park. The hospital was built in stages between 1920 and 1937.

The decision to build in Balboa Park proved to be problematic as the hospital began to grow, especially during World War II. The staff and patient loads increased dramatically between the late 1930s and the end of World War II, forcing the Navy to seek more and more park land to accommodate the need. In recent years, the Navy has built an entirely new facility in Balboa Park, while returning most of the old hospital buildings to the city.

Examples:

- *Naval Hospital, Balboa Park, San Diego*—Listed in the National Register as an historic district.
- *Expansion of Naval Hospital, Mare Island*—Hospital buildings identified as contributing elements of the Mare Island Historic District.

Registration Requirements

There are only two known properties that exemplify this property type: Mare Island hospital and the Naval Hospital in Balboa Park. There are, as noted, other smaller dispensaries on the various individual stations, but these small clinics do not warrant discussion under this property type. It appears that all examples of this property type either have been or soon will be transferred to the control of local authorities. It is unlikely that any more examples of this property type will be found on land controlled by DoD. Therefore, registration requirements are not provided for this property type.

6.8.2 Property Type: Army Hospitals

The Presidio of San Francisco had long been home to a substantial Army hospital, but Letterman grew into one of the Army's premier medical facilities during these years. As noted in an earlier section, Letterman was designated as the Army's first general hospital at the turn of the century and had grown at a rapid rate in the years before World War I. The Army continued to expand Letterman during the interwar years, making it the only major Army hospital in California during this period. Smaller hospitals or dispensaries were built on individual bases, including a substantial facility at Hamilton Field.

Examples:

- *Letterman Hospital (expanded in the interwar years)*—Listed in the National Register as part of the Presidio of San Francisco.

- *Hospital at Hamilton Field (an Army Air Corps facility)*—Listed in the National Register as part of an historic district.

Registration Requirements

Apart from small dispensaries at the various Army posts, Letterman Hospital represented the only Army hospital in operation in California during these years. As discussed in other sections, Letterman's success as a medical institution caused it to suffer from the historic preservation standpoint; the context for historic buildings has been diminished through multiple generations of work there. It is not anticipated that any other Army hospitals from this era will be identified or evaluated. Since Letterman Hospital and the hospital at Hamilton Field have already been listed on the National Register, additional registration requirements are unnecessary for this property type.

6.9 THEME 9: INTERWAR-ERA COASTAL DEFENSE

Each generation of coastal defense batteries and guns installed in California tended to reflect lessons learned in the last war. The vulnerabilities of "Third System" forts during the Civil War gave rise to the scattered guns of the Endicott and Taft-era construction. The experiences of World War I, particularly the introduction of aircraft as an instrument of war, changed again the nature of coastal defense construction.

During the interwar period, the Army upgraded existing defensive positions but did not establish new batteries. Two major improvements were made: installation of bigger guns and the introduction of anti-aircraft guns. These types of improvements were made at all major installations in San Francisco, Los Angeles, and San Diego. Many of the new weapons were huge 16-inch guns, reused from battleships and cruisers that had been scrapped under international naval disarmament agreements. This development set the stage for World War II-era coastal defense strategy, which was built around the use of long-range 16-inch guns and smaller short-range and anti-aircraft guns.

6.9.1 Property Type: Coastal Defense Batteries

During this period, the emphasis of Army planners was on retrofitting old batteries with new and more powerful guns. Indeed, the general trend was toward abandonment of many of the older, outmoded batteries while modernizing select positions with 16-inch guns, which had a range of over nine miles. This program of modernization proceeded slowly; only a few of the 16-inch guns had been installed before the build-up to World War II in the late 1930s.

Examples:

- *Battery upgrades in San Francisco and Marin counties*—Listed in the National Register with the Presidio of San Francisco, Fort Mason, and the Forts Barry, Baker, and Cronkhite historic districts.
- *Battery upgrades at Point Loma*—Listed in the National Register with batteries from other era.
- *Battery upgrades at Fort MacArthur*—Listed in the National Register.

Registration Requirements

Interwar coastal defense installations appear to have represented a transition between the facilities of the Endicott or Taft-era batteries and the major large gun installations of World War II. The two new elements of the batteries from this period appear to have been inclusion of 16-inch guns and inclusion of antiaircraft guns, both responses to the lessons of World War I.

As discussed throughout this report, coastal defense installations have been inventoried and registered more comprehensively than any other discrete type of military resource. While it is possible that remote gun installations still exist on non-military lands, it is unlikely that new coastal defense installations from the Interwar Era will be discovered on land controlled by DoD. If new batteries from the Interwar Era are discovered, these should be evaluated in the larger context of coastal defense sites, which have been found to qualify for the National Register on a very consistent basis.

6.10 THEME 10: MILITARY ARCHITECTURE OF THE INTERWAR ERA

Two developments affected profoundly the appearance of military installations from this period. First, many of the bases were functionally distinct from earlier facilities. There was no independent Marine Corps base, for example, before this period and so there was no traditional basis against which it might be measured. Second, the architects and engineers of the military were influenced by early city planning concepts. City planning grew in the 1920s from the City Beautiful Movement of the early 20th century. While it promoted many ideas, the City Beautiful Movement emphasized the need for coordinated urban design, built around grand boulevards, key public buildings, and partitioning of functions – what would be called zoning in the 1920s. In their own words, architects working for the military expressed their admiration for these concepts of integrated design. A military base, especially one built from scratch, was particularly suited to this type of careful blending of architecture, site planning, landscape architecture, and the partitioning of functional units. The best of the bases from this period – March Field, Hamilton Field, MCRD, NAS North Island, the Naval Hospital in San Diego – illustrate this trend.

In addition to the impact of “total base design” ideas, the architecture of the Interwar Era was heavily influenced by two additional factors: the use of private architects in the design of military bases, and the importance of the Mission Revival style as an architectural idiom. These trends were not necessarily related to one another or to the “total base design” concept. For example, the Quartermaster Corps (Army and Air Corps) and BuDocks (Navy) decided during the 1920s and 1930s to employ private architects in the design of military buildings, much as the Treasury Department used private architects during the same period to design post offices and Federal courthouses. This trend was part of larger Federal policy from the period. The use of the Mission Revival Style by military designers from this period reflects the popularity of that style within the larger population, particularly among Californians.

The three trends came together, however, in the design of several of the new California bases built during the Interwar Era, bases that are regarded by many as being among the most beautiful military facilities in the United States. The most notable bases from this era are MCRD, NAS North Island, and March AFB, each of which was designed by private architects in the Mission Revival or Spanish Colonial Revival Style. These three also reflect better than any other bases in California the impact of the “total base design” concept, in which all buildings from houses to warehouses were designed according to a consistent architectural program. These three bases are highly important within the context of military architecture. They are also good examples of the work of the designers (Myron Hunt and Bertram Goodhue) and are among the best ensembles of Mission Revival/Spanish Colonial Revival buildings in the state.

6.10.1 Property Type: Bases Designed According to “Total Base Design” Concepts

The “total base design” of interwar military bases differs from older bases only in the degree to which architecture, site planning, and landscape architecture are integrated. As discussed earlier, the military has necessarily taken “zoning” into account in base layout because the residential and industrial facilities are in such close proximity. The military has also long held to the notion that base architecture should proceed along a consistent theme.

The bases from this era, then, are consistent with earlier traditions but approach the task of integration with steadfastness rarely seen before or since. Arguably the quintessential base from this period is March AFB, which was designed by the Quartermaster Corps, but with considerable input from well-known City Beautiful advocate George B. Ford and architect Myron Hunt. Hunt designed many of the buildings there, introducing his own interpretation of the Mission Revival Style; Hunt was a leading proponent of this style. Ford’s contribution to the site planning created a triangulated plan that is apparently unique within the military in California

(see Figure 24). Prevailing winds forced the Air Corps to build its runways diagonally across the square parcel, leaving a triangular shape for the cantonment area. Ford and the Quartermaster Corps took advantage of this shape, laying out the street pattern to create a series of small triangles. The plan, which can be confusing on the ground, is best evident from the air, which, of course, was the way it was seen by many of its permanent residents and visitors.

Examples:

- *March Field Historic District, March AFB*—Listed in National Register.
- *NAS North Island*—Listed in National Register.
- *MCRD San Diego*—Listed in the National Register.
- *Hamilton Field*—Listed in the National Register as an historic district.
- *NTC San Diego*—Determined eligible for listing in National Register.
- *Naval Hospital, San Diego*—Listed in the National Register.
- *NAS Sunnyvale (now Moffett Federal Airfield)*—Listed in the National Register as an historic district.

Registration Requirements

Not surprisingly, the bases that best exemplify this theme and property type have been listed in the National Register as historic districts. The values of this theme call for integrated architecture and site planning, values best appreciated when a large percentage of the original design, including the site plan and landscaping, is intact.

6.10.2 Property Type: Bases Designed by Private Architects

Seen in the long perspective, the vast majority of military buildings in California built before 1945 were designed by architects from the two principal design agencies: the Quartermaster Corps for the Army and Air Corps (Air Force) and BuDocks (Navy and Marine Corps). From time to time, however, the military asked private architects to design individual buildings on some military bases in the state. The Reid Brothers of San Francisco, for example, designed the Marine Corps buildings on the 1900 NTS at Yerba Buena Island. A small number of 19th century and early 20th century buildings at Mare Island were also designed by private architects. These buildings were the exception rather than the rule in a larger pattern of government-designed buildings for bases associated with all branches in California.

During the interwar years, however, the military built in California three notable exceptions: MCRD and NAS North Island, both designed by Bertram Goodhue; and March Field, in which a number of key buildings were designed by Myron Hunt (see, for example, Figure 25). This

development was largely serendipitous and not part of a larger trend by the Quartermaster Corps or BuDocks toward use of private consulting architects.

The buildings at March AFB, MCRD, and NAS North Island represent expressions of the vision of the particular architects, architects who were known for their steadfastness in pursuing their goals, not only of particular buildings but for entire ensembles of buildings. Goodhue, for example, had designed building complexes at West Point and at the World's Fair in San Diego before working on MCRD and NAS North Island. Hunt had designed the Rose Bowl and the university complex at the California Institute of Technology before turning to March Field. The importance of MCRD, NAS North Island, and March Field relates to the totality of the site plan and not the individual buildings there, although there are notable individual buildings as well.

Examples:

- *MCRD, San Diego*—Listed in the National Register as an historic district.
- *NAS North Island*—Listed in National Register as an historic district.
- *March Field, Riverside County*—Listed in National Register as an historic district.

Registration Requirements

These three facilities represent a series of almost accidental encounters between the military and the upper tier of architects in California, reflecting the input of local “boosters” as much as a desire by the Quartermaster Corps or BuDocks to employ well-known and successful private architects. Bertram Goodhue happened to be in San Diego designing the Panama-California Exposition in Balboa Park as the Navy was planning to construct permanent buildings at NAS North Island, as well as the Marine Corps Base (later MCRD). Local boosters who had recently organized the highly successful World's Fair were responsible for the suggestion that the Navy use Goodhue's services in designing these two new facilities. Myron Hunt also happened to be working in Riverside on a major addition to the Mission Inn when the Air Corps decided to build a permanent airfield at nearby March Field. Frank Miller, the owner of the Mission Inn and a booster for all things Mission Revival in Riverside, pleaded with the Army to build its airfield in the Mission Revival and to use the services of Myron Hunt, who had done as much as any other architect in southern California to popularize that style.

Thus, it was accident as much as design that these two well known and highly successful architects were asked to design military facilities in California. Buildings and structures in the three facilities are listed as historic districts, which is very appropriate, given the nature of this theme. Both Goodhue and Hunt were concerned with the total layout of the facilities, although

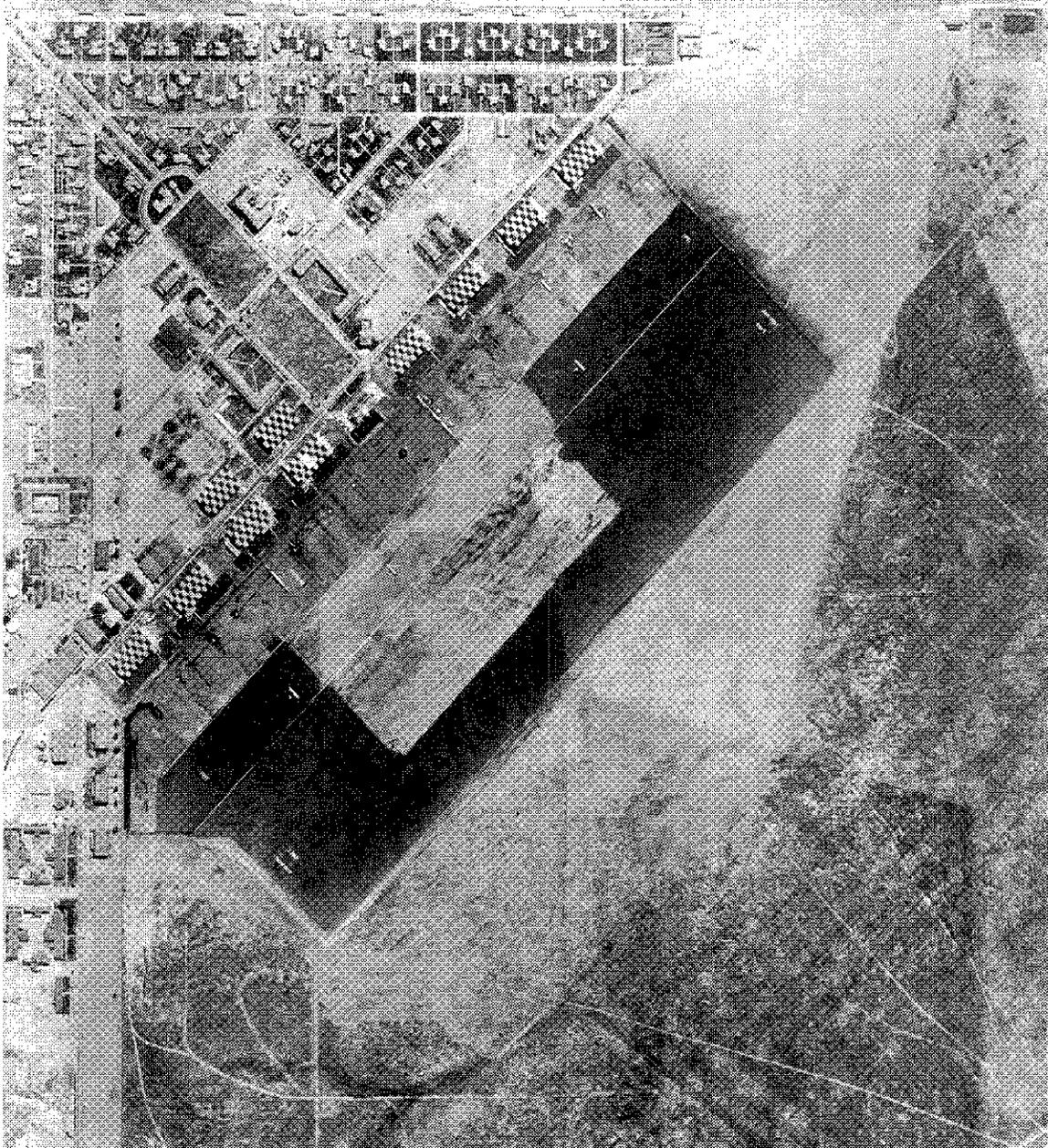


Figure 24. March Air Force Base from the air, ca. 1930. The elaborate triangulated site plan is best seen from the air, which, of course, is how it was viewed by many. (Source: The National Archives.)

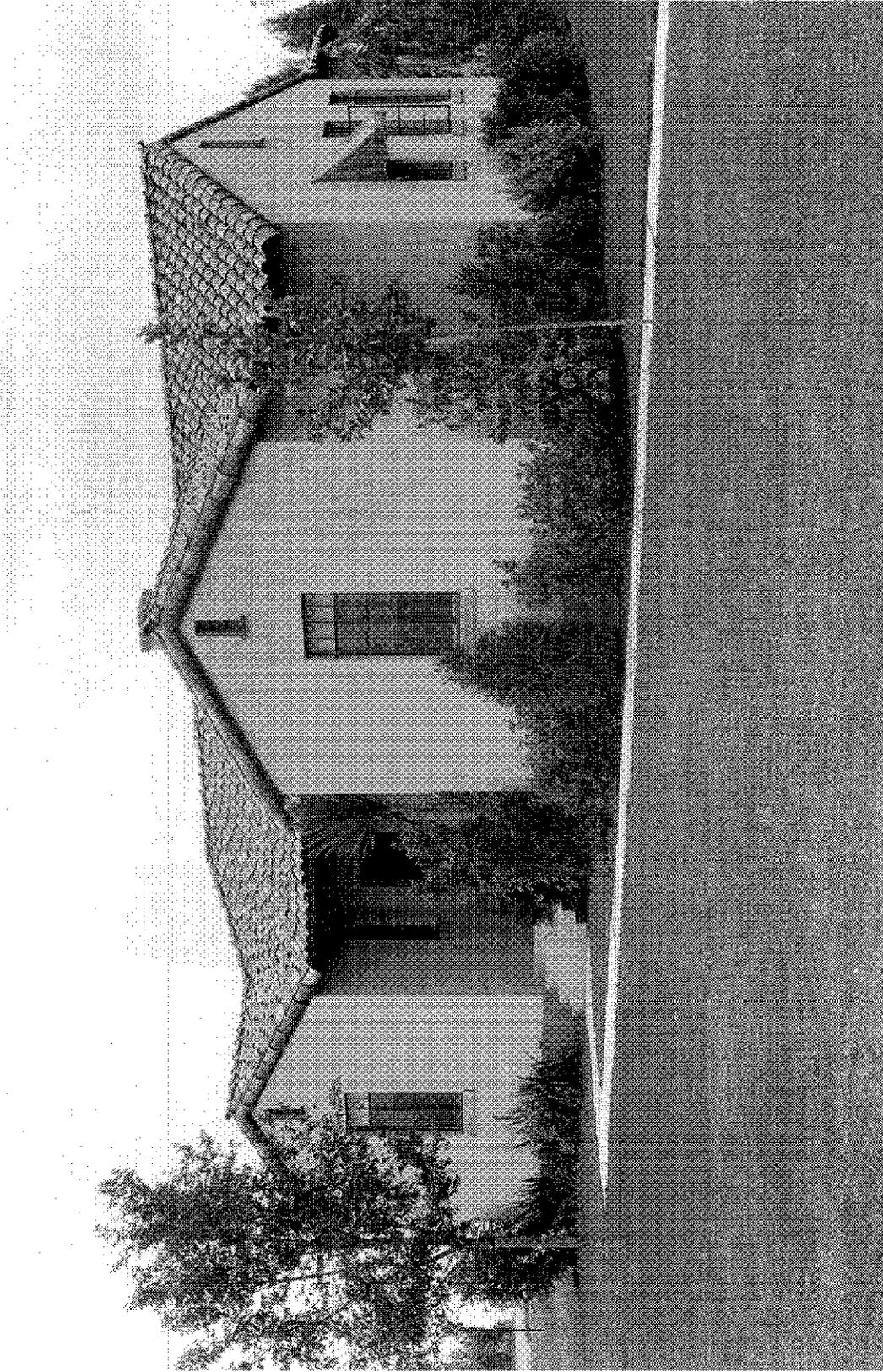


Figure 25. Officers' Quarters, March AFB. The Mission Revival homes were designed by Myron Hunt specifically for March AFB, but were built by the Army and Air Corps at bases throughout California and the Southwest. (Source: The National Archives.)

Goodhue was more directly involved in site planning than was Hunt. Both sought to integrate building design, site planning, landscaping, and all other elements into a harmonious totality.

It is unlikely that any comparable facilities will be discovered elsewhere in California. Private architects have been, and continue to be, involved in the design of military buildings. During World War II, for example, many well-known architects, including Myron Hunt, designed buildings for all branches of the military. The same pattern continued throughout the Cold War. The opportunity given to Goodhue and Hunt during the interwar years, however, was never recreated. During World War II, the contributions of noted architects were limited by two factors: the fact that the branches did site planning and most architectural design; and the limitations imposed by the need for low-cost and rapid construction. The Myron Hunt buildings from World War II at Camp Pendleton, for example, more closely resemble World War II-era temporary buildings than they do the pre-war buildings at March Field. Hunt also designed an addition to the hospital at Fort Rosecrans in the early 1940s. The same observation holds for the work of other important California architects who undertook military design, at least in part because there was little civilian construction occurring during the war years.

It is likely – indeed, probable – that future inventories will identify standing structures on operating military bases that were designed by important private architects. Many of these buildings will date to World War II and many more will be from the Cold War years. It is likely, however, that these will be isolated buildings instead of clusters of buildings that might comprise potential historic districts.

In evaluating these buildings, the standard procedures should be employed for assessing significance under Criterion C, as the “work of a master.” The fact that an important architect designed a building does not, by itself, qualify a building for listing in the National Register.⁵⁰ Rather, the building must be shown to be a *significant* example of the work of the architect in question. It must also retain sufficient integrity to convey the design intent of the architect; integrity becomes an important element under the “work of a master” criterion in that it must be shown to reflect accurately the design intent.

6.10.3 Property Type: Mission Revival Bases, Integrated Design

The “style” of military design is sometimes difficult to classify because it does not always follow civilian design. At the risk of oversimplification, the dominant design motifs of the various eras

⁵⁰ Bulletin 15, “Guidelines for Applying the national Register Criteria for Evaluation,” June 1982 draft, addressed this issue: “A building is not eligible as the work of a master simply because it was designed by a prominent architect. For example, not every building attributed to Frank Lloyd Wright is eligible under this portion of Criterion C.”

may be classified as follows. Throughout the 19th century, the Greek Revival, or compatible neo-classical design, was by far the most common design. In the early 20th century, the Colonial Revival (meaning the English Colonial Revival, as opposed to the Spanish Colonial) was ascendant. During the interwar years, the Mission Revival or closely related Spanish Colonial Revival was the style of choice for construction on military bases throughout California.

The work of Bethany Grashof has documented the complex pattern through which building plans were adopted as “standardized” plans by the Quartermaster Corps; it is likely that a similar process was at work with respect to the Navy’s BuDocks. The Hunt-designed homes for March Field, for example, were copied widely by Quartermaster Corps architects and appear at Army and Air Corps posts from Fort Bliss, Texas to Hamilton Field in California (see, for example, Figure 26).

By the mid-1920s, the Quartermaster Corps had adopted use of regional styles as a matter of policy with Georgian (or English Colonial) being the preferred style for the East Coast and the Mission Revival (or Spanish Colonial) style for the West and Southwest.⁵¹ This pattern was also evident in Navy construction during this same period. While there is no definitive evidence to support the idea, it is logical to presume that California architectural traditions had a powerful influence on the adoption of the Mission Revival as the preferred mode for military construction. The Mission Revival was effectively a California invention and the style was very popular throughout the state during the 1920s and 1930s. The presence of MCRD, NAS North Island, and March Field – all privately-designed facilities from this period – helped demonstrate that the style could be made to work within the context of a military base. In short, it is quite likely that the Mission Revival was a California contribution to military design, just as it had been a contribution to the larger field of American architecture.

As discussed earlier, architects in BuDocks and the Quartermaster Corps adopted during this period a commitment to what was often called “total base design.” The concept incorporated all aspects of design: site planning, architectural program, and landscaping. The Mission Revival or Spanish Colonial design had been used in three of the most successfully designed bases in the state – MCRD, NAS North Island, and March Field. These three facilities had been designed, all or in part, by two major practitioners of the style, Bertram Goodhue and Myron Hunt.

⁵¹ Grashof, Vol. 1, 48-49. Grashof addresses only the use of these styles for family housing for the Army. The same trends dominate other Army construction such as barracks and administrative buildings. There is no equivalent study of the Navy during this period but the trend, at least in California, is quite similar.

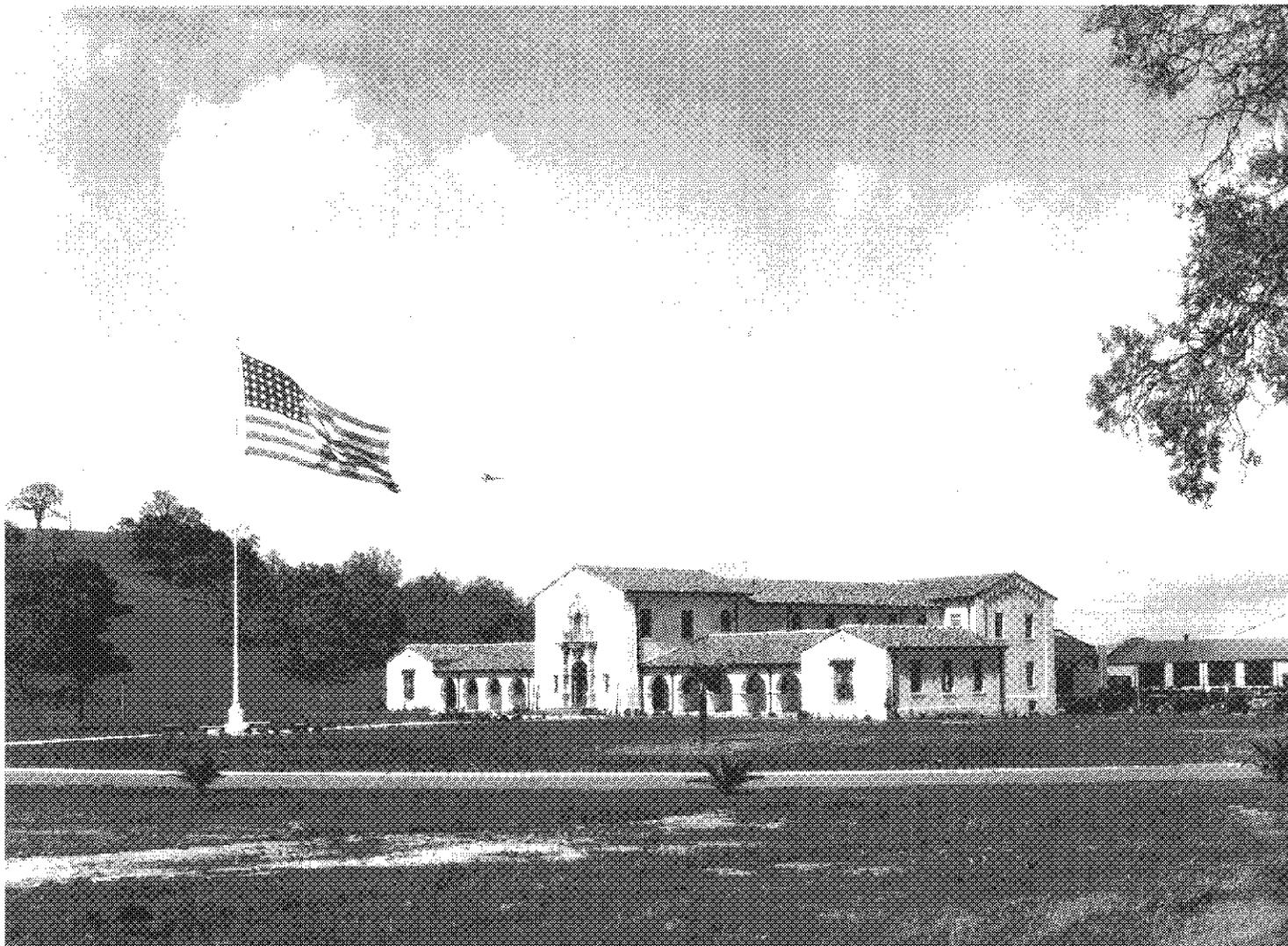


Figure 26. Headquarters, Hamilton Field. The Mission Revival style dominated military design during the 1920s and 1930s. At a few bases, including Hamilton Field, March Field, Naval Training Station, and MCRD, all of the buildings, from barracks to sheds, were designed in the Mission Revival style. (Source: The National Archives.)

In time, however, the Quartermaster Corps and BuDocks adopted the style for its own and built very handsome new bases, drawing upon the inspiration, and sometimes the specific design, developed by Goodhue and Hunt. BuDocks, for example, copied Goodhue's site plan and building types for the NTS, which so closely resembles Goodhue's work at NAS North Island and MCRD that it is tempting to conclude that Goodhue worked on it, although he did not. The Navy also designed and built the Goodhue-esque Naval Hospital in San Diego during the same period.

Later stations, great and small, continued the general theme of Mission Revival design. NAS Sunnyvale (the large dirigible facility) included Mission Revival design in all original early 1930s buildings, other than the huge hangars. Even the small Chollas Heights Radio Receiving Facility, built in 1914 but expanded in the 1920s, was fitted with Mission Revival buildings.

Examples:

- *March Field*—Listed in the National Register as an historic district.
- *MCRD*—Listed in the National Register as an historic district.
- *Hamilton Field*—Listed in the National Register as an historic district.
- *NAS North Island*—Listed in the National Register as an historic district.
- *Naval Hospital, San Diego*—Listed in the National Register as an historic district.
- *NAS Sunnyvale Historic District (now Moffett Federal Airfield)*—Listed in the National Register as an historic district.
- *Chollas Heights Naval Radio Transmitting Facility*—Found to qualify for the National Register as an historic district. (These buildings no longer exist.)

Registration Requirements

There remains an abundance of Mission Revival-style military bases in California. The facilities are so numerous, in fact, that any new evaluation of this property type should take into account the larger context, specifically the large number of high quality facilities that exhibit this property type. It would be difficult to make the case that a building qualifies for the National Register on this basis alone, i.e. as a military base from this period in the Mission Revival style. Rather, it should be evaluated with respect to its importance within that context; given the large number of high-quality properties that represent this theme, is this installation significant as an example of this property type? Similarly, it is reasonable to expect that a National Register-eligible property, evaluated as an example of this property type, would retain a high proportion of its character-defining elements, i.e. the specific elements that make it an example of this property type.

6.10.4 Property Type: Mission Revival Buildings, Isolated Examples

The Mission Revival Style provided designers of new bases with an integrated architectural program that lent itself well to the concept of “total base design.” The use of the Mission Revival proved to be especially successful when architects were given the opportunity to design all buildings and structures and where there were no other buildings that were not of that style. The popularity of the Mission Revival style was so great, however, that architects for both branches were inclined to use it, even in the older bases that were dominated by Greek Revival and Colonial Revival buildings. During the 1920s and particularly in the 1930s, the Army and Navy began to insert Mission Revival buildings into the landscape at Mare Island, the Presidio of San Francisco, and the Benicia Arsenal. However successful any such building may be on an individual basis, the buildings rarely fit into their environment.

Although this trend was most notable during the interwar years, the Army was precocious in its use of Mission Revival, or Spanish Colonial Revival at the Presidio of San Francisco. The earliest Mission Revival buildings there were constructed in 1912. It also used the Mission Revival in the design of some of the buildings at Fort MacArthur in the 1914-16 era.

Examples:

- *Headquarters building, Benicia Arsenal*—Listed in the National Register as part of an historic district.
- *Hospital additions, Naval Hospital, Mare Island.*
- *Dozens of new buildings in the “North End” of Mare Island, including sentry shack at the entrance to the station.*
- *Homes and other buildings, Fort Winfield Scott, Presidio of San Francisco.*
- *New wings at Letterman Hospital, Presidio of San Francisco.*
- *Post Gymnasium, Presidio of Monterey*—A “Monterey Style” building, constructed in 1934. Listed in the National Register as part of an historic district.

Registration Requirements

Most Mission Revival buildings from the interwar years have been listed in or appear to meet the criteria for listing in the National Register. It is possible, however, that buildings of this style have yet to be inventoried on operating military bases. Two considerations should be taken into account in dealing with any such buildings. First, it should be recognized that these buildings are not rare; both the Army and Navy designed Mission Revival buildings in great numbers during these decades. Second, architects from both branches, as well as private architects working for

the branches, designed very good examples of this style. The Mission Revival/Spanish Colonial Revival buildings at MCRD, NAS North Island, Hamilton Field, and March AFB rank with the best civilian examples of this style in California. The context for the Mission Revival military building is such that there is no need to lower one's expectations in comparison to civilian design. A distinguished example of a military Mission Revival building compares favorably with an example elsewhere in California.

7.0 WORLD WAR II PROPERTIES, 1939-1945

This period begins with American entry into World War II and ends with the end of the war. World War II was arguably the most important development in the history of California, whether considered from the military or civilian perspective. It transformed nearly every aspect of life throughout California. The fact that it was fought in the Pacific as well as the Atlantic exaggerated the impact of the war on California, particularly in coastal areas.

There are two seemingly contradictory characteristics of the World War II-era buildings and structures: their diversity of function and their uniformity of design. The resources are diverse in the sense that they encompassed every conceivable function. Resources from all four branches and every bureau or division within each branch were built during this period. The uniformity, however, relates to the fact that so many World War II-era buildings were constructed according to standardized plans. Although there are subtle differences between Navy and Army buildings, the standard plan buildings from World War II are remarkably similar, especially in terms of the common cantonment buildings, mess halls, barracks, classrooms, and other repetitive types. From the standpoint of design, World War II-era buildings are characterized by their uniformity.

In attempting to construct an interpretive framework for evaluating World War II buildings, it is important to focus on themes rather than property types. A discussion built around property types alone leads to a superficial conclusion that the World War II-era buildings, especially the temporary buildings, are all the same and cannot be distinguished, one from another. By focusing on historic themes, however, the variety of property types becomes more apparent, emphasizing the functions of buildings rather than their appearance alone. For example, thousands, probably tens of thousands, of Quonset huts were built throughout California during the war. Most were routine in appearance as well as in use. A few Quonsets, however, were assigned important functions, such as a Quonset hut at NAWS China Lake, which was used as part of the testing of the "Fat Man" atomic bomb.

The Quonset hut is exemplary of the building practices of the military during the World War II Era, a period in which numerous buildings and structures were built to temporary standards. Owing to shortages of time, money, and materials, the military built permanent buildings under three conditions: for safety, as with ammunition magazines; because the function was highly-valued, as with administration buildings or research laboratories; or because the military felt the function would be needed after the war, as with dry docks and some aircraft hangars. Not

surprisingly, the vast majority of World War II-era buildings that have been determined eligible were built to permanent standards.

World War II temporary buildings are unique among military resources in that they are covered by a nationwide programmatic agreement, prepared and signed by ACHP and NCSHPO. This programmatic agreement was signed in 1986 and provides that any DoD branch may demolish any buildings classified as “temporary” and dating from the World War II Era (1939-1945) without review under standard provisions of Section 106 of the NHPA.⁵²

7.1 THEME 1: PRE-WAR PREPAREDNESS

In 1938 and 1939, as it became increasingly apparent that the United States would be drawn into war in Europe and Asia, Congress appropriated funds for expansion of American troop strength and construction at military bases. The bulk of new construction occurred on established bases, but a handful of entirely new bases were built as well. Most of the new buildings constructed during this period were built to the usual peacetime standards in terms of permanence of construction material and attention to architectural detail and site planning. The construction standards for the permanent, pre-war bases were in some respects a continuation of the pattern of the interwar period. Some of these bases, however, were distinctive architecturally, a characteristic addressed in Theme 12 (Military Architecture of World War I).

7.1.1 Property Type: New Permanent Installations, Established and Built, 1939-1941

The new, permanent bases from the 1939-1941 period were funded and built while the country was preparing for war, but not actually at war. Construction during this period, particularly for the Navy and Army Air Forces (AAF; predecessor to the Air Force), more closely resembled that of the interwar years than the later wartime construction. The resemblance was true in terms of the quality of construction as well as the quality of design. The permanent bases from this period in many ways continued the “total base design” tradition of the interwar years. The bases were unified with respect to architectural program, site planning, landscaping, and building materials.

The important characteristic of these bases is that they were designed and built in a very short period of time and as such are distinctive examples of construction trends in the late 1930s. The dominant construction material throughout these bases is reinforced concrete. Concrete was used extensively in industrial military buildings as early as 1900. During the late 1930s, it was used

⁵² The provisions of the Programmatic Agreement and its relation to Historic American Buildings Survey documentation are discussed at length in: John S. Garner, “World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States,” USACERL Technical Report CRC-93/01, March 1993.

for all types of buildings, from offices to barracks. The massive permanence of the 1939-1941 buildings is easily distinguished from the temporary wooden buildings of 1942-1945. Figure 27 is a photograph of Building 251 at McClellan AFB, a hangar typifying the permanence of pre-war construction.

Examples:

- *Sacramento Air Depot Historic District (McClellan AFB)*—Listed in the National Register.
- *NAS Alameda Historic District*—Determined eligible for listing in the National Register.
- *Naval Supply Depot (NSD), Oakland (FISC Oakland)*—Determined eligible for listing in the National Register.
- *Roosevelt Base Historic District, Naval Station Long Beach*—Determined eligible for listing in the National Register.
- *Naval Station, San Diego*—Found to qualify for the National Register as a 20-building historic district, centered primarily around 1939-1941 permanent buildings.

Registration Requirements

This historic theme has been documented extensively through the listing or determination of eligibility for numerous historic districts on installations that were built up during this period. The National Register historic districts at McClellan AFB, NAS Alameda, FISC Oakland, and Roosevelt Base in Long Beach and Naval Station, San Diego represent a broad range of types of facilities established during the pre-war build up. Some of these historic districts, especially those at McClellan AFB and NAS Alameda, are also significant architecturally.

This important theme is well-represented in properties listed in or determined eligible for listing in the National Register. Future evaluations should take this into account. Any future listings for pre-war preparedness military bases should possess levels of significance equal to or surpassing those of the historic districts that have already qualified for National Register listing.

The bulk of the pre-war permanent bases were inventoried and evaluated as historic districts, recognizing that the bases were unified along consistent design criteria and as functionally coordinated groups of buildings and structures. This is especially true of McClellan AFB and NAS Alameda. The Naval Supply Center, Oakland was also built to permanent standards, but along largely utilitarian lines.

The historic districts at McClellan AFB, Roosevelt Base (Naval Station, Long Beach), and NAS Alameda are distinctive architecturally, differing substantially from the design of buildings

during the 1920s and even more markedly from the temporary architecture that dominated wartime construction. The design of these buildings was so distinctive that it is treated as a separate theme, Theme 12.

7.1.2 Property Type: Permanent Construction on Existing Installations

During the pre-war build up, the various branches also constructed new, permanent buildings on the older, existing installations. As with the entirely new bases, this pre-war permanent construction was built to a very high standard in terms of the permanence of material and quality of design. The new work, however, was not always consistent architecturally with the established design themes of the older installations, particularly the very old bases such as Mare Island and the Presidio of San Francisco.

Examples:

- *Late 1930s hospital additions, administration building, other new construction at Mare Island*—Listed in the National Register as part of the Mare Island Historic District.
- *Massive shops, such as Building 680, at Mare Island*—Listed as contributing elements of Mare Island Historic District.
- *Late 1930s additions to MCRD, San Diego*—Listed in the National Register as part of an historic district dominated by early 1920s construction.

Registration Requirements

The pre-war permanent buildings at the older military bases may be significant individually or as part of an historic district, as is often the case with the older facilities. The eligibility of these properties as parts of existing historic districts hinges upon the significance of the buildings as well as their compatibility, architecturally or functionally, with older buildings in the area. A large percentage of the contributing buildings and structures at Mare Island, for example, date from World War II, which was an important era in the overall history of that shipyard.

These buildings may also qualify individually. In this case, the registration requirements will be those of any individual building: it must be shown to be significant historically or architecturally and must retain integrity to its original appearance, or its appearance at the time in which it achieved significance. The major dry docks at Hunters Point and Naval Station, San Diego, for example, were found to qualify for the National Register because they were significant and retained integrity.

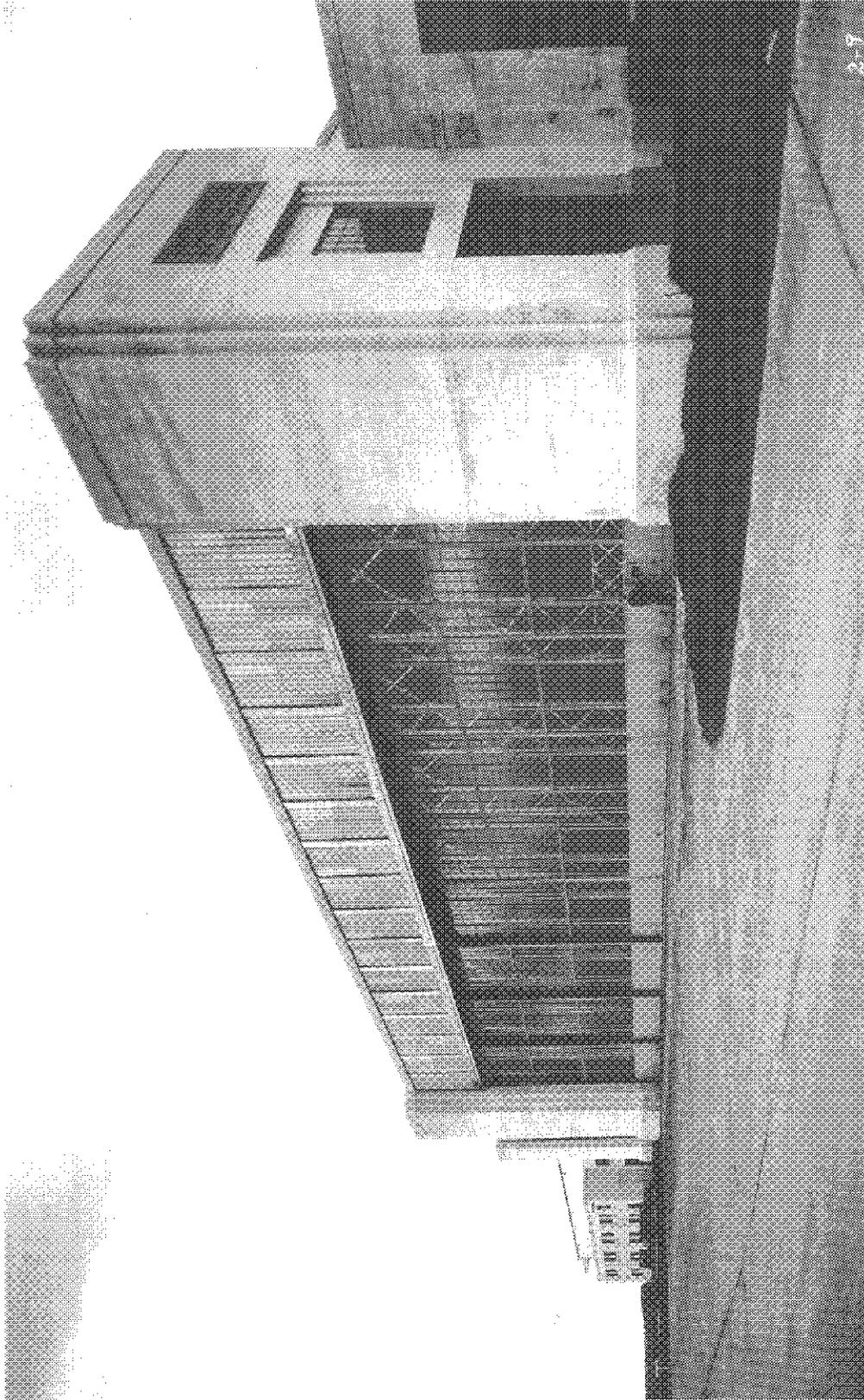


Figure 27. Building 251, the great repair hangar at McClellan AFB (then called the Sacramento Air Depot). Built of reinforced concrete and steel, this hangar typified the permanence of pre-war construction. Only rarely were wartime hangars built to such standards. (Source: the National Archives.)

In most cases, the significance of these individual properties will be captured by other themes presented in this chapter. The two dry docks, for example, were important contributors to the large program to repair battle-damaged ships; that function is discussed in Theme 5 below.

7.2 THEME 2: AVIATION TRAINING

For various reasons, California was the site of a major part of the military's aviation training program. The state's bases led the nation in aviation training, going back to the pre-World War I Army and Navy airfields on North Island. The domestic aircraft industry was also centered in California, especially in Los Angeles and San Diego, making it convenient to bring aircraft to the trainees. In addition, the war in the Pacific was heavily dependent upon aircraft, both in land and sea battles. For all of these reasons, aviation training was a very active part of the military's presence in California during the war. This was true of the AAF, the Navy, and the Marine Corps.

The expansion was so rapid and extensive that it affected all parts of California. Before 1941, the vast majority of all military bases in California were concentrated in coastal counties, particularly in the San Francisco Bay Area, Los Angeles, and San Diego. During the war, the Army and Navy built dozens of airfields, from major installations to small outlying fields.

7.2.1 Property Type: Naval Air Stations

The Navy entered World War II with major air stations in Alameda, North Island (near Coronado), and a minor air station on Terminal Island, which is today partly administered by Los Angeles and partly by Long Beach and was probably in the Long Beach area. It appears that the Navy did not put its construction efforts into building major new air stations, although it did establish a few, but concentrated on building smaller satellite Naval Auxiliary Air Stations (NAASs) and Naval Air Fields (NAFs), discussed as a separate property type (see Section 7.2.2).

Examples:

- *NAS Alameda*—Determined eligible for listing in the National Register as a historic district, with the focus on pre-war buildings.
- *NAS North Island*—Not evaluated for World War II-era significance.
- *NAS Livermore, now Lawrence-Livermore Laboratory*—Apparently not inventoried; Department of Energy facility.
- *NAS, Los Alamitos*—Not inventoried or evaluated; under control of California National Guard.
- *NAS, San Pedro*—Not inventoried or evaluated; not government-controlled.

Registration Requirements

As is the case with other types of bases, the World War II-era NAS buildings and structures differ fundamentally between pre-war and wartime construction. The pre-war buildings were permanent; the wartime buildings were generally temporary. The Navy, for example, built a massive seaplane hangar in 1941 on NAS North Island. This building (Building 340) has been listed in the landmarks program of the American Society of Civil Engineers (ASCE) as the largest reinforced concrete hangar in the United States. It has not been evaluated for National Register eligibility, although the ASCE documentation appears to support National Register eligibility as well. The fact that the building was constructed in 1941 rather than 1942 supports the general conclusion regarding the degree of permanence of pre-war buildings relative to wartime buildings.

It will also be noted that the Navy retained very few of its temporary NAS facilities. NAS Moffett Field, Naval Auxiliary Landing Field, Crows Landing was an exception. The large stations at Los Alamitos and Livermore were declared surplus shortly after the end of the war. What remains, then, are World War II-era buildings on stations that were established before the war. The NAS Alameda Historic District, like the McClellan Historic District, includes a number of contributing temporary World War II buildings. Those wartime buildings outside the district were not found to qualify for listing on the National Register because they had been so altered for adaptive reuse or their setting had been significantly changed during the Postwar Era that they no longer met the integrity criteria for listing on the National Register.

World War II-era NAS buildings should be inventoried and evaluated with an emphasis upon events rather than architecture or engineering. With rare exceptions, World War II-era NAS buildings are likely to be temporary and standardized and for that reason unlikely to qualify for the National Register on the basis of design considerations. Those with unique design elements, such as the NAS North Island hangars, are important to the extent that they defy that generalization. Care should be taken, however, to ensure that the historic significance of buildings is not overlooked.

7.2.2 Property Type: NAAS and NAF Facilities

Although the Navy relied chiefly upon its pre-war NAS facilities, it did expand greatly its use of outlying facilities, including NAAS and NAF facilities. Very little is known about most of these lesser Navy air facilities. The differences between NAAS and NAF facilities were slight, and some stations began as an NAF, but were upgraded to NAAS status as the war progressed.

Examples:

- *NAASs at Brown Field, Chula Vista, Camp Kearny, Salton Sea, Holtville, elsewhere*—NAAS Brown Field, San Diego County, inventoried and a small historic district, centered around “nose hangars” and a control tower, were found to qualify for the National Register. The Salton Sea facility was inventoried prior to transfer to state ownership. It appears that no other World War II-era NAAS facility has been inventoried.
- *NAFs at Vernalis, Crow’s Landing, Mill Field, San Francisco, Monterey, and Santa Rosa*—None of these NAF facilities has been inventoried or evaluated. The Crow’s Landing facility is now owned by the National Aeronautics and Space Administration (NASA) and none of the others are DoD property.
- *Remote landing fields on San Clemente Island and San Nicolas Island*—Both San Nicolas Island and San Clemente Island have been inventoried; no World War II-era resources found to qualify for listing in the National Register.

Registration Requirements

The NAAS and NAF facilities were relatively insignificant elements of the Navy’s aviation training program during the war and most were disposed of shortly after the war. Although little documentation exists, it appears that most of these were fitted with temporary buildings or no buildings at all.

With the exception of the Brown Field inventory, no NAAS or NAF properties, whether treated individually or as historic districts, have been found to qualify for listing in the National Register. Not all of these outlying facilities have been inventoried, but the general trend is apparent from the few that have been. The buildings in the outlying fields were built to temporary standards, often more temporary than was the case with most bases. The buildings on San Nicolas Island, for example, were built to “theater of war” standards, the most temporary standards authorized for habitation. Most of these buildings were demolished soon after the end of the war. Those that survived were so drastically modified that they are scarcely recognizable as wartime buildings.

It is anticipated that any newly discovered bases or buildings that are associated with this theme will follow the pattern of those that have been inventoried to date: the buildings will be World War II temporary structures; and those buildings will have been modified extensively. It is unlikely that a heavily modified temporary building will qualify for the National Register. The possibility exists, however, that there will be exceptions to this rule; these exceptions should be judged on a case-by-case basis.

7.2.3 Property Type: AAF Bases

The AAF built dozens of small training bases throughout California, expanded its existing bases, and in a few instances took over bases from the Navy. The AAF began the war with permanent bases at McClellan (originally called the Sacramento Air Depot, a repair depot), March AFB, and Hamilton AFB. Crissy Field, at the Presidio of San Francisco, closed a few years before the attack on Pearl Harbor, chiefly because the Golden Gate Bridge made use of the field too dangerous. The AAF expanded in three ways: in creating major new airbases, as listed below; in expanding its older bases; and in creating dozens of small outlying fields for training smaller groups of pilots. All of the existing bases were expanded, especially McClellan, March, and Hamilton. The real emphasis, however, was on construction at the entirely new bases, which were scattered throughout the state, generally in undeveloped parts of southern California and the Central Valley, as was the case with the facilities that became Edwards, George, Castle, Norton, and Travis AFB.

Examples:

- *Edwards AFB (Muroc Army Air Forces Base [AAFB] during World War II)*—Extensively inventoried, but no World War II-era resources determined eligible, except for Building 4305, a hangar for testing an experimental aircraft.
- *George AFB*—Inventoried; no properties found to qualify for the National Register.
- *Castle AFB*—Inventoried; no properties found to qualify for the National Register.
- *Norton AFB*—Inventoried; no properties found to qualify for the National Register.
- *Travis AFB*—Inventoried; no World War II-era properties found to qualify for the National Register.
- *Mather AFB (a World War I-era base, reactivated during World War II)*—Inventoried; no properties found to qualify for the National Register.

Registration Requirements

It appears that almost no World War II-era building or structure associated with this theme has been found to qualify for listing in the National Register. This pattern closely parallels that of NASs. The exceptions are a few buildings that were included as part of historic districts dominated by pre-war permanent buildings at McClellan and Hamilton, and Building 4305 at Edwards AFB.

There may be several explanations for this low rate of eligibility for World War II Air Forces buildings and structures. First, the World War II-era bases were heavily reused after the war, resulting in major new construction programs there. The World War II-era buildings were either

demolished or are outnumbered by Cold War buildings. Second, the World War II-era buildings were temporary or semi-permanent in design and were modified extensively after the war. Third, the buildings are undistinguished architecturally because they were, in most cases, based on standardized plans.

Building 4305 at Edwards AFB is the exception that helps explain the rule for World War II-era Air Forces properties. Building 4305 was associated directly with an emerging jet aircraft testing program at Muroc AAFB and its use presaged the highly significant experimental aircraft program that would define much of the significance of Edwards AFB during the Cold War. The importance of the program and Building 4305 are discussed under Theme 6 (Section 7.6) below.

The low rate of eligibility does not suggest that California bases were not important to the training program of the AAF during the war. At some point, the Air Force, as well as the other service branches, may wish to revisit eligibility of World War II-era resources, with an eye toward evaluation of properties that are potentially significant for their association with important events, rather than emphasizing significance in architecture or engineering. With rare exceptions, the Air Forces properties will not be found to be significant under National Register Criterion C.

7.2.4 Property Type: Outlying AAF Bases

The AAF built outlying landing fields during World War II in far greater numbers than did the Navy. The presence of these fields is commemorated, to a large extent, by small municipal or private airfields, in scattered communities throughout rural California, including Redding, Chico, Marysville, Santa Rosa, Suisun, Stockton, Visalia, Porterville, Bakersfield, Salinas, Lemoore, Palm Springs, Thermal, Delano, Half Moon Bay, and Blythe. Nearly all of these were abandoned by the military at the conclusion of the war, with the land reverting to private ownership or, more commonly, to local communities for use as landing strips. A few, such as the facility at Lemoore, were reactivated during the Cold War; Lemoore is now a major NAS. The vast majority, however, have not been used by the Federal government since 1945, except for occasional use by the Air Force Reserves or California Air National Guard.

Examples:

- *Landing Field, Palmdale (later Air Force Plant 42)*—Inventoried and some buildings have been found to qualify for listing in the National Register, but apparently not for their associations with World War II.

- *Dozens of small landing fields, including: Redding, Chico, Marysville, Santa Rosa, Suisun, Stockton, Visalia, Porterville, Bakersfield, Salinas, Lemoore, Palm Springs, Thermal, Delano, Blythe, and many more*—None of these have been found to meet the criteria for listing in the National Register.

Registration Requirements

Available evidence indicates that no example of this property type has been found to meet the criteria for listing in the National Register. This parallels the situation with the outlying landing fields of the Navy. The explanations for this universal non-eligibility are likely the same as those for the Navy outlying fields: the buildings were constructed to temporary standards and either do not exist or exist only in a modified condition; and the function was generally so routine that it does not constitute significance.

It cannot be said with certainty that DoD does not control any of the wartime AAF outlying fields. While it is known that the majority of these were sold or given away at the end of the war, it is possible that the government retained some of these fields. Any previously unevaluated wartime remote field should be analyzed in the larger context of the AAF training program during the war and should emphasize historic events in addition to architectural values. Given what we know about the AAF program during World War II, is there reason to believe that the remote field in question played a role that went beyond the routine, i.e. was significant within the context of that larger program? While it appears unlikely that significance can be demonstrated, each case should be considered individually, recognizing that some of the fields may have performed extraordinary roles in the larger program.

7.2.5 Property Type: Marine Corps Air Stations

The air wings of the Marine Corps, called Marine Air, expanded greatly in California during World War II, owing to the critical role of Marine Air in support of the “island-hopping” strategy in the Pacific. Three MCAS facilities were built: MCAS El Toro, MCAS El Centro (now owned by the Navy), and MCAS Mojave (no longer owned by the government). The Marines also maintained auxiliary fields, including one at the large Marine Corps base at Camp Pendleton.

The MCAS facilities were built during American involvement in World War II (i.e. after the attack on Pearl Harbor) as opposed to the pre-war build-up, when many of the AAF and Navy airfields were constructed. As a result, the MCAS facilities were fitted with typical wartime temporary buildings. MCAS El Toro, the largest of the Marine Air bases, was built almost entirely of wooden, temporary buildings.

Examples:

- *MCAS El Toro*—Inventoried and evaluated; no buildings found to qualify for listing in the National Register.
- *NAF El Centro (built as MCAS El Centro)*—Inventoried and evaluated; no buildings found to qualify for listing in the National Register.
- *MCAS Mojave*—Not inventoried or evaluated; no longer government-controlled.
- *MCAS Goleta*—Not inventoried; now the site of the University of California, Santa Barbara

Registration Requirements

Two of the four World War II-era MCAS installations have been intensively inventoried and no buildings have been found to meet the criteria for listing in the National Register. The other two are no longer owned by the military. The absence of eligible properties relates primarily to the high incidence of World War II-era temporary buildings, buildings that were modified extensively during the Cold War to prolong their usefulness. MCAS El Toro, for example, includes hundreds of World War II-era temporary buildings, almost all of which were essentially rebuilt during the 1950s and 1960s. Loss of integrity, in short, accounts for the absence of National Register-eligible properties at these MCAS facilities. In general, the comments that apply to the low rate of eligibility for Navy and AAF airfields apply to MCAS facilities as well. One pattern appears to apply to the Marine Corps facilities generally: World War II-era Marine bases, whether training bases, supply depots, or airfields, were built almost entirely to temporary standards, as consistently or more consistently than Army bases.

7.2.6 Property Type: Lighter-Than-Air (LTA) Stations

Early in the war effort, the Navy was supportive of a Lighter-Than-Air (LTA) program due to its promise in anti-submarine warfare. At the beginning of the war, there were two LTA stations nationwide: Moffett Field in California and a station in New Jersey. By the end of the war, the Navy had built seven additional LTA stations, including one in Santa Ana (now MCAS Tustin). Thus, including the LTA station at Moffett Field, California had two of the nine stations nationwide, reflecting the depth of the Navy's involvement in the war in the Pacific Theater.

Examples:

- *Moffett Field Blimp Hangars*—Listed in the National Register as part of Moffett Field Historic District
- *LTA Hangars, MCAS Tustin*—Listed in the National Register.

Registration Requirements

The two LTA stations, Moffett Field and MCAS Tustin, were the only such facilities built in California. The centerpieces of each station are the hangars. One Moffett dirigible hangar dates to the 1930s; two hangars at Moffett and two hangars at MCAS Tustin are World War II-era buildings.

The LTA experiment was relatively short-lived and the resources associated with it have been inventoried and evaluated. It appears that this theme has been exhaustively documented and registered; it is unlikely that any new properties will be listed in the National Register in relation to this theme. Therefore, no registration requirements are provided for this property type.

7.2.7 Property Type: World War II Hangars—AAF

The most imposing buildings on any aviation training facility are the hangars. The AAF built hundreds of hangars in California during the war, from the great repair hangars at McClellan AFB to tiny hangars on remote landing fields in the rural counties of the state.

Although most of the World War II-era AAF bases have been inventoried and evaluated, very few hangars have been found to qualify for listing in the National Register. The wartime hangars at McClellan AFB have been found to qualify for the National Register but these are distinctively different from most hangars in terms of their function and the scale of the buildings. These buildings were constructed before the war and were built to far more permanent standards than were the wartime structures. They were found to qualify for the National Register as part of a larger historic district that includes residential, administrative, and industrial buildings. Only a small number of wartime AAF hangars have been found to qualify individually for the National Register. Building 756 at George AFB was built in 1945, late in the war effort when construction materials were more readily available. It was built with concrete masonry unit walls on a concrete foundation, and was used for B-24 Liberator bombers. Three World War II-era hangars at Edwards AFB were found to meet the criteria for their associations with experimental test flights at Muroc AAFB during the war, as well as for their association with the Cold War testing programs there.

Examples:

- *Repair hangars at Sacramento Air Depot Historic District, McClellan AFB*—Found to qualify as part of the historic district.
- *Building 756, a B-24 Liberator bomber hangar at George AFB*—Found to meet the criteria for listing in the National Register.

- *Buildings 4305, 4401, and 4402, hangars at Edwards AFB*—Found to meet the criteria for listing in the National Register for their associations with experimental test flights at Muroc AAFB beginning during World War II.
- *Building 531, an intact World War II-era hangar at Air Force Plant 42 in Palmdale*—It was found to meet the criteria for listing in the National Register, but chiefly on the basis of its use during the Cold War.

Registration Requirements

There are few instances in which an AAF hangar has been found to qualify for the National Register on an individual basis. This is true, despite the fact that most World War II-era bases have been inventoried and evaluated to some degree.

It is certainly possible that some of the hangars that were found to qualify as part of historic districts would also qualify individually. Building 251 at McClellan AFB, for example, is a massive and structurally complex repair hangar that likely would qualify individually, for the complexity of its engineering and its central role in the repair depot operations at McClellan during World War II and the Cold War.

It is likely that dozens of World War II-era Air Forces hangars are still in existence. In previous evaluations of these World War II-era buildings and structures, historic significance has proven to be more important than architectural significance. This general pattern has held true for AAF hangars as well. These hangars are as standardized as, say, barracks or mess halls. It is unlikely that many hangars from this period will qualify for the National Register on the basis of Criterion C. It is more likely that a property of this type will qualify on the basis of its association with specific events or patterns of events.

A good illustration of this last point is a group of three hangars at Edwards AFB. These were temporary hangars that could be disassembled and moved from one point to the next. While they may be of marginal interest in terms of the engineering of a portable hangar, the buildings qualify for the National Register on the basis of their associations with the early aircraft test programs at Muroc AAFB. This testing program laid the foundation for the Cold War jet aircraft and spacecraft testing programs at Edwards AFB, a program discussed in Theme 12. If judged on the basis of engineering alone, it is doubtful these hangars would qualify. Taking into account their association with the testing program, however, the hangars are strong candidates for National Register listing.

7.2.8 Property Type: World War II Hangars—Navy and Marine Corps

It is likely that there were nearly as many Navy and Marine Corps hangars as AAF hangars built in California during World War II. While there were distinct differences between the Navy-Marine Corps hangars and those of the AAF, many of the generalizations that apply to the AAF hangars apply to this property type as well. The hangars from the pre-war preparedness were built for specific needs and to permanent standards. Wartime hangars were far more temporary and generally built on standardized plans. The Navy apparently developed several distinct standards for differing conditions. Some hangar designs were built for very low-cost construction under adverse conditions, as in the Pacific “island-hopping” campaign. These hangars fell into the general “Theater of War” standards and were buildings that could be constructed by Seabees or other enlisted personnel. Slightly more permanent facilities were planned for stateside stations, with NASs and MCASs being fitted with more permanent structures than outlying fields. It also appears that these hangars, like many World War II-era property types, actually went through three phases of construction: permanent construction, 1939-1941; very temporary construction, 1942-1944; and slightly more permanent construction, as scarce building materials began to appear in greater supplies, late during the war effort.

Examples:

- *Building 340, a 1941 hangar at NAS North Island*—Listed in the landmarks program of ASCE as the largest reinforced concrete hangar in the United States; has not been evaluated for National Register eligibility.
- *Brown Field nose hangars*—Determined eligible for listing in the National Register.
- *World War II hangars at numerous NAS, MCAS and NAF facilities*—All found not to qualify for listing in the National Register.
- *World War II-era Hangar 1 at NAWS China Lake*—Found to qualify for the National Register for the distinctiveness of its design as well as for its associations with the Cold War weapons testing program.

Registration Requirements

The situation with Navy and Marine Corps hangars is much the same as with AAF hangars of the same period. A few noteworthy hangars have been found to qualify for the National Register, while the vast majority have not. The large concrete hangar at NAS North Island is exceptional for its design. Hangar 1 at NAWS China Lake was found to qualify for its design, for its role in World War II weapons testing, and especially for its role in early Cold War weapons testing.

On balance, the pattern of National Register eligibility for this property type appears to make sense. The eligible hangars appear to be those that are significant because they have historical associations or engineering features that go above and beyond the ordinary.

7.3 THEME 3: AMPHIBIOUS TRAINING

Military planners in the late 1930s anticipated that the war, particularly a war in the Pacific, would involve “ship to shore” or amphibious landings, a specialty of the Marine Corps and the Navy. The Navy and Marine Corps built separate amphibious training facilities during the war: Camp Pendleton for the Marines and Naval Amphibious Base (NAB) Coronado for the Navy. The primary mission of NAB Coronado was to train the boat drivers and handlers, while Camp Pendleton trained the Marines to make landings.

NAB Coronado was constructed in 1943 on the Silver Strand, the narrow peninsula that forms the western perimeter of San Diego Bay. The Navy, of course, had major assets elsewhere in San Diego, including barracks at the NTS and Naval Station, San Diego. The NAB was a training site for these men and was not fitted with many buildings of any sort, permanent or temporary. It was also built late in the war effort, although it was used extensively; 23,000 enlisted men trained at the facility in 1944 and 1945.

The Marine Corps facility at Camp Pendleton was fundamentally different from the NAB. The Marine Corps was and is the most important ship-to-shore force, and the base at Camp Pendleton was used as the primary amphibious training base for the Marines. Amphibious training was arguably the principal contribution of Camp Pendleton to the war effort and was especially important to the long and arduous “island-hopping” campaign through which the war in the Pacific was won. Camp Pendleton, however, was a complex facility and was used for many purposes other than amphibious training. It was to the Marines what Mare Island had been to the Navy in the 19th century—a multiple-purpose base capable of supporting every conceivable Marine Corps function.

The 125,000-acre base was large enough to accommodate nearly every need of the Marine Corps in California and the West Coast. It was laid out in a series of “camps” and “ranges” in which Marine could reside and be trained in the use of all types of weapons. It was also fitted with a substantial Naval Hospital, a Naval Ammunition Depot, an airfield, and other important facilities. The Naval Ammunition Depot at Fallbrook adjoins Camp Pendleton, but is administered directly by the Navy. World War II-era construction at Camp Pendleton was especially temporary in character. For several years, the bulk of the young Marines resided in tent camps, which were gradually replaced by massive Quonset hut villages. In constructing

more permanent, but nonetheless technically temporary, barracks and other buildings, the Marine Corps specified that the buildings be constructed “as quickly and cheaply as possible, using standard Army type structures with a minimum of refinements.”⁵³ By the end of the war, Camp Pendleton was home to 86,749 Marines, sailors, and civilians.

The architectural character of Camp Pendleton during World War II was essentially similar to the fast-growing Army training bases such as Fort Ord, Camp Roberts, and Fort Hunter Liggett. Two factors, however, set it apart from the Army bases. First, it was the headquarters for the Marine Corps in the West and was fitted with command buildings not found on most Army bases. Second, the Navy (the contract was handled by the Navy for the Marine Corps) hired Myron Hunt to design many of the buildings there. While the Hunt-designed buildings at Camp Pendleton lack the sophistication of his earlier work at March Field, some of these buildings are distinctive within the context of World War II-era temporary construction and design.

7.3.1 Property Type: Navy and Marine Corps Amphibious Training Bases

The two major amphibious training bases (NAB Coronado and Camp Pendleton) are very different from one another, chiefly because Camp Pendleton was far more than an amphibious training base. The amphibious training facilities required two things: a beach and a place for sailors or Marines to stay while they were training. The training exercises required few permanent buildings; indeed, the nature of the training made it impossible to have buildings in the immediate vicinity.

Examples:

- *NAB Coronado*—World War II-era buildings have been comprehensively inventoried; none appear to meet the criteria for listing in the National Register.
- *Camp Pendleton*—A comprehensive inventory of all buildings and structures has been completed. This inventory found that six buildings appear to meet the criteria for listing in the National Register. All six buildings (Buildings 1133, 1261, 1645, 1657, 1671, and 51811) were designed by Myron Hunt or by Hunt in collaboration with other architects (Chambers and Ellingwood) and are distinctive architecturally as well as functionally.

Registration Requirements

Despite the importance of amphibious training to the strategy for the naval war in the Pacific, very few amphibious-related buildings or structures appear to qualify for listing in the National Register. The reasons are to be found in the specific facilities that were built for this purpose.

⁵³ Quoted in: Robert M. Witty and Neil Morgan, *Marines of the Margarita: The Story of Camp Pendleton and the Leathernecks who Train on a Famous California Rancho San Diego*: Frye & Smith, 1970), 68.

The NAB was an auxiliary facility to the much larger Navy stations, scattered throughout San Diego. It was fitted with barracks and mess halls for temporary residence for the men being trained there but was not built to permanent standards. Camp Pendleton surely was seen as a permanent base, i.e., one that would be useful to the Marine Corps after the war was over. The Navy and Marine Corps planners, however, faced the staggering task of building facilities for nearly 100,000 people. In this respect, they were operating in the same frenzied mode of the Army designers of Camp Roberts, Fort Ord, Fort Hunter Liggett and the other “instant city” bases. The vast majority of the Camp Pendleton buildings were built to temporary standards, including a host of Quonset huts and other prefabricated buildings (see Figure 28).

There are a few buildings at Camp Pendleton that appear to qualify for the National Register. All are in the “Main Site,” an administrative and residential complex near the southern end of the base. No eligible buildings are located in the amphibious training area. Similarly, none of the buildings or structures at the NAB appear to qualify for listing in the National Register.

It is likely that all examples of this property type are still owned by DoD, at NAB Coronado and Camp Pendleton. The buildings and structures at both bases have been comprehensively inventoried and evaluated. It is unlikely that any additional properties associated with this theme will meet the criteria for listing in the National Register, for reasons discussed above.

7.4 THEME 4: MASSIVE SUPPLY AND AMMUNITION DEPOTS

The supply depots performed a seemingly prosaic, but nonetheless highly important role during World War II. Arguably, America and the Allied Forces won the war as much on the basis of their vast production capabilities as on the size of their armed forces. The great production capability was of little use, however, without an effective network for storing, sorting, and sending that material overseas. As the shipping-off point for most of the material headed to the War in the Pacific, California became the site of a disproportionate number of supply and ammunition depots for both the Army and Navy.

One aspect of the Army’s supply depot network is deserving of further investigation: the development of new warehousing methods during the war. As discussed below relevant to the Navy’s supply depots, the military was quite innovative in developing new methods for the storage and movement of goods. Before World War II, virtually all cargo was stored in pieces, requiring men to unload, store, and reload cargo one piece at a time. During the war, the military experimented with palletization and containerization methods, and ultimately selected palletization as the preferred method. Under palletization, cargo is stored on pallets from the point of manufacture. It is warehoused and shipped on the same pallet and not broken down until

it reaches the point of use. Containerization uses the same concept, except goods are stored in larger containers, which serve not only as a means of storage but as a means of transportation well. This innovation took hold in the civilian world after the war, although containerization would ultimately prevail in civilian as well as military warehouses.

7.4.1 Property Type: Army Supply Depots

The Army supply system—the province of the Quartermaster Corps—was built around a major shipping point, or Port of Embarkation, linked to numerous inland depots.⁵⁴ The focal point of the system at the start of World War II was the San Francisco General Depot at Fort Mason in San Francisco, which also served as the Port of Embarkation. This major depot constituted the only major supply depot at the start of the war. As the nation prepared for war and during the war itself, the Army fanned out across the northern half of the state with a series of depots in Lathrop, Tracy, Oakland, and Sacramento.

Examples:

- *Major Army depot at Fort Mason, San Francisco*—Listed in the National Register as an historic district, but no longer DoD-owned.
- *Sharpe Army Depot*—Most of the installation inventoried; no buildings found to qualify for listing in the National Register.
- *Oakland Army Depot (now Oakland Army Base)*—Determined eligible for listing in the National Register as a historic district.
- *Sacramento Army Depot*—Inventoried and evaluated; no buildings found to qualify for listing in the National Register.
- *Tracy Facility (now Defense Distribution Depot San Joaquin (DDJC), Tracy)*—Inventoried and evaluated; no buildings or structures found to qualify for listing in the National Register.

Registration Requirements

Of the five facilities of this sort, two have been found to qualify for the National Register: Fort Mason and the Oakland Army Base. Fort Mason was found to qualify as a historic district; one that includes buildings and structures from the Civil War through World War II. These two as bases represented the core assets of the Army's supply network; the inland depots supported the larger bases in San Francisco and Oakland. The inland depots have either closed or realigned to serve DoD generally, rather than a single branch.

⁵⁴ The Quartermaster Corps' system is outlined in Erna Risch, *The Quartermaster Corps: Organization Supply, and Services*. Washington, DC: Center of Military History, 1995.

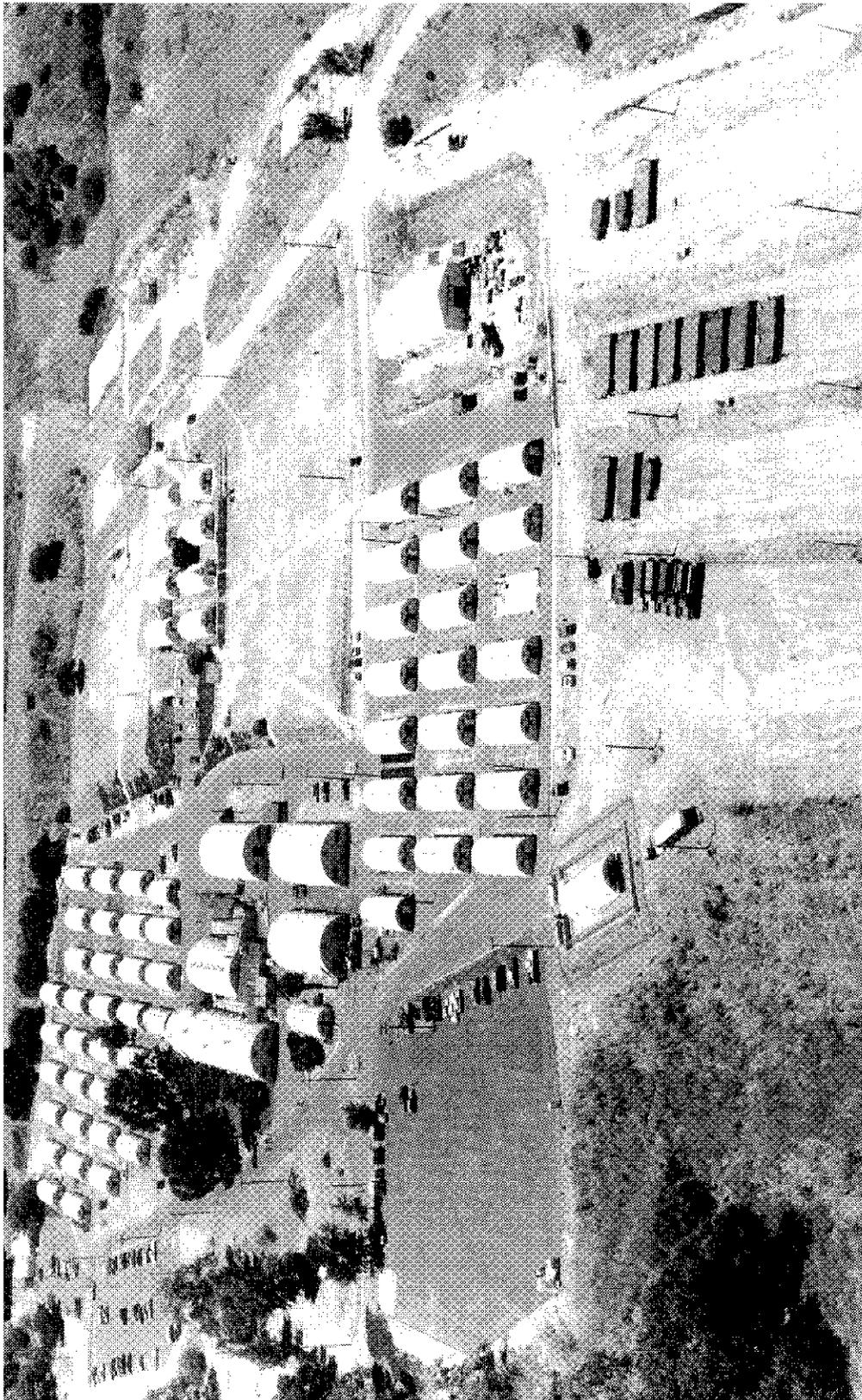


Figure 28. Quonset hut village at Camp Pendleton. Although the center for Marine Corps activities on the West Coast, Camp Pendleton was not fitted with a large number of permanent buildings until the end of World War II. For most Marines, home at Camp Pendleton was a wooden temporary building or a Quonset hut. (Source: The National Archives.)

As mentioned above, one aspect of the Army's supply depot network is deserving of further investigation: the development of methods for the storage and movement of goods. This theme has been studied extensively in Navy inventories; the Naval Supply Annex in Stockton was found to qualify for the National Register specifically because it was built to handle palletization methods. It does not appear that this important sub-theme has been investigated with respect to Army facilities; it is not known whether the Army pursued the same innovations as the Navy.

7.4.2 Property type: AAF Supply Depots

The AAF depots during World War II were principally repair and storage facilities for aircraft parts. It appears that the Army's Quartermaster Corps handled routine supply depot functions for the AAF. The two facilities that were identified as Air Depots (McClellan AFB and Norton AFB) were essentially repair depots, more akin to a shipyard than a supply depot.

Examples:

- *McClellan AFB (formerly Sacramento Air Depot)*—Historic district listed in the National Register.
- *Norton AFB*—Inventoried, but no buildings or structures were found to qualify for the National Register.

Registration Requirements

Available evidence indicates that there were only two AAF depots in California; McClellan and Norton. Both have been inventoried and evaluated. The historic district at McClellan AFB is built around pre-war buildings and structures; only a few wartime buildings are included therein. The Norton AFB inventory found that none of the wartime buildings or structures qualify for the National Register. It is unlikely that any more examples of this property type will be identified on DoD installations in California. In addition, Norton has closed and McClellan will close soon. Therefore, no registration requirements are needed for this property type.

7.4.3 Property Type: Navy and Marine Corps Supply Depots

At the time of the attack on Pearl Harbor, there was one Navy supply depot in California (the so-called "Broadway Complex" in San Diego) and one small Marine Corps supply depot in San Francisco. The expansion of the Navy's supply depot network during the war was one of the most dramatic developments in the history of the military in California. By the end of the war, the Navy had major supply depot assets throughout northern California and the San Diego area, while the Marines had a major supply depot in the Mojave Desert and a smaller depot in San Francisco.

The most important new supply depot was the Oakland Supply Depot, built on the Oakland waterfront alongside the Oakland Army Base. (The Navy's facility was actually built before the Army's.) It was soon joined by a major annex on Rough and Ready Island in Stockton. These two facilities formed the core of the supply depot network. They were joined by minor or specialized facilities, including the old supply depot in San Diego, an annex in Alameda, Marine Corps supply depots in the desert community of Barstow and in San Francisco, and the specialized Seabee depot in Port Hueneme.

Examples:

- *NSD Oakland (now FISC Oakland)*—Determined eligible for listing in the National Register as an historic district.
- *Naval Supply Annex, Stockton (now Naval Communication Station [NCS] Stockton)*—Determined eligible for listing in the National Register as an historic district.
- *NSD San Diego*—Listed in the National Register.
- *Marine Corps Logistics Base, Barstow*—Inventoried and evaluated; no buildings found to qualify for the National Register.
- *Naval Construction Battalion Center (CBC), Port Hueneme (Seabee supply depot)*—Some buildings inventoried and evaluated; very few found to qualify for the National Register.
- *Alameda Annex, Alameda*—Inventoried and found not to qualify for the National Register.

Registration Requirements

Two Navy supply depot facilities have been found to qualify for the National Register as historic districts: the Oakland Supply Depot (FISC Oakland), and the Naval Supply Annex Stockton (NCS Stockton). The Oakland depot was found to qualify under Criterion A, for its important role in the Navy's war effort. The Stockton Annex was found to qualify under Criteria A and C, for its innovative role in the Navy's adoption of palletization methods for cargo handling. The Stockton Annex was the first military facility to be built entirely for the purpose of handling cargo in this manner. Under palletization, cargo is stored on pallets from the point of manufacture. It is warehoused and shipped on the same pallet and not broken down until it reaches the point of use. Containerization uses the same concept, except goods are stored in larger containers, which serve not only as a means of storage but as a means of transportation as well.

The other supply depots or annexes played only minor roles in the history of this theme. The one exception is the Marine Corps depot at Barstow, which was a key facility for the Marines. It was inventoried but no buildings or structures were found to qualify for the National Register.

Almost nothing is known about the Marine depot in San Francisco, not even its location. It is unlikely that the facility is still DoD property.

7.4.4 Property Type: Fuel Depots

Fuel depots are specialized elements of the supply network. The Navy built several fuel depots in California during World War II. The fuel farm on Point Loma pre-dated World War II, but was expanded during the war. The fuel depot at Point Molate in Richmond (north of Oakland) was developed during World War II. The Point Molate depot was built at the grounds of Winehaven, a major early 20th century winery complex that closed in the early 1920s, with the onset of Prohibition. Surprisingly, the Navy's fuel depot operations did not require demolition or alteration of the winery buildings. The winery buildings were used for storage, while the company housing units were used for housing. Winehaven is listed in the National Register, but for its association with the wine industry, not for its use as a fuel depot.

Examples:

- *Naval Fuel Depot Point Molate*—Determined eligible for the National Register, but excluding World War II buildings. The eligible properties predate the Navy's use of this land; Navy fuel tanks and buildings are treated as intrusions.
- *FISC Annex Point Loma (built as the Naval Fuel Depot)*—Inventoried, but properties not evaluated definitively; found to be "potentially eligible" as part of an undefined National Register historic district.

Registration Requirements

The two Navy fuel depots have been inventoried and evaluated. The facility at Point Molate has been found to qualify for the National Register for its association with the wine industry. The World War II fuel depot facilities are treated as intrusions within the wine-related historic district. The Fuel Depot at Point Loma has been inventoried, but none of the World War II facilities were found to qualify for listing on the National Register. The facility is a BRAC closure and is expected to be transferred to the City of Richmond, California, in the near future.

Buildings and structures at Point Loma should be evaluated using the three criteria that are most useful in evaluating World War II properties: directness of association with important events; rarity; and integrity. The facility at Point Loma includes buildings other than the fuel tanks but the tanks represent the core of the base. Can a case be made for specific associations between any one of the tanks, or the tanks generally, and the war in the Pacific? Do the tanks represent

innovations in the storage and distribution of naval fuel? These questions should govern the evaluation that needs to be accomplished regarding the World War II-era properties at FISC Point Loma.

7.4.5 Property Type: Ammunition Depots

The pre-war buildup and particularly the war effort itself accelerated the need to store all types of material, but none more so than ordnance. Of the various branches, the Navy was especially concerned about munitions storage, recognizing the likelihood that the war in the Pacific would be principally a Navy war.

In the late 1930s, the military had limited munitions storage capacity in California. For obvious reasons, ammunition could not be stored at the usual dockside locations that were most useful for ordinary supply depots. The Army had its old arsenal buildings at Benicia, while the Navy had a large ammunition depot at Mare Island. In addition, there were minor, short-term ammunition storage capacities at most of the sizable installations throughout the state. Throughout the war, the military acquired and built out very large ammunition depots throughout the state. Most of these were in coastal locations; although, in a few instances, the depots were built in very remote locations.

Magazines are similar to World War II-era temporary buildings in that they were built on standardized plans and designed for rapid and inexpensive construction. They differ, however, in that they were necessarily built to last because of the need to provide blast protection. In terms of design, however, magazines are arguably the most standardized products to have been built during the war. The differences between Army and Navy magazines, while present, are not important from the standpoint of design.

Both the Army and Navy developed new magazine designs during World War II. The major innovation—the arched magazines—was used commonly by both branches.⁵⁵ Commonly called an “igloo” magazine by both branches, the development was important, not as a new technique for safe storage, but because it was quick and inexpensive to construct. These arched, earth covered magazines account for a very large percentage of existing World War II-era magazines.

Examples:

- *Benicia Arsenal*—Determined eligible for the National Register, but excluding World War II buildings.

⁵⁵ The development of magazine design is discussed at length in a national context: R. Christopher Goodwin & Associates, “Support and Utility Structures and Facilities (1917-1946). Overview, Inventory, and Treatment Plan,” May 31, 1995.

- *Sierra Army Depot*—Inventoried and found not to qualify for the National Register.
- *NAD Mare Island*—World War II-era buildings included within the historic district and listed in the National Register.
- *NWS Concord (NWS, Seal Beach, Detachment Concord)*—Inventoried and found not to qualify for listing in the National Register.
- *Fallbrook Ammunition Depot (NWS Seal Beach, Detachment Fallbrook)*—Inventoried and evaluated in 1997 and found to qualify for listing in the National Register as an historic district.
- *Navy Depot Seal Beach (NWS Seal Beach)*—Inventoried and found to qualify for listing in the National Register as an historic district.

Registration Requirements

Ammunition depots, whether Army or Navy, represent perhaps the single most problematic property type from World War II, in terms of inconsistency of treatment. Ammunition depots are, by their nature, fundamentally the same from one plant to the next. It is reasonable to expect that these fundamentally similar properties would be treated in like fashion. The record, however, suggests otherwise. The Navy magazines at Fallbrook, Seal Beach, and Concord are essentially the same, with roughly the same number and types of magazines in each facility. The magazines at Concord, however, were found to be ineligible, both individually and as a potential historic district, while the magazines at Fallbrook and Seal Beach were found to qualify for the National Register as historic districts.

Not only is there a disparity in eligibility determinations, but the applicable eligibility criteria also differ. The two large historic districts were found to qualify for the National Register under Criterion A for their association with the war effort, and Criterion D, for their ability to convey construction methods.

Again, three overarching considerations should govern evaluation of these magazines: directness of association with important events; rarity; and integrity. Although built rapidly and inexpensively during World War II, the magazines are not rare. They were built to such high standards that hundreds of them are still in use. They do generally retain integrity. Can the case be made that these magazines are directly associated with events important to our history (National Register Criterion A)?

7.5 THEME 5: EXPANDED SHIP REPAIR AND PRODUCTION WORK

Naval shipyards have existed since the early 19th century. In some respects, these shipyards presaged the activities of other government-owned production facilities during World War II.

The nationwide context on government-owned production facilities lists the shipyards, as well as the AAF repair facilities, within the broader category of Government-Owned, Government-Operated (GOGO) operations.⁵⁶ This treatment is a matter of interpretation; certainly the shipyards were engaged in ship production as well as ship repair, but the long tradition of Navy shipyard operations, dating to the early 19th century, represents a special example of a government-owned production capability.

7.5.1 Property Type: Shipyards

The old shipyard at Mare Island was never busier than it was during World War II. Also during the war, the Navy acquired the private shipyard at Hunters Point in San Francisco and expanded the small shipyard in Long Beach. It also added shipyard capabilities at the Naval Station, San Diego. Thus, by the end of the war, the Navy had four operating shipyards: in Vallejo, Long Beach, San Diego, and San Francisco.

Examples:

- *Mare Island Naval Shipyard*—Listed in the National Register as a historic district, including World War II-era properties.
- *Hunters Point Shipyard*—Inventoried and most World War II-era properties found not to qualify for listing in the National Register. The major World War II-era dry dock (Dry Dock 4), however, was found to qualify.
- *Naval Shipyard Long Beach*—Inventoried and evaluated; no World War II-era properties found to qualify for the National Register. World War II-era buildings at Roosevelt Base were located on the Naval Station, Long Beach.
- *Naval Station San Diego, Dry Dock 1*—Found to qualify individually for listing in the National Register.

Registration Requirements

A shipyard is essentially a factory, although it can have properties unrelated to the factory operations. Mare Island, for example, was primarily a shipyard but included many other functions as well. This was true during World War II, as it had been for nearly a century before. The Hunters Point shipyard, by contrast, included only the industrial area, along with allied structures, such as warehouses, cafeterias, and so forth. The Long Beach facility was closely

⁵⁶ Government-owned and government-operated industrial operations were important nationally but of lesser importance in California. This subject is treated in a national context: Dr. Philip Shiman, "Forging the Sword: Defense Production during the Cold War," USACERL Special Report 97/77, July 1997. Despite its name, the study also deals with World War II. The two major classes of plants were Government-Owned Government-Operated (GOGO) and Government-Owned Contractor-Operated (GOCO).

linked with other Navy facilities in the area. The dry dock and repair facilities at Naval Station, San Diego were also linked to an emerging multiple-purpose station.

It is unlikely that any World War II-era shipyards will be identified, other than Mare Island, Hunters Point, Long Beach, and Naval Station, San Diego.

7.6 THEME 6: TESTING SITES FOR EMERGING WEAPONS AND AIRCRAFT

Military research, development, testing and evaluation (RDT&E) would represent a major mission of California bases during the Cold War. For this reason, RDT&E themes dominate the following chapter, dealing with the Cold War. The seeds of the high-technology military in California, however, were planted during World War II.

In the late 1930s, when it was clear to many that America would soon be involved in World War II, American military leaders turned to the university system to begin intensive research on several promising tools of war, about which only the basic qualities were known. These technologies included radar, sonar, nuclear fission, rocketry, and the proximity fuze. In 1940, the National Academy of Sciences urged the Federal government to organize a separate agency that would direct university research activities in a way that would maximize the contribution to the war effort. The government responded by creating, first, the National Defense Council and later the Office of Scientific Research and Development, to guide universities into the most useful lines of research.⁵⁷ California universities participated in these activities more than universities in other states, with the possible exceptions of schools in Massachusetts, New York, and Illinois. The California Institute of Technology in Pasadena and the University of California, Berkeley, were most active in these weapons programs.

The university-based research and development (R&D) and T&E took advantage of campus facilities, but quickly spread to industrial sites and military bases. California military bases were often used as test facilities and, in a few cases, as research laboratories for work by these universities. In addition, private industry often used military bases for the same purposes, as new weapons, aircraft, or other devices were being perfected. A small number of California military bases were also used as GOGO production sites for very exotic weapon parts and systems, for which there was no private industrial expertise or capacity. Some California bases came into existence for the express purpose of performing these R&D and T&E functions. These high-

⁵⁷ The history of the OSD is presented in: James Phinney Baxter, *Scientists Against Time*. Cambridge: MIT Press, 1968.

technology facilities would form the foundation upon which the technological leadership of California would be established during the Cold War.

The atomic bomb represents a special case within the larger context of experimental weapons that were developed during World War II. The atomic bomb was one of the most important and long-lasting effects of the American military effort during World War II. Californians were not extensively involved with the Manhattan Project but did play a peripheral role in some aspects of the huge program. As with all aspects of weapons R&D during the war, California universities played as big of a role as the military itself in work on the bomb; the University of California in Berkeley was especially active in this regard. It appears that only a few military bases in California were involved, directly or indirectly, with the Manhattan Project.

7.6.1 Property Type: Remote Weapons and Aircraft Test Stations

During World War II, the military began to set aside the first of the remote Mojave Desert installations, which today collectively represent an invaluable asset in terms of a secure test environment. The two best examples are NAWS China Lake (called Naval Ordnance Test Station, or NOTS, during the war) and Edwards AFB (called Muroc AAFB during the war).

In a sense, NOTS and Muroc were Cold War-type bases that were built during World War II. With most California bases, there was a radical difference between functions and buildings types, before and after 1945. NOTS and, to a lesser degree, Muroc were built up during the war with the thought that the bases would be needed after the war, continuing high technology research that was not completed in time to be used during the war.

Edwards was not initially established as a high-technology base; it was set aside in the 1930s as a bombing range for pilots at March Field. Permanent construction was initiated in 1939 and Muroc was identified as a major bomber training school. As early as 1942, however, the Army began to use the base to test experimental aircraft. It was suited for that purpose because it was a secure facility, but was relatively close to the large aircraft plants in Los Angeles and San Diego. Equally important, the base included the dry Rogers Lake bed, a massive playa that was quite useful for testing unpredictable aircraft. In August 1942, the XP-59A, the first American jet aircraft, was first tested there. This development would lead directly to the establishment of the Muroc Flight Test Center in 1946.

In addition, the AAF had contracted with the California Institute of Technology (Caltech) in Pasadena to work on the development of usable solid-propellant motors, capable of propelling a rocket or a jet-assisted take off device for conventional aircraft. Caltech had conducted its research for the AAF at the edge of Pasadena between 1940 and early 1945. In early 1945,

Caltech moved some of its test facilities to the isolated ranges at Muroc. Although little work was accomplished in the waning years of the war, the Caltech facility set the stage for development of the Air Force Research Laboratory at Edwards AFB during the Cold War.

The Navy's station at NOTS Inyokern (now NAWS China Lake) also came into being as a result of work at Caltech. In the early 1940s, the Navy had contracted with Caltech to pursue development of various small rockets, chiefly bombardment rockets. In 1940-1943, Caltech scientists conducted their basic R&D in Pasadena while testing their prototypes at Goldstone, in what is now Fort Irwin. The situation was unacceptable for several reasons. The R&D staff was far removed from the test facilities. In addition, the situation was potentially hazardous for the residents of Pasadena. In early 1944, the Navy began building a great new R&D and T&E site at the Inyo-Kern county line, near the small town called Inyokern.

The Navy facility at Inyokern was far more advanced than the AAF facility at Muroc, in terms of permanent facilities and the diversity of tests that were conducted there during World War II. Dozens of R&D and T&E properties at NAWS China Lake have been found to qualify for listing in the National Register. Of these, approximately half date to World War II and half to the Cold War. More than any other base in California, NAWS China Lake signifies the beginnings of Cold War research and testing during World War II. Figure 29 shows the Press Building at NAWS China Lake.

Examples:

- *NOTS Inyokern (now NAWS China Lake)*—Many World War II-era buildings determined eligible for the National Register.
- *Edwards AFB (Muroc AAFB)*—Inventoried; three hangars, a control tower, and an early static test stand, all dating to World War II, found to qualify for listing in the National Register.

Registration Requirements

Most of the World War II-era high technology properties at China Lake and Edwards have been inventoried. The bases are so huge and complex, however, that it is quite possible that additional World War II-era R&D and T&E facilities will be located in the future. It is also possible that other remote bases have high-technology components as well. For example, it is known that Caltech scientists used Fort Irwin for their experiments before they moved to China Lake. It is probable that other remote bases were used from time to time by university and industry scientists to test their emerging technologies.

The China Lake and Edwards studies lay the foundation for how examples of this property type should be evaluated. As with other World War II-era properties, the essential tests are: directness of association with an important event, rarity, and integrity. The early research and test facilities appear to be quite rare. The directness of association must be established on a case-by-case basis. Not every World War II-era resource at Edwards or China Lake meets this test, only those properties that were directly associated with important experiments. Integrity must also be established on a case-by-case basis.

Although important work has been accomplished at Edwards and China Lake, the R&D and T&E programs on California military bases is a largely untapped research topic. It is quite likely that other properties will be inventoried, evaluated, and found to qualify for listing in the National Register on this basis.

7.6.2 Property Type: Other R&D and T&E Facilities

China Lake and Edwards were not the only California military bases that were used for R&D and T&E purposes during World War II. In 1940, the Navy contracted with the University of California, Los Angeles (UCLA) to conduct R&D and T&E on several promising areas of naval electronics, including radar and sonar. The Navy built a substantial laboratory facility for UCLA scientists on Point Loma, at the site of the old Radio School. This laboratory continued to grow until the end of the war. In 1945, the UCLA contract was terminated and the laboratory was renamed the Naval Electronics Laboratory (NEL). That facility has gone through several name changes and has merged with parts of the laboratory at NAWS China Lake; it is now called SSC San Diego.

Examples:

- *The NEL, now the SSC San Diego*—World War II properties have been inventoried, but not evaluated.

Registration Requirements

The World War II-era NEL properties have been inventoried but not evaluated. When these properties are evaluated, the registration requirement comments for China Lake and Edwards might prove useful. Specifically, directness of association, rarity, and integrity should be taken into consideration. It appears that a substantial number of buildings still remain from the World War II-era NEL. It is unlikely that every building there could meet these three tests. It is quite possible, however, that some of these buildings may qualify for the National Register, on the basis of direct associations with the important scientific work that was accomplished there during World War II.

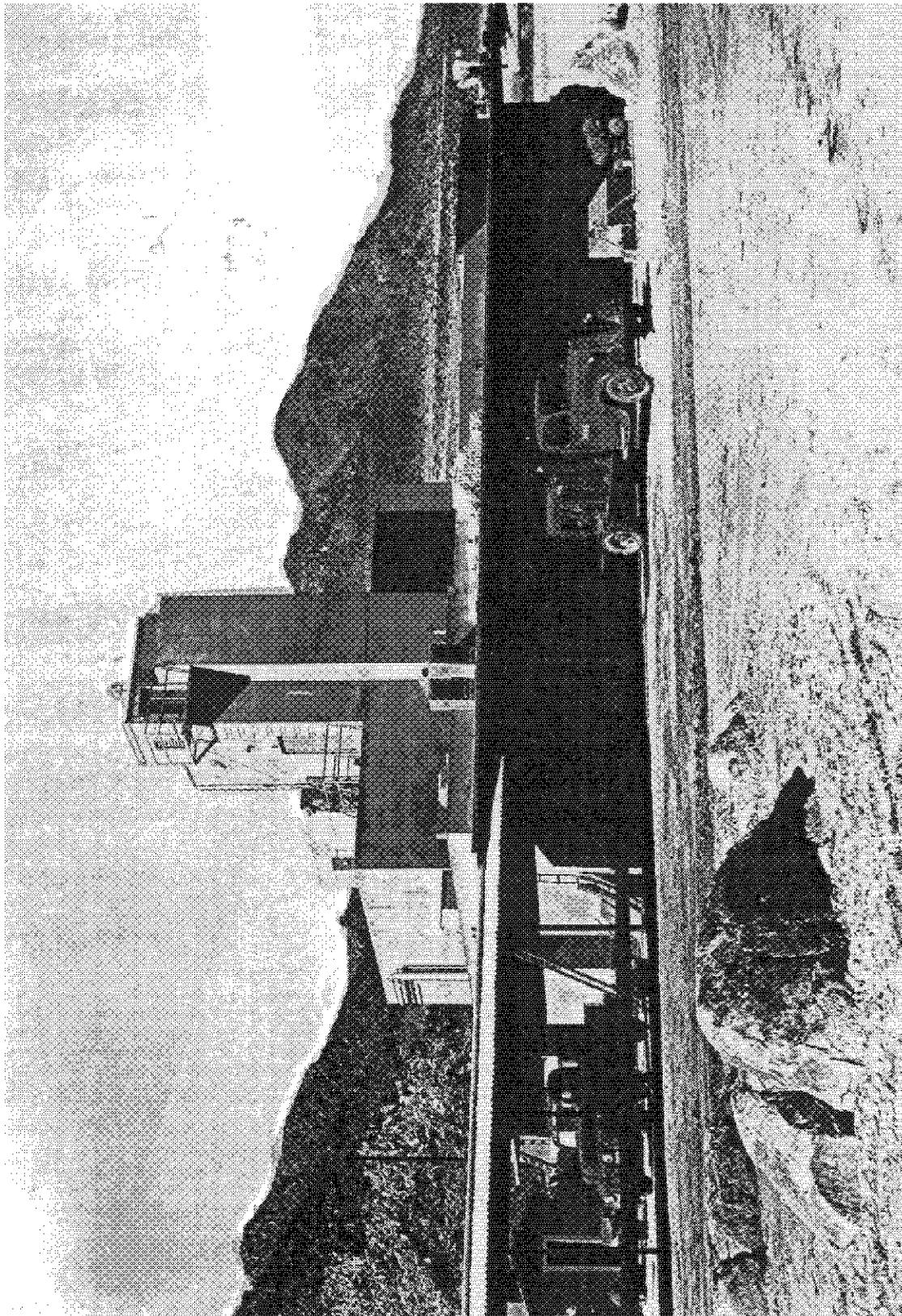


Figure 29. Press Building at NOTS Inyokern (now NAWES China Lake), November 1944. This building epitomizes the dictum "form follows function"; its sculptural form is simply the shape of the reinforced concrete needed to encase machinery to press propellant grains into rocket motors. These motors were used for test purposes and in rockets used by the Navy in Europe and the Pacific. (Source: The National Archives.)

The possibility exists that other California bases were used for weapons research and development during World War II, in ways not yet understood or recorded. Each branch and each base should pay special attention to this historic theme in evaluating buildings and structures. The World War II “laboratories” were often rather plain wartime temporary buildings. Few of these buildings will qualify for the National Register under Criterion C. They may very well qualify, however, under Criterion A, for their association with important weapons development and testing programs.

7.6.3 Property Type: Research Facilities Associated with the Manhattan Project

The Manhattan Project occupied the resources of military bases and universities throughout the United States. The story of that research has been told in greater detail in recent decades as long-classified material has been released. In general, the basic research leading to the bomb was conducted outside California. The one great exception was the Lawrence Laboratory at the University of California in Berkeley, named after the Nobel Prize winning physicist, Ernest Lawrence, whose work with cyclotrons made Berkeley a mandatory stop for all of the scientists nationwide who were working on the project. The research involved the electromagnetic separation of U-235 from uranium, as well as isolating plutonium. At its peak, the laboratory employed 1,200 people.⁵⁸

Examples:

- *Lawrence Laboratory at the University of California, Berkeley*—One Cold War-era building found to qualify for listing in the National Register.

Registration Requirements

This is a largely unexplored area of research and it is possible that many more buildings and structures exist on California military bases that were associated with the larger research program for the atomic bomb. These sites may be located on university lands, particularly in Berkeley or Pasadena. It is not out of the question, however, that these sites may be located on California military installations as well. The Manhattan Project was profoundly important in World War II and even more so in defining the Cold War. The project represents an excellent Theme Study for the NHL program as well as an excellent candidate for a nationwide historic context for military installations. There is no doubt that California military bases, universities, and industry will figure in any study of this sort.

⁵⁸ The role of the Lawrence Laboratory in the Manhattan Project is discussed in an excellent web-published book, William E. Johnson, et al, “Lawrence and His Laboratory,” www.lbl.gov/Science-Articles.

7.6.4 Property Type: Military Bases Involved with T&E of Atomic Bomb

Californians played a relatively small part in the testing phase of the Manhattan Project. The bulk of that work was accomplished in laboratories and government-owned facilities throughout the United States. One documented role was that of the NOTS Inyokern (modern NAWS China Lake). The Army, which controlled the Manhattan Project, was exploring various bomb shapes for delivery of a nuclear warhead. Most of this testing was conducted in Wendover, Nevada and in Utah. In late 1944 and early 1945, however, the Army initiated “Project Camel,” which was a testing program for non-nuclear dummy bomb shapes, to observe the trajectories of these very heavy and clumsy bombs. The dummies were dropped at China Lake itself and on the Salton Sea from planes that were stationed at China Lake.

In addition, the Navy built the Salt Wells Pilot Plant at NOTS Inyokern to manufacture the high explosive “lenses,” or specially-shaped conventional explosives that triggered the implosion on the “Fat Man,” the type of bomb dropped on Nagasaki. Although it does not appear that a NOTS-produced lens was used at Nagasaki, the Salt Wells facility contributed to the collective understanding of how to manufacture and machine these explosives for this purpose.

Examples:

- “*Camel Test Buildings*,” NOTS Inyokern (modern NAWS China Lake)—Determined eligible for listing in the National Register.
- *Salt Wells Pilot Plant*, NOTS Inyokern (modern NAWS China Lake —Built explosive lenses for tests on implosion bombs.
- *Salton Sea installations of Army and Navy*—Inventoried and found not to qualify for listing in the National Register.

Registration Requirements

This is a largely unexplored area of research and it is possible that many more buildings and structures exist on California military bases that were associated with the larger testing program for the atomic bomb.

The China Lake “Camel Test Buildings” offer some indication as to how such properties might best be evaluated, including a test for integrity. The Army built four buildings at the Navy base for the purpose of conducting drop tests of bomb shapes for the “Fat Man” implosion-type bomb that was ultimately dropped on Nagasaki. These tests did not involve the nuclear core but did include the high-explosive conventional armament that was used to set off the implosion. Three

of these buildings retain a good degree of integrity, suffering chiefly from abandonment. The fourth building has been too modified to warrant National Register listing.

The Salt Wells Pilot Plant at NAWS China Lake has been found to qualify for the National Register as a historic district. The plant is apparently unique in the national context, has strong and direct associations with the Manhattan Project, and retains a high degree of integrity. The high integrity is attributable in part to the massive concrete construction methods used there. The pilot plant buildings were a cross between a laboratories and bunkers or magazines. The buildings are widely spaced and hidden behind earthen and concrete blast protection walls to contain damage in the event of an explosion.

It is likely that other remote California bases (perhaps Edwards AFB or Fort Irwin) were used in this program as well. If other resources are found that may be linked to the Manhattan Project, these should be tested against the three major criteria of strength of association, rarity, and integrity. Evidence to date suggests that these resources are highly unusual. The questions then remain: how strongly were these resources associated with this program, and do they retain integrity to their appearance in the mid-1940s?

7.7 THEME 7: INTERNMENT OF JAPANESE-AMERICANS

On February 19, 1942, President Franklin Roosevelt signed Executive Order 9066, which directed the military to designate “military areas” from which “any or all persons may be excluded.” The order made no mention of Japanese Americans or California but the practical impact of the measure was the removal of Japanese Americans from the coastal areas of California and the Pacific Northwest.

The Executive Order was inherently military in its intent but was ultimately administered through a combination of military and civilian personnel. After experimenting with voluntary evacuation of Japanese Americans from the “military areas,” the Federal government decided upon a program of forced relocation to inland areas. Two major steps were involved: short-term “assembling” of the evacuees in coastal areas; and their longer-term detention in inland areas. This program resulted in the operation of two distinct types of facilities: “assembly centers” in coastal counties; and “relocation centers” in areas far removed from the Pacific Coast. The assembly centers were operated directly by the Army, while the relocation centers were operated by the War Relocation Authority (WRA), a civilian agency that was supported by armed guard from the Army.

7.7.1 Property Type: Assembly Centers

Assembly Centers were short-term assembly areas in which Japanese Americans were held until the more permanent WRA centers could be completed. There were 13 such camps throughout California, which were open for less than one year; there were also assembly centers in Washington, Arizona, and Oregon. These were typically located in established open areas, such as racetracks or fairgrounds. Because there were more Assembly Centers than Relocation Centers, the populations at the Assembly Centers was smaller, usually about 3,000 to 4,000 people per center. The center at Santa Anita Racetrack in southern California was an exception; it housed more than 18,000 people for 8 months.

Examples:

- *Few of the Assembly Centers were on land that was, or is now, a military base*—The Engineering Field Activity West (EFA West) Navy complex in San Bruno is across the street from what was the Tanforan Race Track, which was used as an Assembly Center. It does not appear, however, the land now occupied by EFA West was used for this purpose. The Walerga Assembly Center north of Sacramento was reused as Camp Kohler, a minor adjunct facility for McClellan AFB. The Assembly Centers are California Historic Landmarks.

Registration Requirements

It is unlikely that any examples of this property type will be identified on lands controlled by DoD. There were only 13 centers and it does not appear that any of the centers were on land that is now controlled by DoD, other than the Camp Kohler property, which will soon be transferred to a local government, following BRAC closure of McClellan AFB. All of the Assembly Centers are California Historic Landmarks.

7.7.2 Property Type: War Relocation Centers

There were ten War Relocation Centers nationwide, two of which were in California: Manzanar in Inyo County and Tule Lake in Modoc County. The War Relocation Centers were administered by WRA, but included barracks for Army troops. As noted, the Army supplied armed guards for the centers. The centers were disbanded before Victory over Japan (V-J) Day, except for Tule Lake, which operated even after war was over. The land for the Tule Lake centers was sold or given away shortly after the center was closed. Manzanar was built on land owned by the City of Los Angeles and reverted to the city when the center closed. Part of that land is now administered by NPS, commemorating this event. DoD now owns no part of either camp. The camps were built around temporary wooden barracks, not unlike those in Army cantonments. Very few buildings remain from either camp.

Examples:

- *Tule Lake Relocation Center*—One building determined eligible for listing in the National Register.
- *Manzanar Relocation Center*—Listed in the National Register and as a NHL.

Registration Requirements

It is highly unlikely that any more examples of this property type will be identified on lands controlled by DoD. There were only two such camps in California and there are no military bases anywhere near either of them. Both Relocation Centers are California Historic Landmarks. Manzanar is a NHL and is owned by NPS.

7.8 THEME 8: POW CAMPS

California, like many other states, played host to thousands of POWs from Europe and Asia alike, although it appears that the bulk of prisoners held in California were Germans or Italians. These prisoners were held in large military bases as well as small installations in farming regions, where they often worked as agricultural laborers.

7.8.1 Property Type: POW Camps on Military Bases

It is likely that there were POW camps on military installations throughout California. Several such camps are known to have existed: at Naval Supply Annex, Stockton (now NCS Stockton), Vandenberg AFB, Beale AFB, NAB Coronado, and Sharpe Army Depot. It is likely, however, that many more such camps existed in California. The question remains, however, as to whether there are physical remnants from any of these camps. The only known resources that have been found eligible for listing in the National Register are stone-lined drainage canals at the Naval Supply Annex, Stockton, which bear inscriptions that they were built by German POWs in 1946. That date is intriguing; the camps apparently were kept open longer than is commonly thought. The Beale AFB camp was also open through July 1946.

Examples:

- *Stonework at Naval Supply Annex, Stockton (NCS Stockton)*—Inscribed as having been completed by German POWs. Included as a contributing element of an historic district.
- *Camp Cooke (now Vandenberg AFB)*—Used as a POW camp. No resources have been identified.
- *Sharpe Army Depot*—Used as a POW camp. No resources have been identified.

- *Beale AFB*—Site of a 3,000 person German POW camp. It was fitted with some permanent buildings. One permanent building still exists; it was inventoried and found not to qualify for listing in the National Register.
- *NAB Coronado*—Numerous German POW barracks still exist, but were found not to qualify for the National Register because they have been modified.
- *Angel Island*—Used as a POW camp. Some buildings from this period apparently still remain.
- *DDJC (Tracy Site)*—Had a German POW camp. Properties inventoried and found not to qualify.
- *Benicia Arsenal*—Had a German and Italian POW camp. Some prisoners died there and were buried in the cemetery at the arsenal.

Registration Requirements

This is a largely untapped area of research, inventory, and evaluation. It is likely that there were many POW camps in California. The little work that has been accomplished to date suggests that Italian and German prisoners rather than Japanese prisoners were sent to the California camps. One possible reason for the lack of inventory and evaluation efforts is that there are no physical remnants, because the prisoners were kept in tent camps rather than permanent or even wartime temporary buildings. The extant barracks at NAB Coronado suggest that POW barracks were not unlike barracks used by Navy personnel. It is impossible to draw reliable conclusions, however, from this one example. The one remnant building at Beale AFB appears to have been used as a detention center, a kind of jail within a prison.

Given the general absence of resources, it is likely that an intact or reasonably intact building or group of buildings from a POW camp would be regarded as a rare property and would warrant serious consideration for listing in the National Register. Eligibility would likely be based entirely upon historical associations and not on architectural merit; POW camps were likely given minimal design consideration except for security purposes.

7.9 THEME 9: HISTORICALLY SIGNIFICANT CIVILIAN BUILDINGS TAKEN OVER BY THE MILITARY DURING WORLD WAR II

7.9.1 Property Type: Historically Significant Buildings Taken Over by the Military During World War II

In the great rush to acquire property for new and expanded bases, the government came into the possession of numerous historically significant civilian properties. The nature of these properties varied greatly, unified only by the fact that the government acquired them for military uses. Many of these were sold as surplus after the war, although many are still in the possession of the

military. Virtually all of the non-military properties on military bases that qualify for listing in the National Register were acquired during World War II. The diversity of these older buildings reflects the essentially random manner in which the resources were acquired.

Examples:

- *Old Hotel Del Monte (now the Naval Postgraduate School), Monterey*—Eligible for listing in the National Register.
- *Norconian Club, Norco. Nomination pending for National Register*—Taken over by the Navy as a hospital; now used by the State of California as a prison.
- *Las Flores Adobe and Santa Margarita Ranch House*—Listed in the National Register; taken over as part of Camp Pendleton.
- *Hearst Hacienda and Gill Adobe, Fort Hunter Liggett*—Listed in the National Register.
- *Berylwood, the Thomas R. Bard Estate*—Consists of the Thomas R. Bard House (Officers' Club), Richard Bard House (Quarters A - Commanding Officer's residence), guest house, tennis courts, garage, and gardener's tool shed. Listed in National Register, now on the grounds of CBC Port Hueneme.
- *Winehaven*—Listed as an historic district, built around the 1907 winery complex; taken over as part of Naval Fuel Depot, Point Molate.
- *Nacimiento Ranch House*—Determined eligible for the National Register, located on Camp Roberts.

Registration Requirements

These historic properties were acquired by DoD more or less by accident, because they existed on land that was needed for military base expansion. The proper contexts for evaluating significance and integrity for these buildings are the contexts in which the buildings were constructed, not this accidental acquisition for military purposes. The properties are important to the military as rare and usually very old historic resources, but their significance is best evaluated in the civilian context in which they were built.

7.10 THEME 10: MILITARY HOSPITALS

Although there was a tremendous need for long- and short-term medical care during World War II, the military for the most part made do with hospitals that existed in late 1941. Some of these older hospitals were expanded and a few entirely new facilities were built. Even some of the new hospitals took form by reusing older civilian buildings, whether or not the civilian buildings were constructed as hospitals. In Oakland, for example, the Oak Knoll golf course was made into a Naval Hospital, as was the Club Norconian resort in Corona. New hospitals were built on some

of the new bases, including a substantial Naval hospital in the Marine Corps base at Camp Pendleton.

7.10.1 Property Type: Naval Hospitals

The Navy made huge investments in its hospital system before and during American involvement in World War II. Navy hospitals from this period fall into three categories. The largest and most important facilities were freestanding hospitals, i.e. hospitals not connected with any other Navy stations. The second most important group includes the major hospitals that were located on Navy stations that had non-hospital missions, such as shipyards or training stations. Finally, every sizable Navy facility had some type of dispensary or small medical clinic.

The major freestanding Navy hospitals were those in San Diego, which pre-dated the war, as well as the large wartime hospitals in Oakland, Corona, and Long Beach. There was a very substantial hospital complex at the shipyard at Mare Island, which long pre-dated the war, and a major naval hospital at the Marine Corps base at Camp Pendleton.

There are vast differences in the architectural character of the late 1930s hospital construction, versus that of the wartime years. Pre-war hospital construction, like pre-war construction generally, was permanent in nature and generally conformed to the architectural character of buildings in the vicinity. This was true of the work at the older hospital at Mare Island and in San Diego. Wartime construction, by contrast, was typically not built to be permanent. Wartime hospitals, in short, were simply variations on wartime temporary buildings. They were larger and more complex than barracks or mess halls, but nonetheless typical of World War II-era temporary construction.

Examples:

- *Naval Hospital at Camp Pendleton*—Inventoried and evaluated; no buildings found to qualify for listing in the National Register. The wartime hospital no longer exists.
- *Naval Hospital, Corona, now divided between the State of California, Navy, and Army Reserves*—A pre-war hotel, owned by the State of California, has been nominated for listing in the National Register. A part of the Army Reserve property inventoried and found not to qualify for the National Register. Navy property not inventoried.
- *Naval Medical Center, Long Beach*—Determined not to qualify for the National Register.
- *Naval Hospital, Oak Knoll, Oakland*—Inventoried and evaluated and none of the properties were found to qualify for listing on the National Register.
- *Expansion of the Navy Hospital at Mare Island in the late 1930s*—These additions are contributing elements of the Mare Island Historic District.

- *Expansion of the Naval Hospital San Diego in the late 1930 and 1940s*—The pre-war buildings are treated as contributing elements of the historic district; wartime buildings are not.

Registration Requirements

A clear pattern has been established concerning the National Register eligibility of wartime Navy hospitals. The late 1930s additions to existing hospitals at Mare Island and San Diego have been found to qualify for the National Register as contributing elements of historic districts. All of the wartime hospitals and World War II-era expansions, by contrast, have been found not to qualify for the National Register. The reason for this disparity is to be found in the nature of the construction there. The wartime hospitals and hospital additions were temporary in nature. This fact is significant in two regards. First, the buildings were undistinguished architecturally when compared with the pre-war hospitals. Second, the hospitals were not built to last. The entire hospital at Camp Pendleton, for example, has been replaced with a modern, seven-story hospital, built in 1974. Similarly, a major portion of the temporary Naval Hospital at Oak Knoll was replaced with a multi-storied modern hospital building. Unfortunately, this new building was constructed on a major earthquake fault and could not be seismically improved to meet current hospital standards, and therefore has been closed and will soon be disposed of. The World War II-era temporary hospitals that have survived have done so only because they have been substantially upgraded.

7.10.2 Property Type: Army Hospitals

Contrasted with the Navy, the Army made a surprisingly small expansion of its hospital system in California during the World War II years. The Army did expand Letterman Hospital at the Presidio of San Francisco; Letterman was already one of the largest military hospitals before the war began. The Army built a second general hospital in Santa Barbara, called Hoff General Hospital. Little more is known about this facility, except that it was located near the corner of Las Positas and State Street and that it was demolished shortly after the conclusion of the war.⁵⁹ There were, of course, smaller dispensaries associated with each of the major Army bases.

Examples:

- *Expansion of Letterman Hospital, Presidio of San Francisco*—Listed in the National Register as an historic district.

⁵⁹ The hospital is mentioned in: Warren A. Beck and Ynez D. Haase, *Historical Atlas of California*. Norman: University of Oklahoma Press, 1974). The existence of the hospital was confirmed through conversations with the Santa Barbara Historical Society.

- *Hoff General Hospital, Santa Barbara*—Not inventoried or evaluated. Apparently, little or nothing remains from this hospital.

Registration Requirements

It appears that there were only two Army general hospitals in California: Letterman and Hoff. Letterman was listed in the National Register with the remainder of the Presidio of San Francisco Historic District. It appears that little or nothing remains from Hoff General Hospital. Although it is possible that other resources will be identified, available evidence suggests that there are no other properties that exemplify this property type. Therefore, no registration requirements are provided for this property type.

7.11 THEME 11: WORLD WAR II COASTAL DEFENSE

The World War II-era gun emplacements represent the last major group of coastal defense batteries installed in California. The surprise attack on Pearl Harbor raised the prospect that the Pacific Coast of California could be vulnerable to attack by the Japanese Navy, whether by aircraft from aircraft carriers or by battleships that might bombard the coast from afar. This fear resulted in construction of some of the most impressive coastal defense batteries ever built.

The World War II-era coastal guns were of two basic types: huge 16-inch guns, meant to be used against battleships standing offshore; and anti-aircraft guns. The 16-inch guns, which were installed in San Francisco and San Diego, were monster (39-ton) guns, mounted on large concrete foundations. The anti-aircraft batteries were chiefly three-inch guns, mobile or mounted permanently, and attached to the larger gun batteries.

7.11.1 Property Type: Coastal Defense Batteries

The World War II-era batteries were at once similar to their predecessors and reflective of technological innovations. The guns were mounted in the general manner of the Taft-era batteries. The three innovations were: the use of much larger guns, requiring correspondingly larger emplacements; the installation of anti-aircraft guns in some locations; and the use of radar at a few sites.

Examples:

- *Fort Emory Coastal Battery on Naval Radio Receiving Facility, Imperial Beach*—Determined eligible for listing in the National Register.
- *Numerous batteries on Point Loma*—Determined to be a contributing elements of a coastal defense multiple property evaluation for Fort Rosecrans-related batteries, which include pre-World War II batteries as well.

- *Various World War II-era batteries in Forts Baker, Barry, and Cronkhite in Marin County.* Listed in the National Register as part of an historic district.
- *World War II-era batteries in Fort Funston, adjacent to the Presidio of San Francisco.* Listed in the National Register as contributing elements of an historic district.
- *Fort MacArthur*—Determined eligible for listing in the National Register.

Registration Requirements

As noted throughout, coastal defense is arguably the most thoroughly documented and thoroughly registered military property type in California. The World War II-era guns are no exception. Dozens of World War II-era batteries have been found to qualify for listing in the National Register. The bulk of these were listed in two groups: the NPS nominations for batteries it owns in the San Francisco Bay Area; and the large National Register nomination prepared by the Navy for Fort Rosecrans guns at Point Loma. Other batteries have been evaluated and registered as well, including the gun emplacements for Fort Emory at Imperial Beach. It appears that every World War II-era battery that has been evaluated has been found to qualify for listing in the National Register.

This universal finding of eligibility has taken place despite the fact that none of the batteries retains its guns. What have been found to qualify in all cases are the massive concrete buildings in which the guns were mounted. In the San Francisco, Marin, Imperial Beach, and Point Loma batteries, ancillary buildings, plotting rooms, fire control structures, magazines, and so forth, have also been found to qualify.

Coastal batteries were built at many locations during the war, leaving open the possibility that, in the future, gun emplacements and ancillary facilities may be identified on large coastal bases such as Vandenberg AFB or Camp Pendleton. If these resources are identified, the properties should be inventoried and evaluated in the context of the many properties that have already been found to qualify for listing in the National Register.

Two considerations should be taken into account in evaluating any new properties. First, the nearly universal registration rate (i.e. virtually every resource identified has been listed in the National Register) does not necessarily suggest that any new property is also eligible, because it is similar to properties that have already been listed. Rather, the presence of so many properties on the National Register suggests that it is necessary to exercise judgement about whether any new resource is more significant than the examples that have already been listed.

Second, the coastal defense during World War II for the first time began to take advantage of radar, a technology that was introduced during the war.⁶⁰ It does not appear that any World War II-era radar site has been listed or evaluated and perhaps none exist. However, this technology was a fundamentally new element of the coastal defense strategy and warrants evaluation as a new and different aspect of the various property types associated with this theme.

7.12 THEME 12: MILITARY ARCHITECTURE OF WORLD WAR II

World War II was a watershed development in many respects, not the least of which was its impact on military architecture. In the early years of preparedness, military designers adhered to older concepts of integrated base design. By 1942, however, all branches had abandoned the old design concepts in favor of quick, inexpensive, and standardized design and construction. The World War II experience resulted in a permanent change in the design philosophy of the military. Never again would military bases be designed as they had been before 1941. Post-war military architecture has much more in common with the temporary buildings of World War II than it does with the neo-classical architectural tradition that dominated military design from the early years of the Republic until the attack on Pearl Harbor.

As discussed in Chapter 6, during the interwar years military architects and planners adhered to the concept of “total base design,” in which architecture, landscape architecture, and city planning concepts were incorporated into unified plans for military bases. Bases from the 1920s and 1930s were as carefully planned as any generation of military design. In 1939 and 1940, all branches of the military began to build new bases and expand older facilities. The work from this period was similar in many respects to military design from the Interwar Era. It differed from work in the 1920s and early 1930s chiefly in terms of materials and style. The permanent construction from this period carried with it two dominant characteristics: the use of reinforced concrete and, in many instances, the use of Art Deco-influenced architectural detailing never used before or since in the construction of military buildings.

The year 1940 marks the end of “total base design” and the beginning of standardized, temporary construction. With the resumption of the draft in 1940, the Army was thrust into a position of needing vast new training bases, far beyond the available space on existing Army posts. These bases were needed immediately, forcing the Army to build the new facilities at a breakneck pace. For this reason, the Quartermaster Corps, and later the U.S. Army Corps of Engineers (USACE), adopted standardized plans for temporary buildings. The popular impression is that this

⁶⁰ This technological innovation is discussed at length in Thompson, 378-380. Thompson mentions that the “concrete pylons” from one early radar set still exist at “Hill 640,” a small reservation in Marin County. It does not appear, however, that property was listed in the National Register along with the other coastal defense properties.

standardized, low cost construction was restricted to the wartime years; this type of construction is commonly called World War II temporary. In actuality, this method of construction pre-dated the attack on Pearl Harbor by nearly two years. Thus, while the Navy and Air Forces were building permanent installations between 1939 and 1940, the Army was building temporary facilities around standardized plans, presaging the type of work that would be adopted by all branches during the wartime period.

Thus, the architecture of World War II occurred in two distinct phases: permanent, Art Deco design from 1939 and 1940, and temporary standardized buildings from 1940 through 1945. The two phases could hardly be more different from one another, although the reasons for the differences are easily understood in terms of the exigencies of wartime.

7.12.1 Property Type: Concrete, Art Deco-Influenced Permanent Base Designs

The immediate pre-war construction program, condensed into a few years between 1939 and 1940, produced a unique design for military bases, one not seen before or after. Some of the pre-war bases were designed in a “style” that blended the longstanding military emphasis on neo-classical forms with the fashionable Art Deco or Moderne design of the 1930s. This “style,” which was also used extensively on post office and Federal court buildings from the period, has been studied by various authors who have sought to develop a name for it. Lois Craig, in her study of Federal architecture, has called it “starved classicism,” emphasizing the residual classical influences. David Gebhard called it “Works Progress Administration Moderne,” emphasizing the Moderne qualities.⁶¹ In the present study, the style is called Art Deco, the most commonly recognized term that is used to refer to the streamline qualities of its design. It should be emphasized, however, that it is a highly unusual expression of the Art Deco.

As emphasized throughout this report, military designers were aware of popular trends in civilian architecture and eventually incorporated those styles into buildings on military bases. The military interpretation of a style, however, was almost always conservative and restrained, whether that be the Greek Revival, the Colonial Revival, or the Mission Revival. Nowhere was this more true than in the military use of the Art Deco. The Art Deco buildings at various bases, from Roosevelt Base to NAS Alameda and McClellan AFB, were quite conservative in comparison, say, to the great Los Angeles Art Deco office buildings, theaters, and commercial buildings that were designed at about the same time. The military Art Deco almost always made use of some type of classical allusions, referencing the long tradition of the neoclassical in

⁶¹ Lois A. Craig, *The Federal Presence: Architecture, Politics and National Design*. Cambridge, MA: MIT Press, 1984. David Gebhard uses this phase, chiefly in reference to post offices from the late 1930s, in *A Guide to Architecture in Los Angeles & Southern California*. Santa Barbara: Peregrine Press, 1977.

military design. The result was a style that was part classical and part Art Deco, a blending of styles that helps to explain the very different names given to this style by Craig and Gebhard.

In addition to the design of individual buildings, military planners laid out these bases with formal, orthogonal site plans, similar to the manner in which interwar bases had been designed. The elegance and formality of site planning in the pre-war years, as illustrated by the site plan of NAS Alameda (see Figure 30), contrasts starkly with the frenetic manner in which the wartime bases were laid out.

Examples:

- *McClellan AFB*—Listed in the National Register as an historic district.
- *NAS Alameda*—Determined eligible for the National Register as an historic district.
- *Naval and Marine Corps Reserve Center, Los Angeles*—Determined eligible for the National Register.
- *Roosevelt Base Historic District*—Determined eligible for listing in the National Register.
- *Naval Station, San Diego*—A 20-building historic district found to qualify for the National Register as an historic district, centered primarily around 1939-1941 permanent buildings. The permanent buildings in this district range from Art Deco to Mission Revival to strictly utilitarian.
- *Naval Reserve Center, Santa Barbara*—A rendition of the Mission Revival style, designed to blend with the architecture of the City of Santa Barbara.

Registration Requirements

Only a limited number of military buildings and structures were designed and built in this manner. The style, as it pertains to military construction, was highly specific to the late 1930s, although similar types of Federal design as well as civilian design were built throughout that decade.⁶² The style represents a distinct, albeit short lived, phase in military architecture and is deserving of recognition and registration in that regard.

It appears that all of the known military representations of this style have been listed in or determined eligible for the National Register, although the possibility exists that other buildings may be discovered on working military bases. The style is particularly well represented in areas

⁶² The Administration Building at Naval Station, Treasure Island, for example, is an excellent example of the style. It was not, however, built for the military; it was the headquarters building for the Golden Gate International Exposition, a World's Fair that was held on Treasure Island in the late 1930s, and was designed to serve as an airport building at the close of the fair. The building became the headquarters of the Naval Station during World War II.

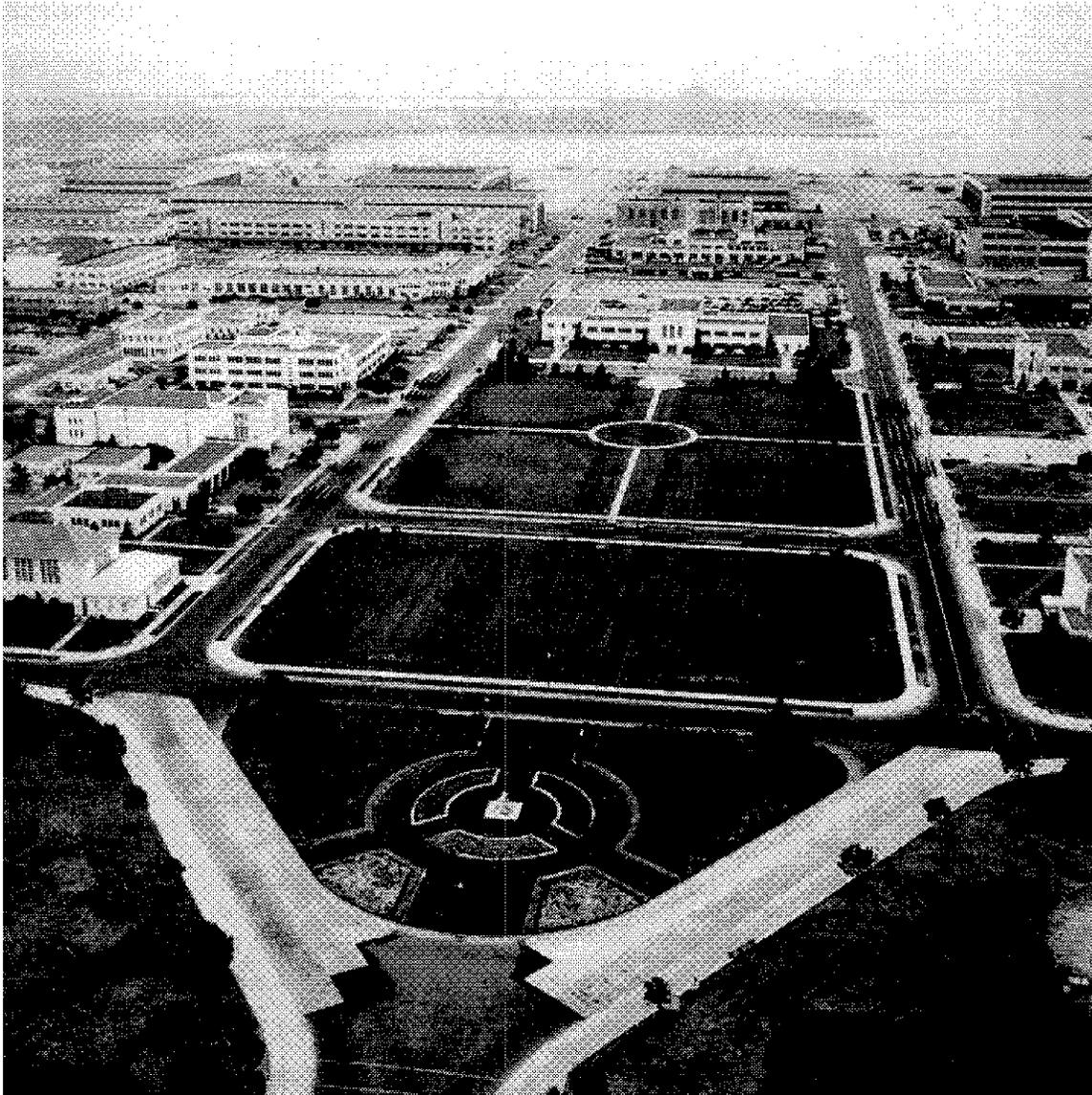


Figure 30. Aerial view of Naval Air Station, Alameda. The elegant and formal site plan typified pre-war, but not wartime, design. These 1938-1941 bases were the last to be laid out in such a manner. (Source: The National Archives.)

in which historic districts still exist, as with the historic districts at McClellan AFB and NAS Alameda. The Naval and Marine Corps Reserve Center, designed by noted Los Angeles architect, Stiles O. Clements, is essentially one large building and is a particularly good example of the style – arguably better than any single building at McClellan or NAS Alameda. Interestingly, all of these facilities have been or soon will be closed as military bases, leaving to local authorities the responsibility of caring for the only known examples of the style.

If additional examples of the style are identified, these should be judged on two major criteria: success as an example of this architectural style, and integrity. The properties should be evaluated using the guidelines associated with Criterion C, as an exemplification of this style. Not all examples are significant; the good examples in Alameda, Sacramento, and Los Angeles may be used as benchmarks or context for evaluating the success of the design. Integrity is particularly important in evaluating buildings in this regard. A potentially eligible building should retain the defining elements that characterize this unusual style.

7.12.2 Property Type: Pre-War and Wartime Temporary Building Designs

As noted earlier, the Army began constructing standardized and temporary-type buildings in 1940, when the draft was re-instituted and the branch was flooded with new recruits. Temporary-type construction was initiated on all Army posts in 1940 and 1941. The highest level of such activity, however, was at Camp San Luis Obispo, Fort Ord, Camp Roberts, Camp Parks, and Fort Hunter Liggett. These bases blossomed into small cities, all built around standard plans and temporary buildings. Figure 31 is an aerial view of Camp Roberts, showing a typical “instant city.” Contractors, working for the Quartermaster Corps or the Corps of Engineers, erected thousands of temporary buildings at these new Army bases, using first a Series 700 and later a Series 800 set of standard plans.⁶³ Most of these bases were not completed before December 7, 1941. Post-Pearl Harbor construction differed little from the pre-war construction except that it proceeded at an even more fevered pace. Engineering journals from 1940 and 1941 were filled with articles that marveled at the pace of design and construction of these Army buildings: one building completed per hour; 1,000 buildings in five months; and so forth.

⁶³ The Series 700 plans were derived from temporary building plans (called Series 600) used during World War I. The Series 800 plans were developed in 1941 and 1942, but refined over the course of the war. The easiest diagnostic tool for distinguishing Series 700 from Series 800 buildings is the presence of a pent roof, or secondary half roof, between the first and second stories of a two-story building; the Series 700 buildings had them, the Series 800 buildings did not. A large Army base from the period generally will include buildings from both series.

Our understanding of this theme has been advanced by a thoughtful nationwide context on the subject, prepared for USACE.⁶⁴ In that work, John Garner explores the site planning as well as the building types used in this temporary construction. Although his focus is on the Army, which led the way, he does discuss the design traditions of the Navy as well during this period. Garner is correct in pointing out substantial differences between the Army's 600, 700, and 800 series buildings, as well as distinctly different approaches taken by the Army and Navy. The various services and the two branches, however, have far more in common with one another than with the pre-war preparedness construction. The Army led the way toward temporary construction in 1940, but by 1942 virtually all military construction was carried out in this manner.

Within the DoD overall, World War II temporary buildings were constructed between the years of 1939 and 1946. There were two types of construction during World War II, temporary and permanent. A DoD-wide study of World War II construction, prepared by R. Christopher Goodwin and Associates, states that the two construction types were divided into four categories: (1) permanent, (2) semi-permanent, (3) temporary, and (4) theater-of-operation. The study concludes:

Permanent construction was intended for use after the war; it typically was built of masonry (brick, tile or concrete) and metal frame. Semi-permanent construction typically consisted of cinderblock construction, wooden-frame construction clad with synthetic siding, or a mixture of wooden frame and masonry. Semi-permanent construction often resulted from ad hoc compromises between the desire for permanent construction and shortages of time and material. Temporary construction consisted of wooden-frame buildings, typically built according to standardized plans, and of modular metal buildings. Temporary construction was not intended for use after the war. Theater-of-operations construction was the least durable type of construction.⁶⁵

The World War II-era temporary buildings were subjects of a nationwide Programmatic Memorandum of Agreement (PMOA) providing for their demolition.⁶⁶ DoD, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers executed this PMOA in 1986. As partial mitigation for demolition, DoD agreed to consult with the Historic American Building Survey/Historic American Engineering Record ,

⁶⁴ John S. Garner, "World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States," USACERL Technical Report CRC-93/01, March 1993.

⁶⁵ R. Christopher Goodwin & Associates, Inc., "(Draft) Historic Context for Department of Defense Facilities, World War II Permanent Construction," Prepared for the Army Corps of Engineers, Baltimore District, June 1994.

⁶⁶ The provisions of the PMOA and its relation to HABS documentation are discussed in Garner, 1993. The term, PMOA, is no longer used; more recent regulations of the Advisory Council on Historic Preservation have substituted the term, Programmatic Agreement (PA), for what was previously called a PMOA.

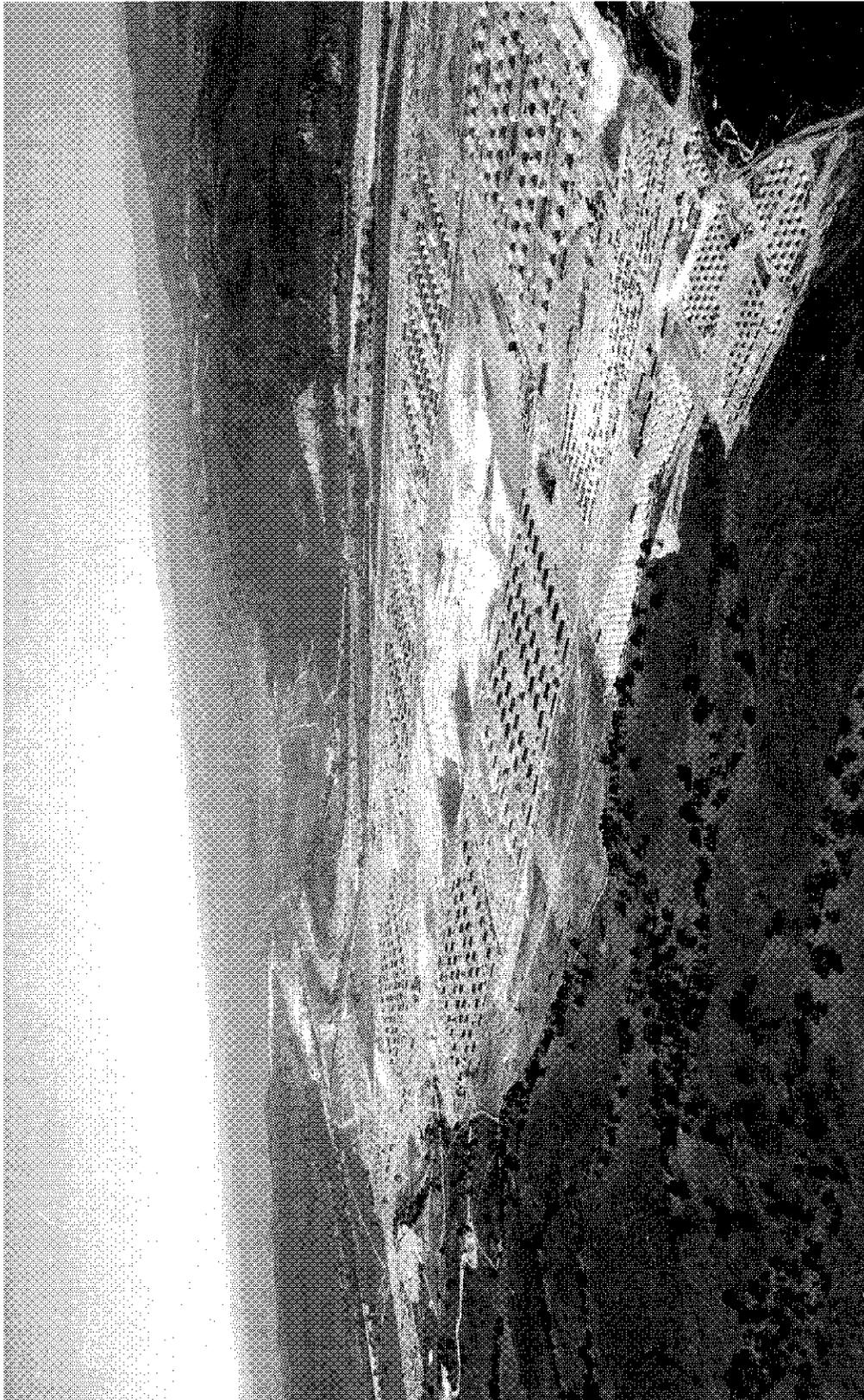


Figure 31. Camp Roberts; aerial view in May 1941. Camp Roberts was typical of the "instant city" Army camps built soon after the draft was reinstated in 1940. (Source: The National Archives.)

(HABS/HAER) to document the history and diverse examples of World War II temporary buildings. The U.S. Army Construction Engineering Research Laboratories (CERL) coordinated the study of surviving DoD temporary structures as a provision of the PMOA.

Examples:

- *Fort Ord* – Generally not inventoried. Several World War II-era buildings were identified as having potential for listing in the National Register, including Stilwell Hall, Martinez Hall, and the East Garrison Mess Hall. These buildings, however, were all permanent or semi-permanent and were apparently selected as National Register-eligible because they were *not* typical World War II temporary buildings.
- *Fort Hunter Liggett* – Not completely inventoried. No World War II buildings or structures have been found to qualify for the National Register.
- *Camp San Luis Obispo* – Not inventoried.
- *Camp Roberts* – Inventoried. No World War II-era buildings or structures found to qualify for the National Register.
- *Camp Parks* – Several buildings inventoried, but found not to qualify for listing in the National Register. The base has not been inventoried comprehensively.
- *Fort Cronkhite cantonment* – Listed in the National Register as part of Fort Baker, Barry, and Cronkhite Historic District. These buildings were found to qualify as an intact enclave of World War II temporary buildings.

Registration Requirements

Although many were built prior to the attack on Pearl Harbor, all World War II-era temporary buildings are similar in several important respects, not the least of which is the fact that they have been analyzed in historic context on several occasions and are the subject of a nationwide PMOA, as discussed above. The PMOA was prompted by a congressional mandate to DoD to demolish or otherwise dispose of World War II temporary buildings under its jurisdiction because of the excessive costs required to maintain them. The PMOA finds that such buildings may qualify for listing on the National Register, but accepts their loss as being in the public interest. To mitigate this loss, DoD undertook a nationwide study to record World War II temporary construction and to identify representative examples to be preserved. The PMOA did not address the significant historic uses to which many temporary structures were put during World War II. For example, the Norden bomb site greatly improved the accuracy of Allied aerial bombardment, and was developed in a temporary World War II building.

Three factors work against National Register eligibility for World War II temporary buildings: their lack of architectural merit; the routine nature of the functions of most of these buildings; and the fact that they typically lack integrity. As the name “temporary” indicates, these buildings were not designed for permanent use; the Army and Navy did not expect them to serve any longer than the war. Many were pressed into long-term service after 1945, however, but only by converting them into what is commonly called “semi-permanent” status. This conversion almost always involved re-siding the buildings, putting them on permanent foundations, changing the windows, and a host of other upgrades.

These three factors help explain why so few World War II temporary buildings have been found to qualify for the National Register. In this respect, it is an artificial distinction to separate the temporary Army buildings from 1940 from the remainder of the World War II-era temporary buildings. While there are subtle differences between the 700 Series buildings of the early war years and the later 800 Series, those differences have not been reflected in National Register determinations for the two building groups. Similarly, there are notable differences between Army and Navy temporary plans, but those differences are not significant in the longer perspective. Although thousands of World War II temporary buildings still stand in California, and many of these have been inventoried, only a very small number of such buildings have been found to qualify for the National Register. Three 1940 buildings or groups of buildings at Fort Ord were found to qualify, either for events associated with them or for their architectural merit: Stilwell Hall, Martinez Hall, and the East Garrison. All were designed in Mission Revival style and included stucco siding and tile roofs. The buildings were apparently designed by architects and engineers who were in training at the new post. The cantonment at Fort Cronkhite in Marin County was found to qualify for the National Register specifically because it represents an intact example of World War II temporary construction and because it “may be one of the best preserved World War II posts state- and nationwide.”⁶⁷ The Oakland Army Base, which functioned chiefly as a supply depot, was found to qualify for the National Register chiefly for its historic role in the supply network of the Army.

In time, the nation’s perspective on World War II temporary buildings may change, as these still-abundant buildings begin to disappear. In the short run, the registration requirements for this property type may be inferred from the pattern that has prevailed in prior evaluations. These properties have been found to qualify when they are associated with events that go beyond the routine, i.e. are associated with important events. All World War II-era buildings are associated in some respect with the war effort; important events must be demonstrated to go beyond that

⁶⁷ National Park Service, “Forts Baker, Barry and Chronkhite Historic District, Amendment to National Register Nomination,” 1996.

general association. Second, the property must retain a high degree of integrity. Given these twin requirements, it is anticipated that a low percentage of these temporary buildings will be found to meet the criteria for listing in the National Register.

Although most World War II-era bases in California have been inventoried, there are still many World War II-era temporary buildings that have not been inventoried or evaluated. The 1986 PMOA allows demolition of World War II temporary buildings without further Section 106 review. The PMOA allows such demolition, whether or not the temporary building is eligible for the National Register. It may be a prudent practice, however, for the base commander to treat the eligible temporary buildings in a different manner. As noted, very few temporary buildings have been found to qualify and it is anticipated that few will be identified in the future. When historic research indicates that an extraordinary event occurred in a temporary building – the development of the Norden bombsight, for example, or tests associated with the Manhattan Project – it may be proper for the base commander to waive the provisions of the PMOA in dealing with a building that is demonstrably important to the legacy of that base or to the military generally.

⁶⁸ The Series 700 plans were derived from temporary building plans (called Series 600) used during World War I. The Series 800 plans were developed in 1941 and 1942 but refined over the course of the war. The easiest diagnostic tool for distinguishing Series 700 from Series 800 buildings is the presence of a pent roof, or secondary half roof, between the first and second stories of a two-story building; the Series 700 buildings had them, the Series 800 buildings did not. A large Army base from the period generally will include buildings from both series.

⁶⁹ John S. Garner, "World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States," USACERL Technical Report CRC-93/01, March 1993.

⁷⁰ The provisions of the Programmatic Agreement and its relation to Historic American Buildings Survey documentation are discussed at length in: John S. Garner, "World War II Temporary Military Buildings: A Brief History of the Architecture and Planning of Cantonments and Training Stations in the United States," USACERL Technical Report CRC-93/01, March 1993.

⁷¹ National Park Service, "Forts Baker, Barry and Cronkhite Historic District, Amendment to National Register Nomination," 1996.

8.0 COLD WAR-ERA PROPERTIES, 1946-1989

The Cold War Era begins with the end of World War II and ends with the fall of the Berlin Wall. Arguably, the Cold War represented the high-water mark for military activity in California. During this period, California emerged as the leading high-technology center in the United States and California military bases emerged as leading-edge technology centers for the United States military. California military installations played pivotal roles in the development of two fundamentally new technologies: the jet aircraft and the guided missile. The contributions in these areas were as important as any other event in the history of the military in California. To a lesser but still important degree, California military installations participated in other seminal Cold War developments, including the development of the ICBM, the comprehensive detection and retaliation system associated with the SAC, and numerous other leading-edge technologies.

Although the principal focus was on the development of new weapons and aircraft, the more traditional goals of the military in California—training troops for warfare in Korea, Vietnam, and elsewhere—did not disappear altogether. The Korean and Vietnam conflicts, in particular, impacted California training and supply depots, which were called upon to supply troops and cargo for conflicts across the Pacific Ocean.

The Cold War themes, then, fall into two general categories: the “high technology” themes that define much of the significance of the achievements of California military bases during this period; and the more routine thematic areas, such as training and support, which have typified the role of California military installations for more than a century. The discussion that follows focuses to a great extent upon the first group of themes because these go beyond the ordinary or routine functions of the military. This non-routine characteristic is important in that nearly all Cold War-era resources are less than 50 years old and must be shown to be exceptionally significant in order to qualify for listing in the National Register.

This emphasis on leading-edge technology, while consistent with the requirement to establish exceptional significance, can lead to a biased presentation of the history of the military during this period. The vast majority of the men and women who served in the military during the Cold War, as well as the majority of civilian employees at California bases, were involved with so-called “routine” functions. The use of this term should not imply that these people were not doing important work. Rather, the emphasis upon non-routine, leading-edge developments is pursued in recognition of the higher burden of proof that is required in determining National registration eligibility for properties that may have achieved significance during the last 50 years.

8.1 THEME 1: WEAPONS RESEARCH AND DEVELOPMENT

The military, like private industry, recognized two distinct phases in weapons procurement: R&D and T&E. The distinction is sometimes blurred by the iterative process through which products are developed, tested, and then re-tooled on the basis of test results. For practical purposes, however, the distinction holds as a basis for classifying the roles of California military installations involved in weapons development.

Throughout the Cold War, military personnel, private contractors, and universities cooperated closely on R&D for weapons development. Arguably, many university and private business laboratories and manufacturing facilities were as important as the facilities on military installations. The lines between the military, universities, and industry were sometimes blurred. Most military installations with R&D responsibilities included provisions for industry as well. Other military bases existed for the sole purpose of coordinating the R&D of private industry and/or universities, and sometimes shared research laboratories and test facilities with industry groups. California universities often maintained a permanent presence on high-technology military bases, using the same government-owned laboratories and test facilities as the military and private industrial scientists.

8.1.1 Property Type: Integrated Laboratories

One property type that was directly associated with the weapons R&D program was the integrated laboratory. The integrated laboratory afforded the opportunity for many allied scientists and craftsmen to work together under one roof to develop prototype weapons or other systems. On rare occasions, the government built great integrated laboratories; fully staffed and fitted institutions that rivaled the resources available at the best universities or industry-based laboratories. The Michelson Laboratory at NAWS China Lake, shown in Figure 32, is perhaps the most representative example, although there were others as well. The Michelson Laboratory was both a building and an institution. When resources were available, the military preferred to house as many scientists and scientific functions as possible within the confines of a single, very large building.

The integrated, government-owned laboratory was actually the exception rather than the rule in the larger R&D program for weapons and other military systems. As a general rule, the Navy tended to retain in-house, civil service experts for R&D work, while the Army and Air Force relied far more on outside consultants, whether university- or industry-based. Although there are a small number of government-owned integrated laboratories, the military commonly relied upon

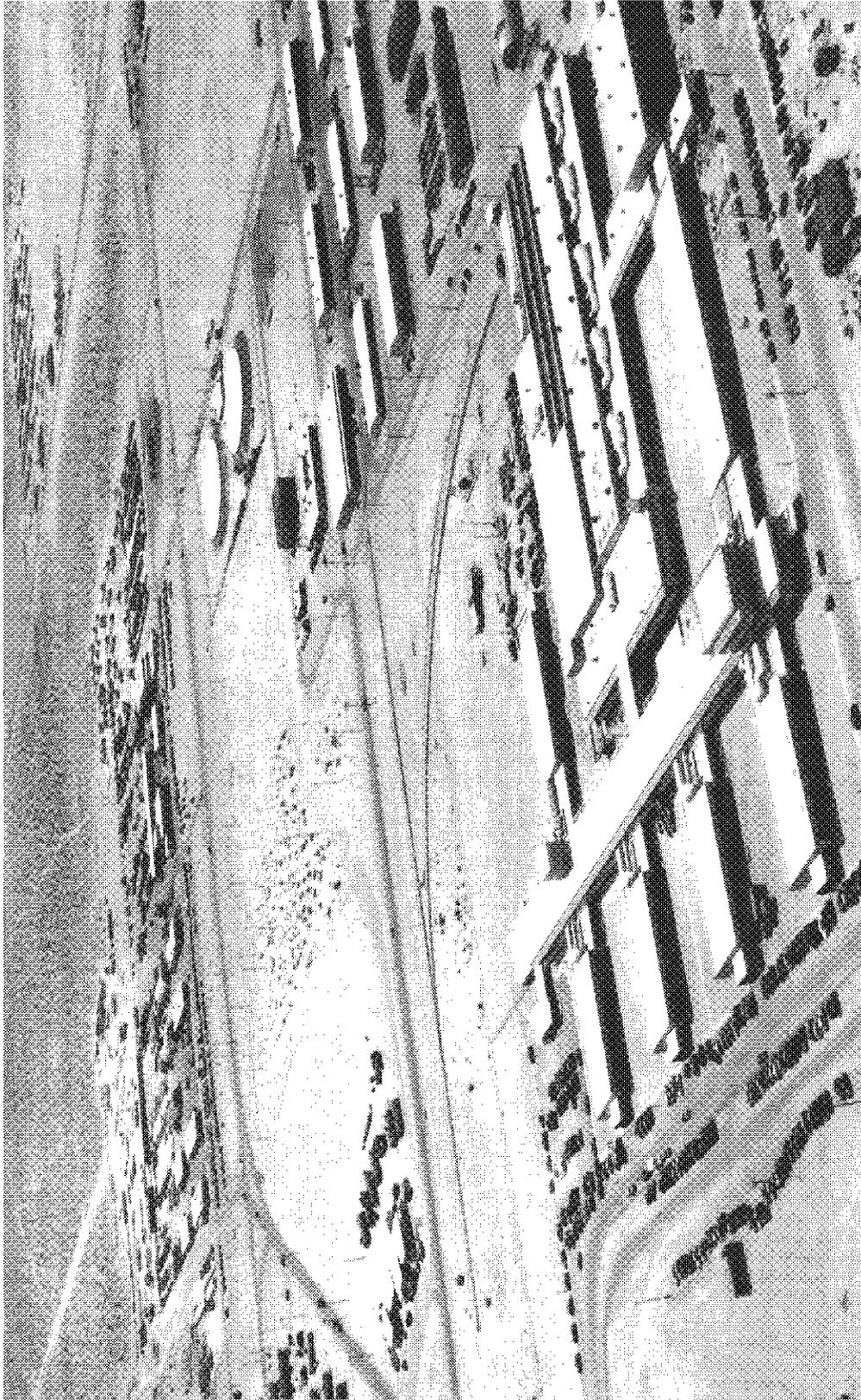


Figure 32. Michelson Laboratory, NAWS China Lake. Completed in 1948, it set the standard for integrated laboratories at the Navy, as well as other branches. Architecturally, the Michelson Laboratory plan, with a long central corridor and projecting wings, was copied on other bases. (Source: the National Archives.)

the private sector for this function, exercising oversight and budgetary control over a process that was centered on the private sector.

Some of the early R&D weapons laboratories were transferred to NASA, or retained by universities, for advanced space-related research and development. The Lawrence Livermore Laboratory has always been a Department of Energy (or Atomic Energy Commission) facility, under the control of the University of California. The Lawrence Laboratory in Berkeley is a university-controlled property as well, operated for the Department of Energy.⁷² The Jet Propulsion Laboratory in Pasadena has always been operated under contract by Caltech. It began as an Army-sponsored laboratory, but has been transferred to NASA.

Examples:

- *Michelson Laboratory, NAWS China Lake*—Determined eligible for listing in the National Register.
- *Ames Research Laboratory, NAS Moffett Field* (now Moffett Federal Airfield)—Apparently not evaluated.
- *Jet Propulsion Laboratory, Caltech, Pasadena*—Parts determined eligible for the National Register (not a DoD facility).
- *Lawrence Livermore Laboratory, Alameda County*—One building inventoried, found not to qualify for the National Register (not a DoD facility).
- *Building A33, NEL, now SSC San Diego*—Built in 1950-1951 and home to the Navy's R&D program for sonar and a host of other shipboard electronics. This property has been evaluated and appears to meet the criteria for listing in the National Register.
- *Newer laboratories at NAWS China Lake, NAWS Point Mugu, SSC San Diego and elsewhere*—Either not evaluated or found not to qualify because of their recent dates of construction.

Registration Requirements

There are probably hundreds of buildings at dozens of military installations in California that have been called laboratories at one time or another. Most of these buildings, however, were limited in their scope and activities. The integrated laboratory, as exemplified by the Michelson Laboratory, the Ames Laboratory, the Jet Propulsion Laboratory, the Lawrence Laboratory, and Building A33 (NEL), is a much more rare property type. While inventories have been completed

⁷² The role of the University of California in Cold War weapons research and the general role of university-based "Big Science" in military contracting is discussed in an excellent web-published book, William E. Johnson, et al, "Lawrence and His Laboratory," www.lbl.gov/Science-Articles.

at Michelson Laboratory, Jet Propulsion Laboratory and Building A33, Point Loma, the Ames Laboratory has yet to be inventoried and evaluated, and Lawrence Laboratory has had very little inventory work. It is possible, but not likely, that more fully integrated laboratories will be identified.

Michelson Laboratory suggests two facts about these buildings or complexes: they were highly significant in weapons development; and they suffer a loss of some integrity owing to the need to upgrade the facilities to keep them in a “state of the art” condition. The Michelson Laboratory was designed with this flexibility in mind, allowing most changes to be restricted to the interior, although some changes have occurred on the exterior as well. The exterior of Building A33 is almost completely unmodified, although the interior has been altered on a regular basis; it, too, was designed to facilitate this flexibility.

To some degree, integrity, significance, and age must be balanced in the evaluation of this type of building. The essential questions are: how significant is the resource, and to what degree has it been modified? If, as in the case of the Michelson Laboratory, the level of significance is very high and the degree of modification moderate to low, the property may be significant or even exceptionally significant (Michelson Laboratory is more than 50 years old but is likely exceptionally significant as well). If, however, the significance is not exceptional and the degree of modifications is very high, the property likely does not qualify, particularly if the age is less than 50 years.

Although this report focuses on DoD property, it is recommended that NASA, the Department of Energy, and the various universities that own and operate similar laboratories, evaluate their properties in the broader context in which these laboratories were created, which was the early military Cold War weapons R&D.

Michelson Laboratory at NAWS China Lake and Building A33 at SSC, Point Loma are also distinctive examples of what might be called “Cold War architecture.” The design of military buildings during the early Cold War was decidedly modern and unlike any buildings the military had commissioned in earlier periods. The Cold War generally lacks a coherent architectural theme or program; a unifying style that was as important as, say, the Mission Revival was during the interwar years. Nonetheless, on occasion, the military built excellent buildings that speak to the high technology and sense of progress that epitomized the approach to the Cold War. The Michelson Laboratory and Building A33 are arguably the best examples of this “style,” which is discussed as a separate theme, Theme 9, “The Architecture of the Cold War.”

8.1.2 Property Type: Military Bases for Oversight of Weapons R&D by Private Contractors

As noted, most research and development for weapons systems was accomplished, not by civil service scientists and engineers, but by private corporations, many of which had active offices, laboratories, and production plants in California. The military, however, was not divorced from the process. The requirements for Cold War weapons were so specialized and exotic and the costs so enormous that it was essential for military planners to exercise control over these contracts. There developed in the Los Angeles area and to a lesser degree in the San Francisco Bay Area military bases that were dedicated to the control and supervision of private efforts in the area of weapons research and development. These were official military bases, but personnel there worked closely with private industry contractors, often providing office and laboratory space for contractor employees as well.

Examples:

- *Los Angeles AFB, Space Division*—This base near Los Angeles International Airport was activated in 1954 as the Western Development Division to oversee R&D on ICBM systems. This division was established as a direct result of the “Teapot Committee” recommendation that the Air Force proceed with a major program to develop ICBMs.⁷³ In 1956, it gained oversight of the Air Force satellite program as well. It shared office space with TRW, the prime contractor for both programs. This base has long been the main site of Air Force R&D for long-range missiles. The physical space has changed over time. This base has not been inventoried or evaluated.
- *Onizuka Air Force Base, Sunnyvale*—The functional units assigned to this base were established in 1956 to oversee satellite contracts with Lockheed Corporation and originally shared space with Lockheed in Palo Alto. The units moved to this location in 1960. This base has not been inventoried or evaluated.

Registration Requirements

This property type is one of the least studied aspects of the Cold War military presence in California. In the absence of inventory efforts, it is difficult to establish registration requirements; we simply do not know the types of buildings and laboratories associated with this effort. Several points are pertinent to registration of such properties. First, the general property type has not been studied, or the individual buildings and structures that may be associated with it. Second, the installations date initially to the 1950s, but matured in later years. Because they are so young, these properties must be shown to have a very high degree of exceptional

⁷³ John C. Lonnquest and David F. Winkler, “To Defend and Deter: The Legacy of the United States Cold War Missile Program,” USACERL Special Report 97/01, November 1996 The story of this base is contained in Chapter 4.

significance to qualify for the National Register. Second, the potential exists for such a high degree of exceptionality because these properties are directly associated with missile development programs that were at the forefront of the Cold War effort. Third, it is likely that the buildings have been modified extensively over time, owing to the rapid evolution of technologies and the need to modify buildings to keep pace.

8.1.3 Property Type: Test Stands for Propellant

The propulsion test stand crosses the line between R&D and T&E. Every missile or rocket system relies upon liquid or solid fuel to propel it toward its target, as do the NASA spacecraft and systems for sending satellites into orbit. This technology was poorly understood at the end of World War II, but was the subject of one of the most intensive R&D programs in American history. California military installations played major roles in every aspect of this program, from the relatively small rocket motors for air-to-air missiles to the huge motors required for ICBM and space program rockets.

Among the important property types associated with this program was the propellant test stand, or “captive” test stand, from which a rocket motor could be fired without taking flight. These test stands could be built only in very isolated areas, owing to the dangerous and highly secretive nature of the tests. Two military installations were particularly active in this type of testing: Edwards AFB and NAWS China Lake. (Vandenberg AFB and NAWS Point Mugu would emerge as major missile launch facilities, but were not fitted with captive test stands.) This type of testing began during World War II at both installations and continues today. A photograph of a major propellant test stand at Edwards AFB is shown in Figure 33. Other bases may have been used for this testing as well, such as the isolated Mojave Desert Army base, Fort Irwin, although this use by the Army has not been documented.

Examples:

- *Test stands of the Air Force Research Laboratory, Edwards AFB*—Thirty-five buildings associated with nine test areas have been found to qualify for listing in the National Register.
- *Jet Propulsion Laboratory, Edwards Test Site, Edwards AFB*—Inventoried and tentatively identified as a potential historic district.
- *Test stands at “Skytop” at NAWS China Lake*—Found not to qualify for listing in the National Register because they lack exceptional significance.

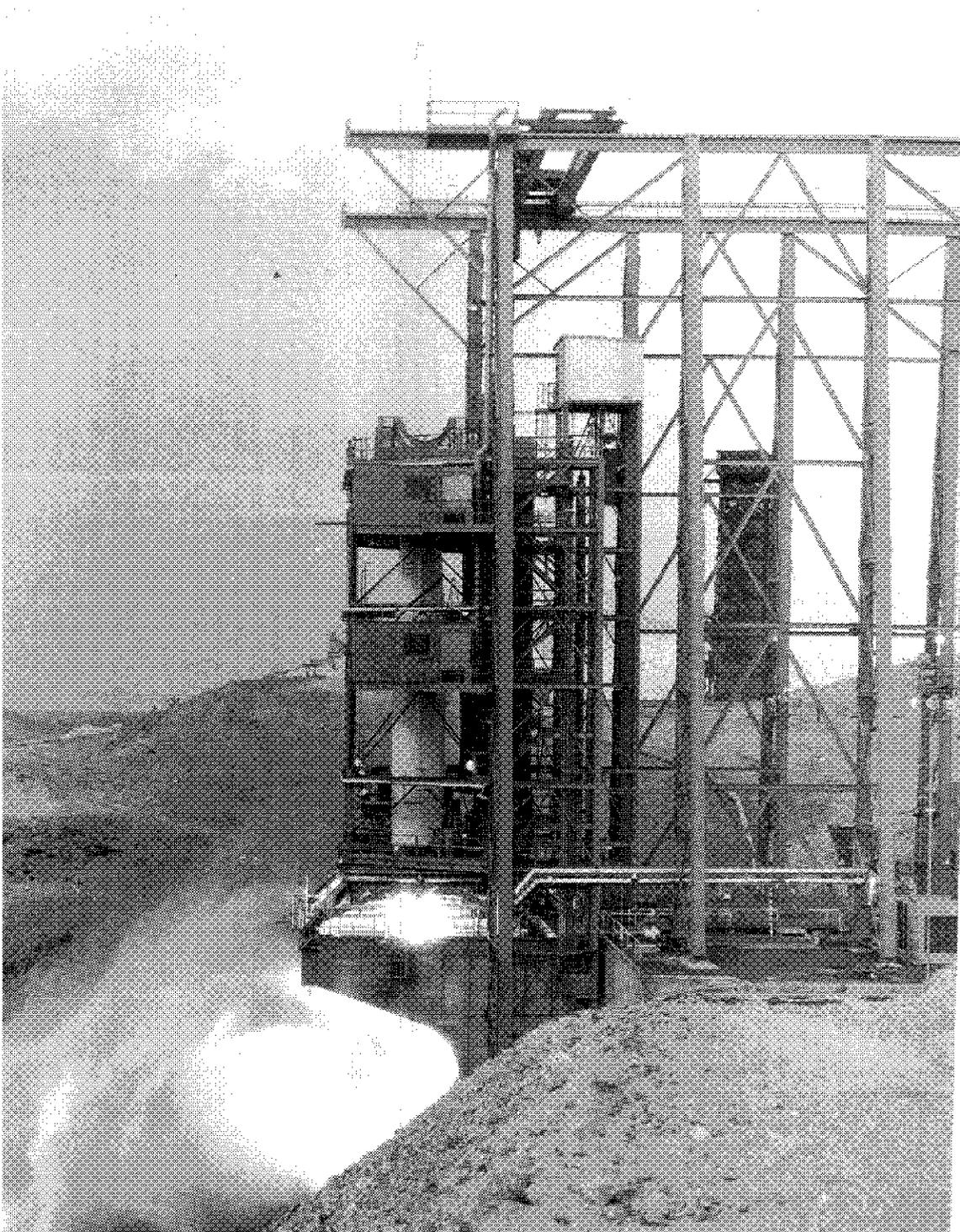


Figure 33. Propellant static test in progress on a test stand at Edwards AFB, 1958. The motor is for a Thor missile. Many of the test stands at Edwards AFB have been determined eligible for the National Register. Unfortunately, many of the early test stands no longer exist. (Source: the National Archives.)

Registration Requirements

Propellant test stands take many shapes and have varying degrees of integrity. Some stands are horizontal, others vertical. Some include permanent buildings around the stands; others include a paved area or even open ground in which temporary stands may be erected. The tests at these stands are highly individualized, requiring a substantial re-working of the facility to handle different sizes and types of rocket motors.

The comprehensive studies at Edwards AFB and NAWS China Lake suggest that three factors need to be considered when evaluating the potential significance of test stands: age; directness of association with important tests; and integrity. The propellant testing program has continued without interruption since the early 1950s. The Air Force Research Laboratory at Edwards AFB was used to test the very large motors for the Atlas and Titan program during the 1950s. This work was highly significant, occurred relatively early in the Cold War, and required very permanent buildings to contain the huge motors. The work at China Lake, by contrast, was focused initially on small rocket motors for air-to-air missiles and did not require very large buildings at that time. The station ultimately built huge test stands for the Trident program, but this did not occur until the 1970s. Of the various test stands at China Lake, only the very recently built structure had a very high association with important tests as well as a high degree of integrity. A high threshold of exceptional significance related to their young age, however, resulted in a determination that the test stands did not qualify for the National Register at this time.

8.2 THEME 2: WEAPONS AND AIRCRAFT T&E

As noted, the distinction is often blurred between R&D and T&E in weapons development. R&D facilities are concerned with the early stages of weapons development, from an experimental phase through a state in which the product appears to be reliable. T&E facilities are concerned with taking that weapon to production, as well as testing weapons that emerge from the production process. The process is so iterative, however, that R&D and T&E facilities often exist side by side on military installations. The propellant test stands at Edwards AFB, for example, are in close proximity to one another but some are classified R&D and others T&E.

Although some types of weapons T&E occurred at many locations, a handful of military installations dominated this work. These occur in two locations: ground ranges in the Mojave Desert and sea ranges along the Central and Southern California coastlines. The most active bases in this regard were: Vandenberg AFB and Edwards AFB, and NAWS China Lake and

NAWS Point Mugu. The T&E program was so complex that a large number of property types may be seen as part of this program.

In addition to their role in developing air weapons, California military bases played key roles in the development of the jet aircraft. While numerous bases contributed to the broad effort, no base was as importantly involved than Edwards AFB. Modern aircraft are constantly being refined and modified, such that every hangar on every air base has likely been used at one time or another to work on some type of experimental aspect of aircraft design. The theme is more importantly directed, however, at the truly cutting edge aircraft that revolutionized air travel and warfare during the Cold War.

8.2.1 Property Type: Missile Launchers

California military installations as well as California industry were at the forefront in testing and evaluating missiles. Some of the key early missile launch facilities were built in the state. Missile launchers, depending upon the size and complexities of the weapon, could be quite primitive or very complex. In many instances, test launches were conducted from temporary stands, hauled to a launch site along with the weapon. Through the years, however, these launch facilities grew increasingly permanent and complex. This was particularly true of the launch facilities for ICBMs and rockets for space vehicles. The launch sites for ICBM and space rockets are such special cases that they are treated as separate themes.

Most early missile launchers were simple devices, replicating shipboard, aircraft, or even mobile ground devices. These launchers are as much pieces of machinery as they are buildings or structures. Permanent facilities were apparently constructed only when the volume of testing warranted that expenditure, or when the missile was so large that permanent facilities were needed to make the launch possible, as was the case with intercontinental ballistic missiles. The permanence of the facility, then, is an indicator of the importance of the facility as well. Building 55, for example, was built in the early 1950s at NAWS Point Mugu as a heavily reinforced concrete building that had permanent launch facilities on its roof (Figure 34). This design, which was apparently unique, typifies this degree of permanence. The Space Launch Complexes at Vandenberg AFB similarly were built to last, reflecting their key role in launching both ICBM and space rockets. The Variable Angle Launcher at Morris Dam was found to qualify for the National Register on the basis that it was a unique and important engineering achievement and because it made an exceptionally significant contribution to the design of aircraft-launched torpedoes.

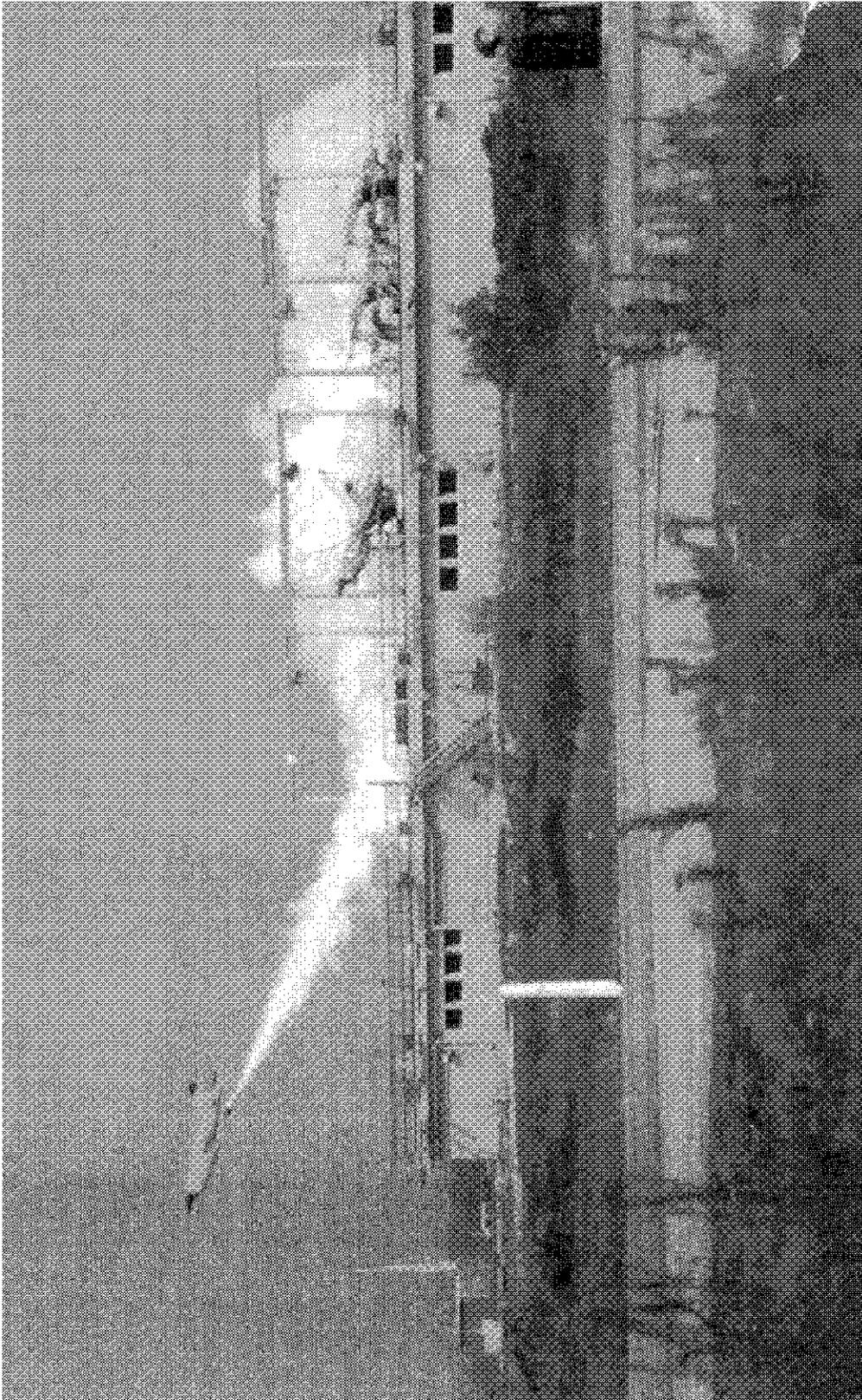


Figure 34. A target drone being fired from the roof of Building 55, NAWA Point Mugu. The control rooms for the building are partially below ground, connected electronically to the launch pads on the rooftop. (Source: the National Archives.)

Examples:

- *Building 55, NAWS Point Mugu*—Determined eligible for listing in the National Register.
- *Space Launch Complex 10, Vandenberg AFB*—Listed as a NHL, part of NPS' Man-in-Space Theme Study.
- *Space Launch Complexes 2, 3, and 4, Vandenberg AFB*—Determined eligible for listing in the National Register.
- *Atlas, Titan, Minuteman, and Peacekeeper launch facilities, Vandenberg AFB*—Determined eligible for listing in the National Register.
- *Baker Complex, NAWS Point Mugu*—A cluster of three launch facilities from the early 1950s. Determined eligible for listing in the National Register.
- *Variable Angle Launcher, Morris Dam, Asuza*—A BRAC closure Navy facility. Determined eligible for listing in the National Register. This launcher was used to test aircraft-fired torpedoes. (The National Register-eligible buildings and structures at this property were demolished after it had been evaluated.)

Registration Requirements

As with many Cold War-era properties, the missile launchers should be evaluated through a balancing of three considerations: directness of associations with important tests; rarity; and integrity. With the Cold War properties, a fourth factor must also be considered: age, i.e. how near it is to being 50 years old. The Baker Complex at NAWS Point Mugu is a good example of a very early missile launch facility (it is nearly 50 years old) that retains a high degree of integrity. Its importance is not reflected in its association with very important tests but in the fact that it is a rare and unmodified example of the design of the early missile launchers. Building 55, also at NAWS Point Mugu, reflects a later design that is unmodified and also associated with important tests. The Space Launch Complex as well as the various ICBM launch complexes at Vandenberg AFB are later still but significant for their association with very important launches there. They are also rare examples of their property type. The importance of the ICBM and space launchers is discussed in separate themes.

8.2.2 Property Type: High-Speed Test Tracks

The high-speed test track is particularly important to the history of the military in California because it was a California invention and was used more extensively in California than in any other state. High-speed test tracks were first developed during World War II but were not used successfully until the late 1940s. The high-speed test track was (and is) a very high-speed (usually supersonic) railroad that was used to test the performance of various test items under high-speed conditions. Although there were numerous variations, most tests concerned missiles

and aircraft, including ejection systems for aircraft. These tracks were used in T&E (and, to some degree, R&D) work on virtually every major missile system as well as important components of aircraft design and the design of the early space capsules. The tracks were also used to test the effects of high speeds on humans. While the Air Force made test runs with humans aboard; there is no indication that the Navy made any runs with people aboard.⁷⁴

These tracks were invented in California: both the Navy and Air Force were active in developing the earliest high-speed test tracks and to in perfecting this important test tool. Depending upon certain assumptions about what constitutes “high speed,” the first high-speed test track was built, either at NAWS China Lake by the Navy or at Edwards AFB by the Air Force. For many decades, those two bases were at the forefront in research, not only into weapon systems but also in the science of high-speed track design. In time, the high-speed test track at Holloman AFB in New Mexico became the premier facility of this sort, leaving only the Navy’s Supersonic Naval Ordnance Research Track (SNORT) as a major active track in California (Figure 35).

Examples:

- *SNORT, NAWS China Lake*—Determined eligible for listing in the National Register.
- *B-4 Track, NAWS China Lake*—Determined eligible for listing in the National Register.
- *North Base Test Track, Edwards AFB*—Determined eligible for listing in the National Register.
- *South Base Sled Test Track, Edwards AFB*—Determined eligible for listing in the National Register.
- *K-2 Track, NAWS China Lake*—Determined not to be eligible for listing in the National Register.
- *Lark Ramp, NAWS China Lake*—Determined not to be eligible for listing in the National Register.

Registration Requirements

The four high-speed test tracks – two each at Edwards AFB and NAWS China Lake – that have been found to meet the criteria for listing in the National Register are highly significant and collectively represent the important role of Californians in the invention and perfection of this test platform. These properties suggest the high standards that can be held with respect to this

⁷⁴ This property type has been studied in the national context in: JRP Historical Consulting Services, “High-Speed Test Tracks at the Naval Air Weapons Station, China Lake,” December 1999.

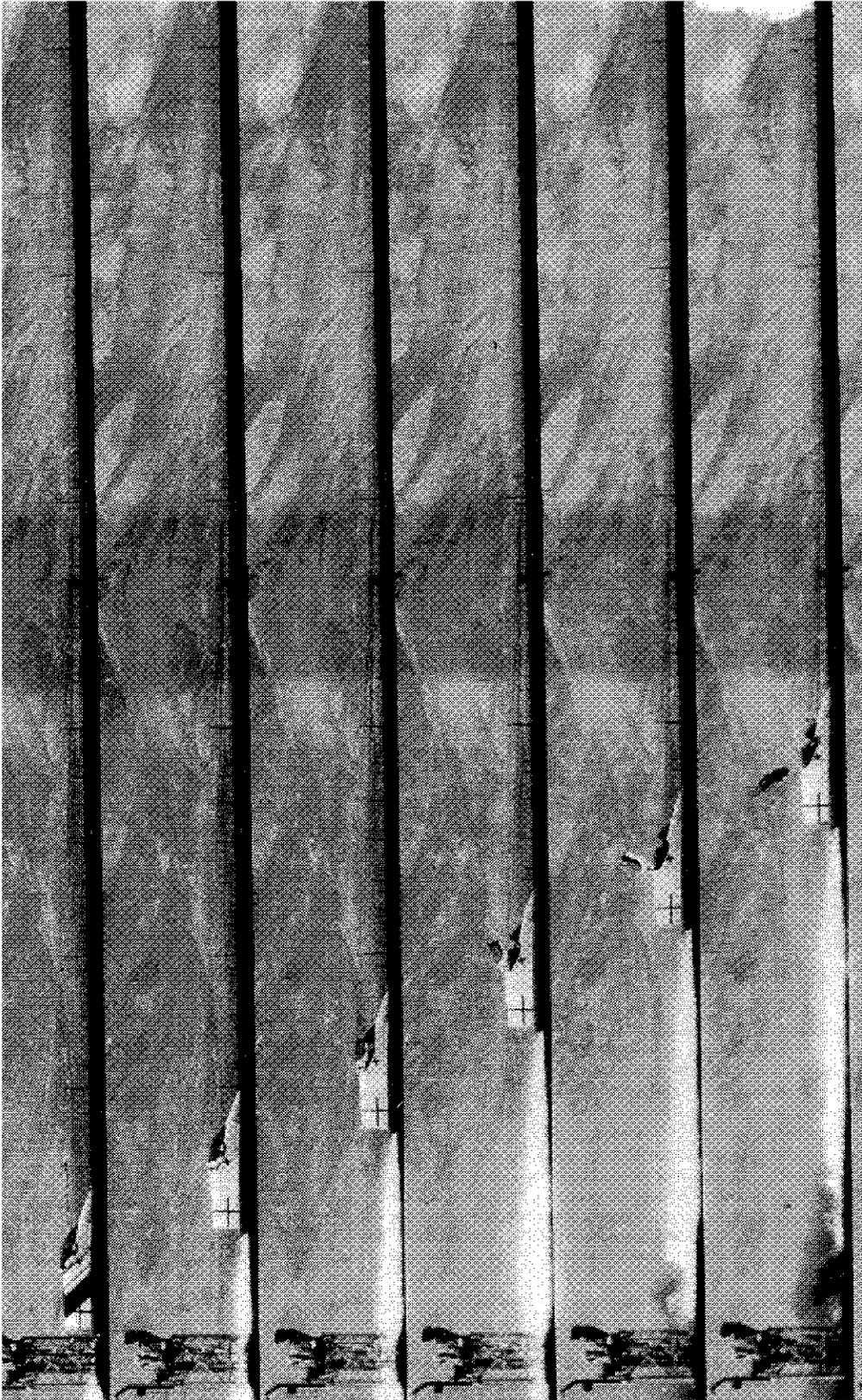


Figure 35. High-speed cameras capture a high speed run on the Supersonic Naval Ordnance Research Track (SNORT) at NAWS China Lake. This 1955 test involved a jet aircraft ejection seat from which a dummy was ejected. (Source: the National Archives.)

property type. It is possible (although unlikely) that previously unevaluated test tracks may be discovered. These should be evaluated in the broader context that includes the four excellent properties that have been determined eligible for the National Register.

Integrity is a special consideration for such tracks for two reasons. First, if the track has been abandoned, it is likely that the rails and other valuable materials were salvaged and removed at some point. This was the case with both Edwards AFB tracks and part of the B-4 Track at NAWS China Lake. Second, if the track is still in use, it is likely that it also has been renovated through the years. The Holloman AFB track has been upgraded on a regular basis. SNORT, on the other hand, is in its original condition.

The tracks that were found not to qualify point the way for treatment of integrity of these types of properties. These tracks were found not to qualify on the basis of loss of integrity: the tracks simply no longer exist. It is possible but unlikely that there are high-speed test tracks on military bases in California that have yet to be inventoried or evaluated. The broader context for this property type has been established; any newer track must be measured against the significance of the tracks that have already been inventoried and found to qualify for the National Register.

8.2.3 Property Type: T&E Buildings

The T&E program for weapon system requires a variety of control buildings, to ensure safety, record the results of the tests, prepare the weapon component for the test, and so forth. At most installations, however, one central headquarters housed all of these functions for the T&E program.

Examples:

- *Building 36, T&E Building, NAWS Point Mugu*—Determined eligible for listing in the National Register.

Registration Requirements

Nearly all T&E buildings are less than 50 years old. As such, these buildings must be shown to be exceptionally significant. Evaluation of T&E buildings should take into account two important criteria: the importance of the building to the overall testing program; and the importance of the tests at the installation. Building 36 at NAWS Point Mugu meets both of these criteria. It was the headquarters for the entire testing program, and is associated with some of the key air weapons tests conducted by the Navy.

8.2.4 Property Type: Fire Control Buildings

A fire control building is a necessary element for a multitude of weapons tests, including missile launches, high-speed test track runs, and test detonations of high explosives. A fire control building may be described as a well-instrumented bunker. The building exists to control the firing of the test item while providing shelter for the test operators. The design of the various fire control buildings differs considerably, depending upon the nature of the tests and the danger associated with the tests.

Examples:

- *Fire control buildings associated with the four National Register*—Eligible high-speed test tracks, two each at Edwards AFB and NAWS China Lake (see Section 8.2, Weapons and Aircraft T&E which contains an entry for high-speed test tracks as a property type).
- *Fire control buildings associated with the various launch complexes at Vandenberg AFB*—Many have been determined eligible for the National Register.
- *Fire control building at Baker Complex, NAWS Point Mugu*—Determined eligible for the National Register.
- *Fire control buildings at Randsburg Wash, NAWS China Lake*—Determined eligible for the National Register.
- *Fire control buildings at various ranges at NAWS China Lake*—Determined not to be eligible for listing in the National Register because the test complex was not exceptionally significant.
- *The fire control building at NAWS Point Mugu*—Found not to qualify for listing in the National Register because it lacks integrity.

Registration Requirements

Fire control buildings may be significant in one of two areas (or both): for their association with important tests; or in the area of engineering. The fire control buildings at NAWS China Lake and Vandenberg AFB were found to qualify as contributing elements of related buildings and structures. In most cases, the focus was on the actual test structure. With the test tracks, for example, the clear focus was on the track structures; the fire control buildings were included as complementary structures which were of lesser importance than the tracks. Stated differently, the fire control buildings would likely not have qualified for the National Register except for their association with the test tracks. The same logic applies to the fire control buildings at Vandenberg AFB, which qualify chiefly for their association with the launch complexes, the focus of which were the launch structures.

Experience suggests that fire control buildings will likely not qualify for the National Register except in connection with other intact test structures, such as test tracks or launchers. The buildings have no function except in relation to some other test facility and their significance is best understood in that relationship.

8.2.5 Property Type: Drop Towers

A drop tower is a simple device, used to test the volatility of a weapon or weapon component (such as a fuze, warhead, or motor) by dropping it. The test item is hoisted to the top of a 40- to 100-foot tower) and dropped to the bottom. The drop area is typical enclosed by a concrete or steel blast protection wall.

Examples:

- *Area R Drop Tower, NAWS China Lake*—Determined eligible for listing in the National Register. Like so many other properties at NAWS China Lake, the Area R Drop Tower was actually built during World War II, but used chiefly during the Cold War.

Registration Requirements

It is not known how many drop towers exist on military installations throughout California. They are most likely to be found in the T&E and R&D bases, such as NAWS China Lake, NAWS Point Mugu, Edwards AFB, and Vandenberg AFB. The devices are simple technologically and are unlikely to be significant in terms of their engineering, unless, of course, a particularly drop tower has been fitted with important and innovative design features. Significance will more likely be attributed to the association between the tower and a particular testing program. The one known National Register-eligible drop tower, for example, was built during World War II to test the volatility, among other things, of the explosive lenses that were manufactured at the station and installed in prototype atomic bombs. It is realistic to expect an eligible drop tower to retain a very high degree of integrity.

8.2.6 Property Type: Radars for Test Ranges

The California landscape is filled with military radar installations. Most of these are Air Force-built early-warning radar units, discussed as a separate theme and property type. The missile T&E program required a substantial system of radar units, to track test firings and to ensure safety on the ranges. Radar installations are particularly common in the Central Coast area, where the Air Force and Navy have established massive arrays as part of what was called the Pacific Missile Range, now the Western Range. These arrays are also common in the Mojave Desert areas near NAWS China Lake and Edwards AFB.

The radar facilities for T&E are distinctly different properties from the early warning radar sets built by the Air Force, a property type discussed under Theme 3 (Early Warning Systems and Electronic Warfare). The technology of these and all radar sets changed very quickly during the Cold War, making it likely that any given radar installation is not more than a decade old. Building N138 is a radar building, without its antenna. It was built in 1948 at the earliest stage of the missile testing program at NAWS Point Mugu. It was found to qualify as a rare and intact (except for the antenna) example of this property type. Dozens of radar installations were found to qualify for the National Register as part of the inventory work for Vandenberg AFB, which identified a discontinuous district comprising radar units at Vandenberg and NAWS Point Mugu, several installations between the two, as well as radar units in Hawaii.

Examples:

- *Building N138, a 1949 radar installation, NAS North Island, San Nicolas Island—*Determined eligible for listing in the National Register.
- *Western Range Landbased Instrumentation Support Systems Historic District—*A discontinuous district that includes radar installations (and other instruments) at Vandenberg, Point Mugu, sites between Mugu and Vandenberg, and sites in Hawaii.

Registration Requirements

Like many Cold War property types, radar units illustrate a conflict between age and importance. As with any rapidly evolving technology, the more recent radar units are much more effective and powerful than the early units, say, those from the late 1940s. They are arguably more important in that they are more effective. A value must be assigned, however, to pioneering works as well. A 1949 radar installation, however crude by modern standards, is associated with the pioneering work in the field in a way that more recent units are not.

This property type will likely be inventoried in great numbers in the future; there simply are so many radar stations to be accounted for. The fact that there are so many radar installations calls into question how best to inventory and evaluate such properties. The four considerations mentioned earlier in this report will be useful: strength of association, rarity, integrity, and age. The N138 radar building, for example, was associated with the earliest missile tests at Point Mugu. While these tests may not have involved highly successful weapons, there is an assumed importance to the early, pioneering effort. The building retains a high degree of integrity, despite the loss of the antenna (this will almost certainly be true of any radar installation that is not actually still in use). It appears to be a very rare example of the type of radar unit installed there, and in the building form as well. Although it was 49 years old when it was evaluated for National Register listing, it is now 50 years old. That combination of factors points toward

eligibility. A more recent example of a very common radar unit may require a much higher level of proof that it was directly associated with very important tests, in order to overcome the fact that it was built in recent years and is one of many examples. Again, the emphasis should be upon directness of association, as opposed to general associations. All radar units contributed in one way or another to the success of these tests but only a few may have played direct and important roles in this respect.

The fact that early radar sets are rarely in place points to another general problem in dealing with Cold War buildings and structures: the equipment is often as important as the buildings that housed it. While an early radar tower may exist, the actual radar unit was arguably the key element of the T&E program. A similar case could be made for much of the scientific equipment that was used to develop new weapons, aircraft, and other Cold War technologies. This issue is addressed in a publication of the ACHP, *"Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities."*⁷⁵ National Register guidelines are ambiguous about how to deal with equipment that is potentially significant. Some antique railroad cars and historic ships have been listed in the National Register. Rarely, however, have small pieces of outmoded equipment been found to qualify for the National Register.

One possible solution for dealing with important equipment, at least in the short run, would be to treat it within the context of military museums rather than the NHPA. All branches maintain military museums, as do most of the major bases in California. Potentially important equipment may be suitable for museum-related curation and interpretation, particularly in relation to the mission of a specific base. NAWS China Lake has voluntarily established a program through which it offers antiquated equipment to museum staff and the base historians, before offering it to the public as surplus material. This approach is especially commendable because of the highly technical nature of the work at this, or any other "leading-edge" base. Who better than the base itself to appreciate the function and potential significance of outmoded equipment? This solution, of course, requires coordination between cultural resource personnel and museum personnel at the base, a form of coordination that would be laudable in any event.

8.2.7 Property Type: Other Facilities for Tracking and Recording Missile Tests

The test ranges were fitted with hundreds, perhaps thousands, of machines that were used to track missile tests and to record their results. These included: high speeds cameras, theodolite stations, and numerous other devices.

⁷⁵ Advisory Council on Historic Preservation, "Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities," 1992.

Examples:

- None have been found to qualify for listing in the National Register, except in relation to other facilities. (The camera stations for the high-speed test tracks at Edwards AFB have been found to qualify as contributing elements of the track operation.)

Registration Requirements

During the early Cold War, American scientists and engineers made great strides in developing an array of instruments to record the results of missile tests, from very fast cameras to a variety of tracking devices. These devices in most cases were pieces of machinery rather than buildings or structures, although they often required permanent buildings to house the machinery. See earlier comments regarding the treatment of outmoded test equipment. The efforts of the military will yield best results in dealing with this test equipment within the structure of its museum programs. An early high-speed camera, for example, is far more interesting than the box that held that camera. It is unlikely that the housings for this test equipment will individually meet the criteria for listing in the National Register. These properties may, however, qualify for the National Register as minor elements of a larger property.

8.2.8. Property Type: Facilities for T&E of Experimental Aircraft

Edwards AFB achieved international fame during the early Cold War Era for its association with flight testing of experimental aircraft. It was here that American aircraft first achieved supersonic speeds. It was also here that an entire generation of test pilots – Air Force, Navy and Marine Corps – learned how to fly these new aircraft. The work at Edwards from the late 1940s and 1950s also straddles the line between the development of very high-speed and high-altitude military aircraft and the beginnings of the Man in Space program.

Edwards AFB, more than any other base in California (and likely the United States), illustrates the blurred line between the development of military aircraft and the development of spacecraft. The Man in Space program is discussed as a separate theme below (Theme 6). In discussing significance in the development of Air Force jets, however, it is impossible to separate the roles that were played by the Army, the Air Force, and the National Advisory Committee for Aeronautics (NACA) and its successor, NASA. Edwards AFB was home to two test flight centers: the Air Force Flight Test Center, which inherited the pioneering jet flight testing program that began during World War II; and the Dryden Flight Research Center. The Dryden Flight Research Center was established by NACA in 1946 (NACA was renamed NASA in 1958, and its mission changed to focus on space flight). The Air Force was interested in the aircraft being tested by NACA/NASA, and vice-versa. The famous X-series of airplanes, from the X-1 to the X-15, were sponsored by the Air Force and NASA at different points in time. Capt. Chuck

Yeagar broke the sound barrier in an X-1 in 1947, in a test sponsored by the Air Force. In 1963, pilot Joe Walker broke the altitude record in an X-15 (over 354,000 feet) in a test sponsored by NASA. (The X-15 program was sponsored by NASA, the Air Force, and the Navy.)

Rogers Dry Lake was designated a NHL as part of the NPS Man in Space Theme Study.⁷⁶ The flights of the X-1 and X-15 are called out as the basis for NHL status within the context of the Man in Space program. The same flights could be considered as equally significant within the Air Force jet aircraft program. This fact underscores the conceptual difficulties in evaluating the significance of properties at Edwards AFB; it also underscores the significance of those properties.

Examples:

- *Rogers Dry Lake, Edwards AFB*—Listed as a NHL.
- *Building 4305, Edwards AFB*—A remote hangar for storing experimental aircraft, determined eligible for the National Register for its role in the secret testing of various aircraft, including the U-2.
- *Hangars 1 and 2 and Building 4500, Edwards AFB*—A control tower, found to meet the National Register criteria.
- *An engine test complex for the X-15, Edwards AFB*—Found to meet the National Register eligibility criteria.

Registration Requirements

Although there are likely other properties that illustrate this theme, the theme is best exemplified by properties at Edwards AFB, which was the principal facility nationwide and which was used by pilots from various branches. As discussed elsewhere in this report, Edwards AFB has for nearly a decade pursued Cold War studies with diligence and thoroughness that can serve as a model for Cold War studies nationally.

The Edward inventory program has focused chiefly on its early high-speed test tracks and its important propellant laboratory and test facility. Although the flight test theme has been studied, it appears that the base has not approached the task in the same comprehensive and thematic manner in which it has conducted the aforementioned work in test track and propellants. The flight test program at Edwards AFB was so important that it should be treated with the same care as the other thematic studies: preparation of a detailed historic context, including identification of

⁷⁶ Harry A. Butowsky, *Man in Space National Historic Landmark Theme Study, Phase II*. National Park Service, 1984.

expected property types, followed by a comprehensive inventory of properties associated with that theme.

8.3 THEME 3: EARLY WARNING SYSTEMS AND ELECTRONIC WARFARE

Radar was one of the great inventions that derived from R&D by the Allied Forces during World War II. Although crude radar devices were in use prior to the attack on Pearl Harbor (including devices at Oahu), the technology was effectively invented during the war and perfected during the Cold War. Cold War research in radar was leading edge work and was given a very high priority by all branches, particularly the Air Force. This work resulted in the application of two very different types of radar-related facilities in California: early warning systems to detect incoming aircraft; and electronic warfare facilities, dedicated to research and training in the complicated processes of radar-jamming (counter measures), anti-jamming (counter-counter measures), anti-anti-jamming (counter-counter-counter measures), and so forth, in a high technology cat-and-mouse game involving aircraft and ground radar units.

Between 1946 and the early 1960s, the Air Force undertook the development of an effective early-warning system to alert the military, first of enemy (presumed to be Soviet) bombers, and later of ICBM attacks. Arguably the most lasting contribution of this effort was SAGE computer, which many maintain was the first truly operational mainframe computer in history. The long history of this program resulted in construction of numerous different types of buildings and structures, scattered throughout the United States and in foreign nations as well, particularly Canada, which was a partner in North American Air Defense (NORAD).

There exists an excellent nationwide context for the early warning system, including radar sets, SAGE and related buildings, and other properties associated with this theme. The system was built around complex group of resources: the SAGE centers, which were buildings for the computers and their operators; the vast radar arrays that fed data to the computers; and SAC facilities (both planes and missiles), which were set to attack incoming aircraft or missiles in response to data from the SAGE centers, and to mount retaliatory raids on the nation that had mounted the attack.

By contrast, electronic warfare (EW) has not been studied extensively from the standpoint of cultural resources. There is not a nationwide context and none of the inventories of California high-technology bases has studied this subject in detail. It appears that EW is a growing field for R&D and T&E on California military bases and a subject that should be addressed in future cultural resource inventories.

8.3.1. Property Type: SAGE Control Centers

Within the hierarchy of radar-related buildings and structures, the SAGE Control and Direction Centers were the most important and interesting from a structural standpoint. These buildings were heavily fortified, with six-foot concrete walls, built around an interior 12-inch wall.⁷⁷ The SAGE was a link between radar surveillance, anti-aircraft response to incoming bombers, and the scrambling of American bombers for retaliation. For a brief period of time, the SAGE system was at the heart of American response to a Soviet nuclear attack. The heavy reinforcement of the SAGE building signifies the importance that was attached to its function and the need to protect the computer, which was at the core of its operation.

The SAGE program was arguably more important to the development of the computer industry in the United States than it was in national defense. General literature on the development of the computer industry emphasizes that the SAGE computer was a key milestone in development of the first mainframe computers. Developed chiefly by scientists from the Massachusetts Institute of Technology (MIT), the computer was built by the International Business Machines (IBM) Corporation. Work on this computer helped solve many of the most difficult data storage and transfer problems that had delayed introduction of useful mainframe computers.⁷⁸

Examples:

- *SAGE Control and Direction Building at Beale AFB*—Inventoried and found not to qualify for listing in the National Register.
- *SAGE Control and Direction Building at Norton AFB*—Apparently not inventoried or evaluated.

Registration Requirements

Only two SAGE control buildings were constructed in California. The Beale AFB building was inventoried and found not to qualify for listing in the National Register. There is no indication that the SAGE building at Norton AFB was inventoried or evaluated. The SAGE buildings were arguably the most crucial elements of the early warning and retaliation program developed by the Air Force in response to possible attack by enemy bombers.

⁷⁷ David F. Winkler, "Searching the Skies: The Legacy of the United States Cold War Defense Radar Program," Prepared for the United States Headquarters Air Combat Command, 1997, 43.

⁷⁸ The importance of the SAGE project in computer history is recognized in numerous sources, including: Kent C. Redmond and Thomas S. Smith, *Project Whirlwind: The Story of a Pioneer Computer*. Bedford, MA: Digital Press, 1980. Project Whirlwind was a Navy project that the Air Force essentially took for its own as a foundation for the SAGE system.

The SAGE control buildings were massively reinforced, fallout protected buildings that were as much bomb shelters as control buildings. Although no such building has been formally evaluated in California, the general character of the design is known from inventories elsewhere. The architectural character of the building is defined by its utilitarian function – the massive inner and outer walls of reinforced concrete. With respect to integrity, a SAGE building should retain two qualities: structural and architectural integrity. It is unlikely that the structural aspects of the building could be modified extensively, simply because it was so sturdily built at the outset. It is possible, however, that the appearance of the building could be modified through the addition of architectural elements that are out of keeping with its original utilitarian design.

Given the fact that only two SAGE buildings were built and their importance to the air defense system, the buildings would appear to have a good probability for listing in the National Register, provided they retain integrity.

8.3.2 Property Type: Backup Interceptor Center (BUIC) Buildings

A secondary facility associated with SAGE was the BUIC, which, as its name implies, served as a back up to the SAGE Command and Control centers. According to a general context on the development of the SAGE networks, no BUIC centers were built in California. BUIC centers were built to essentially the same standards as SAGE buildings, with very thick exterior walls, built around a thinner interior wall.

Examples:

- No BUIC properties have been identified in California, apparently because none were ever built.

Registration Requirements:

It is possible but unlikely that a BUIC building will be identified in California. These, which are apparently more rare than the SAGE buildings, should be evaluated in the same general context and with the same registration requirements as SAGE buildings, including preservation of the utilitarian architectural character of the fallout-resistant design.

8.3.3. Property Type: Major Radar Arrays

In addition to the major SAGE control centers, the early warning system was built around dozens of radar arrays, placed strategically throughout the state and the nation, which could feed data to be processed by the SAGE computers. (The SAGE and BUIC centers usually had radar installations nearby, adding to the completeness of coverage.) The Air Force radar context

indicates that 23 such arrays were built in California between the late 1950s and late 1960s. Only a few of these properties have been inventoried or evaluated. The only known inventory efforts were made by NPS, which investigated two sets of radar arrays it inherited from the Air Force when the land under the arrays was deeded to NPS after the system was abandoned.

Examples:

- *Klamath Air Force Station*—Inventoried, but not evaluated.
- *Mill Valley Air Force Station*—Determined eligible for listing in the National Register.

Registration Requirements

It is not known how many of the 23 early warning radar arrays built in California still exist or exist on Air Force land or other DoD land (many were built on Army and Navy bases). To complicate matters, there was a great variation in the types of radar towers and units that were installed, as the Air Force experimented with different design. To complicate the situation still further, many of these installations were taken over by the Federal Aviation Administration (FAA) and fitted with new equipment.

So few of these installations have been inventoried that it is difficult to address either significance or integrity of these properties. As noted, there exists a nationwide context, “Searching the Skies,” that addresses the importance and rarity of different generations of NORAD-related radar sets. The context suggests two points pertinent to evaluation of these units. First, there was a variety of such units installed as the Air Force experimented with new technologies. The locations of the different generations of these arrays are laid out in that document. Second, it is unlikely that any of the original radar units is still in place; all or nearly all have been replaced as the older units wore out or were made obsolete by new technologies.

In general, this is an untapped area of research, inventory, and evaluation. Preliminary research suggests that it is unlikely that a major radar unit would be intact, including the radar unit itself. It is possible, however, that there are buildings that were constructed to house such a radar array; the radar units were so huge in many instances that they required very large buildings to support them.⁷⁹ The building was more than a foundation; in most cases, the radar screens and computers were stored in the building below. The possibility is much greater that a building of this sort will be found on an active military base in California. If the building is found to have supported an

⁷⁹ A radar building was inventoried at NAS Fallon in Nevada. It was found to qualify for listing in the National Register but as part of a larger property that includes an intact BUIC building, as well as related buildings (a fallout shelter, guard shacks, and back up generator). JRP Historical Consulting Services, “Inventory and Evaluation of National Register Eligibility for Cold War-era Buildings and Structures, Naval Air Station, Fallon,” September 1998.

important radar set and the building itself retains integrity to its original appearance, the possibility exists the building could be found to qualify for the National Register.

8.3.4 Property Type: PAVE PAWS Facility

In the mid-1970s, the Air Force began construction of a series of large phased-array radar facilities, PAVE PAWS. Designed to warn of Soviet ICBM and submarine-launched ballistic missiles, the PAVE PAWS was, in some respects, the ICBM-oriented successor to the SAGE system of the 1950s. It was also similar to SAGE in that it was as much a computer system as a radar array, and posed enormously complex computational obstacles. The first two PAVE PAWS were installed at Cape Cod in Massachusetts and at Beale AFB in California, between 1977 and 1980. The PAVE PAWS at Beale AFB is shown in Figure 36.

Examples:

- *PAVE PAWS facility, Beale AFB*—Inventoried and evaluated and found to meet the criteria for listing in the National Register.

Registration Requirements

The PAVE PAWS at Beale AFB was the only such facility built in California and it has been inventoried and evaluated. The evaluation of this building, or actually a complex of buildings and structures, illustrates the relationships among the four major considerations for National Register eligibility for Cold War properties: directness of association, rarity, integrity, and age. The Beale AFB PAVE PAWS is surely directly associated with a system of great national importance and is a rare example of it, both of which work in favor of eligibility. Age and integrity, however, must be considered as well. A system of this magnitude and importance is regularly upgraded and improved. In addition, the recent construction of the property brings it to the final years of what is commonly called the Cold War.

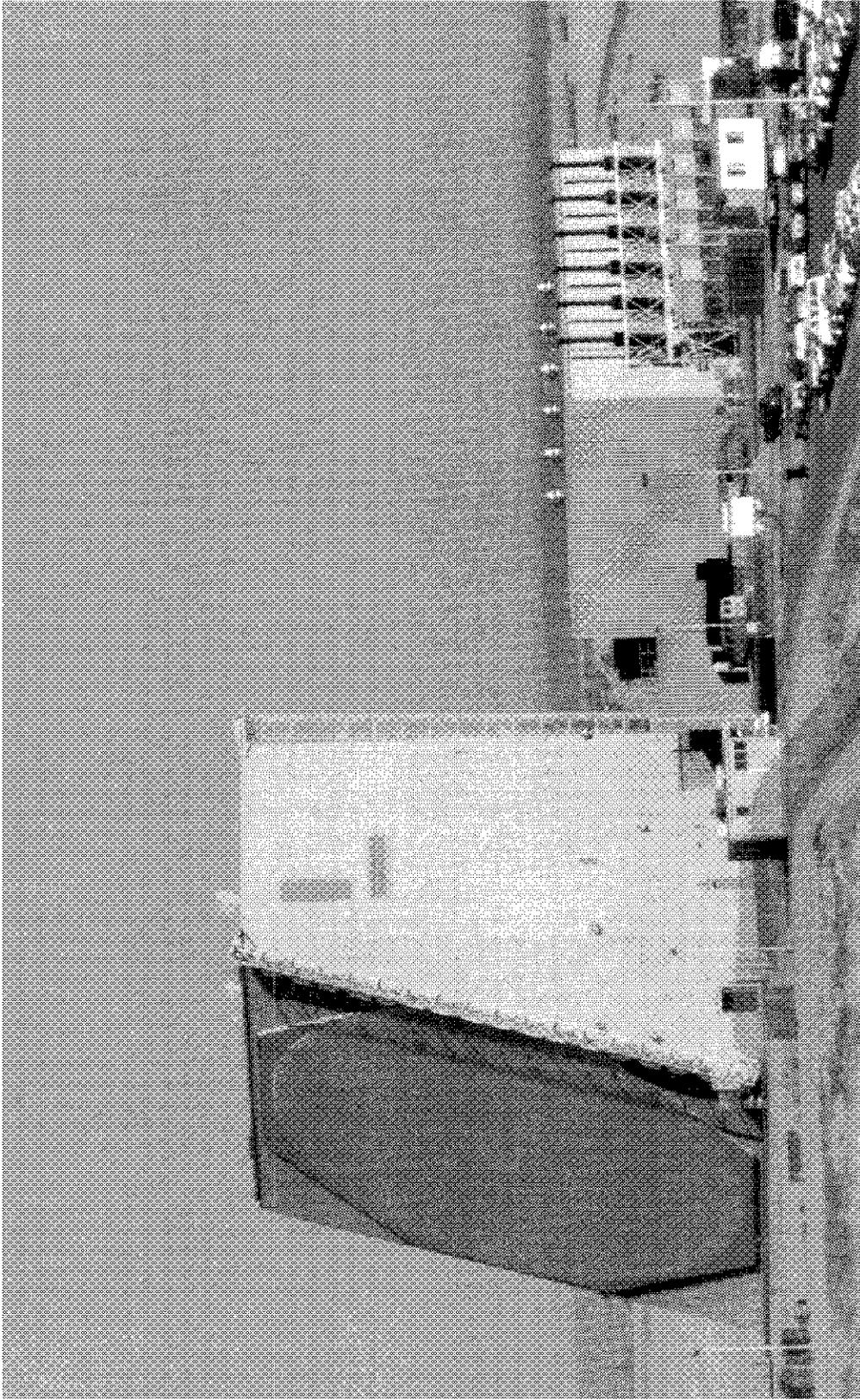


Figure 36. Perimeter Acquisition Vehicle Entry Phased Array Warning System (PAVE PAWS) at Beale AFB. (Source: the National Archives.)

8.3.6 Property Type: Electronic Warfare Facilities

The term, “electronic warfare,” or EW, came into use early in the Cold War, to refer chiefly to electronic eavesdropping and radar-jamming operations. In 1969, the Joint Chiefs of Staff defined the term as a “military action involving the use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum and action which retains friendly use of the electromagnetic spectrum.”⁸⁰ This broad definition encompasses not only a variety of utilities but also the entire electromagnetic spectrum, from very low frequencies through microwave and infrared bands. EW is most commonly associated with radar, including countermeasures (jamming) to counter-counter-measures (efforts to thwart jamming operations). The term also applies to electronic surveillance of all sorts, as well as the basic combat command structure, often called C3 – command, control and communications.

The research interests are so broad that most high-technology bases in California have been involved in EW research. The basic tools – radar, radio communication, and so forth – have been studied throughout the Cold War at bases like NAWS China Lake and SSC San Diego. EW is one of the most active areas of R&D and T&E on military bases in California today. The field, as noted, is very large, and in its broadest definition, includes almost any application of electronics to warfare.

Examples:

- No known EW-related building or structure on a California base has been found to qualify for the National Register. Many facilities have been found to qualify for their roles in R&D and T&E on EW-related technologies – radar, missile guidance, and the like. It is difficult to assess the situation, given the very broad definition of this field.

Registration Requirements

It appears that EW is one of the more important growth areas for California military bases, today and probably into the future. This is an essentially untapped research field, at least with respect to cultural resource identification and evaluation. This fact may be explained in part by the recent years in which this work has been conducted. It may also be explained by the highly secretive nature of the work.

⁸⁰ Neil Munro, *The Quick and the Dead: Electronic Combat and Modern Warfare*. New York: St. Martin's Press, 1991, 91.

At some point in the future, it is likely that Californians will be able to appreciate the pioneering EW work done by the military in California, just as we are now able to perceive the importance of work in missile testing, high-speed test track development, and many other fields.

8.4 THEME 4: STRATEGIC NUCLEAR CAPABILITIES

Prior to the development of ICBMs (Section 8.5), the American nuclear capabilities were restricted to long-range bombers. Effectively, it was SAC that embodied the American nuclear retaliation capabilities. Throughout the Cold War, but particularly in the late 1940s, 1950s, and early 1960s, SAC was entrusted with the primary responsibility for carrying out the threat of “massive retaliation,” seen as the first line of deterrence to a nuclear attack by the forces of the Soviet Union. However hard the United States worked to develop defensive tools, such as the early warning system, air defense system, and later the antiballistic missile, it was the threat of retaliation that was seen as deterring a nuclear attack on the United States.

SAC’s mission was nuclear from the outset. Although the SAC bases were connected through a sophisticated series of communication links with other facilities, the needs of a SAC base were relatively simple. It required hangars for the massive intercontinental bombers and it required an area to store nuclear weapons.

8.4.1 Property Type: SAC Hangars

SAC hangars differed from other Air Force or Navy hangars because the aircraft they housed were very different. SAC squadrons initially relied upon the B-29. The B-36 was the first aircraft designed specifically for SAC use and it first became available in 1950. By the late 1950s, these were replaced by the B-52. The SAC hangars were large enough to accommodate the specific aircraft and were fitted with motorized side-recessing doors for rapid access. Their designs were specific to the function; the SAC-type hangars were built only for SAC.

Examples:

- *Building 810 at Travis AFB*—Built in 1951 as an early B-36 hangar. Found to meet the criteria for listing in the National Register.

Registration Requirements

The National Register eligibility of Building 810 illustrates the manner in which exceptional associations can determine eligibility for an example of an otherwise common property type. There exist in California hundreds of Cold War-era hangars on Air Force and Navy bases. It appears that Building 810 is the only Cold War-era hangar that has been inventoried, evaluated and found to meet the criteria for listing in the National Register. The exceptional significance

for this building relates to its direct association with the exceptionally important theme of massive retaliation. It is possible that other hangars were also directly associated with this theme. The eligibility document for Building 810 may be used as a way of testing the directness of association for any newly-discovered buildings thought to be significant for their association with this theme.

8.4.2 Property Type: Nuclear Weapons Magazines

Throughout the Cold War, control of nuclear weapons was accomplished through a complex relationship involving the Department of Energy (successor to the Atomic Energy Commission), the Sandia Corporation (which had exclusive manufacturing contracts for these weapons), and the military branch that was assigned the weapons.

In terms of bombs (as opposed to large missiles with nuclear capabilities), storage was always associated with a SAC base; only SAC planes were capable of intercontinental delivery. The SAC storage facilities were called AFSWP Q Areas, for Air Force Special Weapons Project. The “Q” related to a very high level of security clearance.⁸¹ There were never many Q Areas nationwide. The first group included only five, one of which was at Travis AFB in California. The SAC squadrons from Travis AFB moved to Beale AFB in the late 1950s. It is not known whether the Q Area function moved with the aircraft; logic suggests some types of magazines were built to support the SAC squadrons.

Examples:

- *AFSWP Q Area, Travis AFB*—Inventoried and found to qualify for listing in the National Register, specifically the nuclear (special weapons) storage area at Travis AFB.

Registration Requirements

As with the Travis AFB hangar, the magazines at Travis illustrate how exceptional associations can contribute to eligibility for a common property type. Hundreds, perhaps thousands, of Cold War-era magazines exist in California (although many may have been built during World War II). It appears that, to date, the AFSWP Q Area at Travis AFB is the only group of magazines found to qualify for the National Register for Cold War significance.

The question arises: could other magazines qualify in a similar context? It is not known whether other Q Area magazines exist. If so, they would likely be found at March, Castle, Mather, or

⁸¹ Geo-Marine, Inc. “Travis Air Force Base, Fairfield, California: Inventory of Cold War Properties,” October 1996. Report Number 7, United States Air Force Air Mobility Command Cold War Series. This excellent inventory document also provides a detailed history of the entire SAC program.

Beale bases, the other SAC facilities in California. Any additional Q Area magazines should be evaluated in the same manner and context as the magazines at Travis AFB.

8.5 THEME 5: ICBM AND ABM MISSILE INSTALLATIONS

Californians played a very important role in the development of ICBMs, intermediate range ballistic missiles (IRBMs), as well as various anti-ballistic missile (ABM) devices. This work was accomplished (as was most Cold War-era weapons work) through a cooperative arrangement among the military, California universities, and California-based corporations. This work began early during the Cold War Era and continues today. Californians were also at the forefront in work on closely-related fields, including the launching of communications satellites and the launching of space vehicles (Section 8.6).

Californians were heavily involved in the R&D and T&E of ICBM and ABM missiles. To a lesser extent, Californians participated in the staging (i.e. actual deployment) of the missiles, which were more often deployed in the Midwest. The earliest attempt at developing an ICBM was the Air Force Boeing and Michigan Aeronautic Research Center (BOMARC), which was never deployed in California. The first successful land-based ICBM, the Atlas, was an entirely California product, having been built in San Diego and tested at Vandenberg AFB. The first Atlas missiles were deployed at Vandenberg. The third generation of ICBMs, the Titan family, was deployed at Vandenberg AFB and Beale AFB. The Minuteman missile, of which thousands were deployed, was never stationed in California; all were installed in the Midwest or South.⁸² IRBMs were not deployed in the United States, their range of about 1,500 miles rendered them useless except when forward deployed. Most IRBMs were deployed in Europe. The evolution of ICBM launchers is illustrated in Figure 37.

The history of the development of these large missiles is exceedingly complex for three reasons. First, the technology typifies “leading-edge” work; if there was an aspect of the military history of California that typified high technology, it was work on the ICBMs. Second, although the Air Force was clearly the leader, both the Army and Navy participated in this work, in California and elsewhere, as did universities and private industry. The program was so huge that it involved dozens of bases and private industry sites. Third, the context for the ICBM program blends and merges with the Man in Space program; the two shared facilities as well as basic large missile technologies.

⁸² John C. Lonnquest and David F. Winkler, “To Defend and Deter: The Legacy of the United States Cold War Missile Program,” USACERL Special Report 97/01, November 1996.

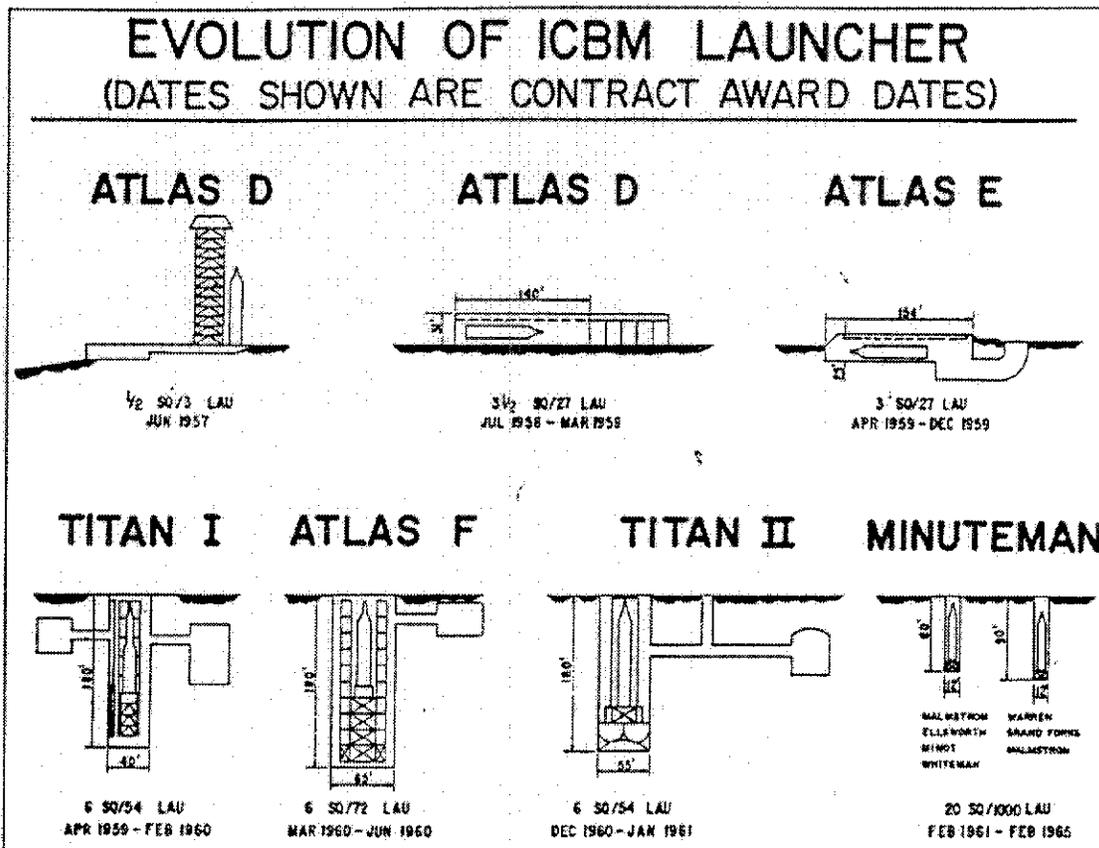


Figure 37. Evolution of ICBM Launchers. These complex structures are better understood in section than in person. This drawing is taken from "To Defend and Deter," a nationwide context for the missile programs of the Army and Air Force.

The discussion below is necessarily simplified. The comments on registration requirements address the need for a comprehensive inventory of ICBM and Man in Space sites in California, including a context that does justice to the huge technological and other challenges that were faced and overcome during this long program.

8.5.1 Property Type: Atlas Missile Sites

As noted, the Atlas was the first successful land-based ICBM and was first installed at Vandenberg AFB in 1959. No other Atlas base in California has been identified. Although its use was short-lived (the missile was taken out of service in 1965), it is regarded, in the words of Lonquest and Winkler, “as the proving ground for many new missile technologies.”⁸³ The missile had a substantial connection with California. It was manufactured by Convair at its plant in San Diego and was first based and tested at Vandenberg AFB. The Atlas was stored in a horizontal position within a building, and lifted into an upright position by a crane before being fueled and fired (see Figure 38).

Examples:

- *Atlas Missile launch complex at Vandenberg AFB*—Determined eligible for listing in the National Register.
- *Air Force Plant 19, San Diego, where Convair built the Atlas missiles*—This plant is now owned by the Navy, as the headquarters for SSC San Diego. It was a World War II-era government-owned, contractor operated (GOCO) bomber plant. The property has been inventoried and found not to qualify for listing in the National Register.

Registration Requirements

It appears that the Atlas complex at Vandenberg AFB was the first deployment of this missile and the only such deployment in California. If other complexes are discovered, they should be evaluated in the same context as the complex at Vandenberg.

The entire ICBM program poses enormously complex issues in terms of inventory and evaluation methods. Three major issues need to be resolved. First, whether it is appropriate to evaluate all of the ICBM resources—Atlas, Titan, Minuteman—within the same context, or whether these missile systems are sufficiently distinct as to warrant separate treatment. A second issue relates to how to assess exceptional significance for these very rare but also very young properties. A third issue concerns the close connection between the ICBM program and the Man in Space

⁸³ Lonquest and Winkler, 209.

program. NASA and the Air Force, for example, cooperated closely in work on the Titan and Saturn missiles, which shared many elements and were tested at the same group of bases, including Vandenberg AFB. A fourth issue is simply a matter of bookkeeping: how to keep track of the various ICBM properties (as well as other missile systems tested at the major installations) that have been inventoried and evaluated to ensure some degree of consistency in the application of registration requirements?

These issues could be resolved with a context study of the ICBM program in California. There exists an excellent nationwide context for Army and Air Force missiles.⁸⁴ There is also a nationwide context for the Man-in-Space program.⁸⁵ Finally, there exist various inventories of Vandenberg AFB, Edwards AFB, NAWS Point Mugu, NAWS China Lake, Beale AFB, and other California installations involved in missile T&E. Missing is a California context that treats these various installations as a group. There is little doubt that California bases were at the forefront in the development of the ICBMs as well as other missile types, including those used in the space program. Properties at Vandenberg and Edwards AFB have been listed in the National Register for their associations with both the ICBM program and the Man in Space program, with some of the same properties apparently being designated in both areas. Due to the multiplicity of resources, the overlap of ICBM and space launch resources, and the inherent technical complexity of the subject matter, this issue deserves to be treated in a reasoned and careful contextual study, specific to the California bases, but informed by trends nationwide.

8.5.2 Property Type: Minuteman Missile Sites

In the estimation of Lonquest and Winkler, the Minuteman I, introduced in 1962, and the Titan II, introduced in 1963, represented a major step forward in ICBM design, ushering in a “second generation” of such missiles.⁸⁶ Both missiles were tested at Vandenberg AFB and substantial remnants of both testing programs still exist there. There were many generations of the Minuteman; missiles of this family are still being tested at Vandenberg and elsewhere. The launch facilities differ from one generation to the next, but generally include huge concrete launch tubes and related underground equipment and control buildings.

Examples:

- *Seven Minuteman Launch Facilities at Vandenberg AFB*—Found to qualify for listing in the National Register.

⁸⁴ Lonquest and Winkler, “To Defend and Deter.”

⁸⁵ Dr. Harry A. Butowsky, *Man in Space: National Historic Landmark Theme Study*. National Park Service, 1984.

⁸⁶ Lonquest and Winkler, 119.

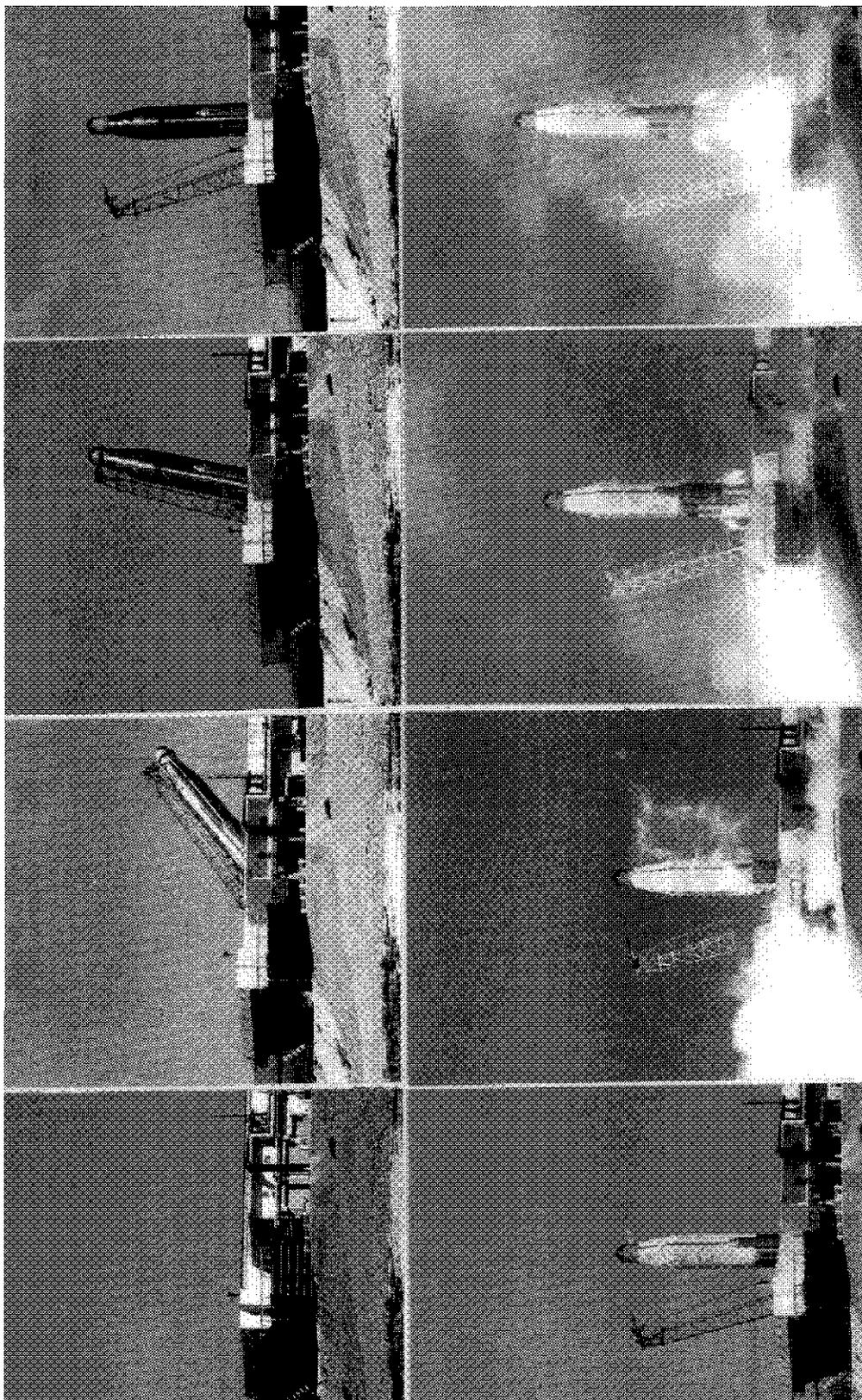


Figure 38. Launching of an Atlas missile at Vandenberg AFB, 1960. The missile was stored horizontally and hoisted to vertical before launching. (Source: the National Archives.)

Registration Requirements

See Registration Requirements for Section 8.5.1 (*Atlas Missile Sites*).

8.5.3 Property Type: Titan Missile Sites

Throughout the Cold War, the Air Force developed and tested several generations of Titan missiles. The short-lived Titan I was operational only between 1962 and 1965. The Titan II, however, was operational between 1963 and 1987. Both the Titan I and II missiles were tested at Vandenberg AFB. The Titan I was an improvement on the Atlas missile and was introduced in 1954. The Titan II was an improvement on the Minuteman.

Titan I missiles were deployed at two locations in California: at Vandenberg AFB and in the vicinity of Beale AFB. There were three Titan silos in each instance. The three Beale AFB sites were off-base, near Chico, Lincoln, and Live Oak; California; these have all since been transferred to private ownership.

The Titan II was the largest ICBM ever built by the United States. It also required one of the most permanent sets of launching structures ever associated with a missile system. Where the Titan I and Minuteman were launched outside their silos (elevators brought them to a launch position), the Titan II was launched inside its silo. The structural implications of this latter fact were significant. The missile stood at 108' tall and weighed 330,000 lbs. To launch this monster from an underground silo required a "super hardened" concrete casing as well as an elaborate venting system. The silo was also blast- and fallout-protected. The resulting structure was an amazing piece of engineering and concrete construction. The Air Force built 54 Titan II silos nationwide, three of which were (and are) at Vandenberg AFB and three of which were near Beale AFB. Of these three, Complex 395-C retains a very high degree of integrity and is open for public inspection.

Examples:

- *Titan ICBM silos near Beale AFB*—Apparently not inventoried or evaluated. These missile silos were controlled by Beale personnel but located at distant locations in Chico, Lincoln, and Live Oak.
- *Titan II Launch Complex 395-C, Vandenberg AFB*—Found to qualify for listing in the National Register.

Registration Requirements

It appears that the Titan I silos near Beale AFB and at Vandenberg AFB, and the Titan II silos at Vandenberg AFB are the only such installations to have been built in California. See Registration Requirements for Section 8.5.1 (*Atlas Missile Sites*) for additional comments.

8.5.4 Property Type: Sites for MX and Other Recent ICBM Missiles

The 1972 Strategic Arms Limitation Talks (SALT) treaty limited the number of ICBM missiles the United States and Soviet Union could deploy, but did not limit the number of warheads that could be installed on any given missile. Almost immediately, both sides sought ways to exploit that loophole by developing multiple-warhead ICBMs. The MX, or Peacekeeper, was the American answer to that challenge. Funding for the MX was approved in 1974, although the project was delayed through indecision over how to base the weapons. Improved Soviet missile guidance systems raised the fear that the Soviets would simply target American ICBMs as a first strike, leaving America unable to respond. In their plans for the new Peacekeeper, Americans explored various plans, including moving the missiles around on railroad cars from site to site, forcing the Soviets to target every conceivable site to which a missile could be moved. This Rail Garrison approach, as it was called, was tested at Vandenberg AFB, but was never implemented elsewhere.

Examples:

- *Rail Garrison Historic District, Vandenberg AFB*—Found to qualify for the National Register.

Registration Requirements

See Registration Requirements for Section 8.5.1 (*Atlas Missile Sites*).

8.5.5 Property Type: ABM and Nike Missile Sites

American scientists (and scientists in Great Britain, the Soviet Union, and elsewhere) spent much of the Cold War contemplating one of the most vexing challenges: how to intercept a missile, particularly a ballistic missile, after it has been launched? The question was first posed during World War II, as German V-2 ballistic rockets rained down on Great Britain. To this day, the question has not been answered satisfactorily and was at the heart of debates in the 1980s over the so-called “Star Wars” defense program and 1990s proposals to revive part of it.⁸⁷

⁸⁷ The long program to develop an antiballistic missile defense system is detailed in Lonquest and Winkler, Chapter 10. The program is also outlined and discussed in cultural resource inventories for Vandenberg AFB.

The preferred solution for the Air Force and Army during the early Cold War was development of an anti-missile missile, i.e., a missile that could intercept and destroy an-incoming ICBM. The two branches, however, took very different approaches, with the Air Force hoping to develop a unique weapon for this purpose and the Army hoping to transform its Nike missiles to intercept missiles.

The Air Force's early ABM weapon was named BOMARC, for the developers of the weapon. Like Nike, BOMARC was initially seen as an anti-aircraft weapon but was later seen as having ABM potential as well. Although the propulsion system for this missile was built in Southern California, the weapon was never based in California.

The Nike, first developed in 1945, went through various generations: Nike Ajax in the early 1950s, Nike Hercules in the mid-1950s, and later the Nike Zeus and Nike X. The Nike missiles were designed as anti-aircraft weapons and it appears that all Nike installations in California were built for that purpose, not as ABMs. California installations were involved, however, in the R&D and T&E to adapt a Nike for ABM purposes. The first successful interception of an ICBM by a Nike occurred at Vandenberg AFB in 1962, when a Nike Zeus intercepted an Atlas ICBM.⁸⁸ The Nike X was tested as a primary ABM missile throughout the 1960s. In the late 1960s, the Army proposed construction of strategically sited "Sentinel" systems, built around the Nike X, including two in California. SALT, begun in 1969, short-circuited deployment of this system.

As noted, the different generations of Nike had been developed initially, not as ABMs but as anti-aircraft missiles with a relatively short range. Soviet advances in ICBM technologies changed American thinking about how the Soviets were likely to deliver an air attack. Most of the anti-aircraft Nike bases were closed in the early 1960s.

Examples:

- *Nike Zeus antimissile missile facility, Travis AFB*—The missiles were located at Elmira (seven miles from Travis; these have not been inventoried or evaluated). Buildings 373 and 377 at Travis AFB found to qualify for the National Register as assembly buildings for the Nike missiles.
- *Nike missile sites, Fort MacArthur, Los Angeles County*—Inventoried in 1987, but not formally determined eligible.
- *Nike missile sites, Angel Island*—Owned by the State of California as a State Historic Park.

⁸⁸ Lonquest and Winkler, 110.

- *Nike missile sites throughout the state*—In areas not controlled by DoD and apparently not inventoried or evaluated. Many of these are identified by Lonquest and Winkler as “intact.”⁸⁹

Registration Requirements

The Lonquest and Winkler national context, “*To Defend and Deter*,” lists dozens of Nike missile sites in California. Four are on land controlled by DoD, as regular military bases or as reserve sites. These sites are identified by number as follows: 576-D at Vandenberg AFB; LA-32, controlled by the California Army Air National Guard; LA-14, controlled by the Army Reserve; LA-96, controlled by California Army Air National Guard. Many other sites are on Federal land, either administered by NPS or the U.S. Forest Service. Still others are owned by various agencies of the State of California. Because there are so many Nike sites owned by the Federal government and the State of California, it is highly likely that the California Office of Historic Preservation will have reason to consider eligibility for these properties, under state or Federal law.

The only known Nike ABM installation was at Travis AFB, although it is quite possible that others were installed as well. The Nike ABM installations were the province of the Army, but could be placed at Air Force, Navy, or Army bases or on off-site land, land that may now be privately owned. It appears that the Nike ABM installations are far more rare than the Nike anti-aircraft installations. None have been inventoried to date. If more are identified and evaluated, including the Elmira facility near Travis AFB, these should be treated as having good potential for meeting the National Register criteria.

8.6 THEME 6: MAN IN SPACE SITES

Throughout the Cold War, the line blurred between missile research, particularly work on ICBMs, and the nation’s space program. Virtually every California military base that was associated with the ICBM program was also associated with the early efforts of NASA.

The Man in Space program grew naturally and without internal conflict from the military’s rocketry program and, to a lesser degree, from its jet aircraft program. Following the successful launch of the Soviet Sputnik in 1957, the United States made the space program a high priority. Responsibility for this work was assigned first to NACA, and then to its successor, NASA. The space program-related resources and ICBM-related resources are often found together on the same bases and in the same areas of those bases. Indeed, many test items—propellant test stands,

⁸⁹ Lonquest and Winkler, 466-472.

high-speed test tracks, and others—were used to test components for both programs. Similarly, the NASA Man in Space program grew from the experimental aircraft studies and tests at Edwards AFB. The Man in Space program also benefited from a host of other technological innovations that were of military origins. These included advances in satellite communications, devices for satellite tracking, wind tunnel testing, high-speed track testing, and a host of other advances.

In general, the Man in Space program has not been studied in the kind of detail with which specifically military resources have been inventoried and evaluated. The bedrock inventory and evaluation document was NPS's "*Man in Space National Historic Landmark Theme Study*."⁹⁰ This NHL designation includes five California sites: Rogers Dry Lake at Edwards AFB, Space Launch Complex 10 at Vandenberg AFB, Pioneer Deep Space Station at Fort Irwin, the Unitary Plan Wind Tunnel at Moffett Field, and the Twenty-Five Foot Space Simulator at the Jet Propulsion Laboratory, operated by Caltech.

While it is very useful, the NPS study cannot be substituted for a comprehensive inventory for two reasons. First, it is an NHL study, applying the NHL standards, which are far more rigorous than National Register eligibility criteria. Second, it was a broad national survey effort and did not investigate properties at individual bases with the kind of comprehensive program that is required to yield reliable results for National Register eligibility.

The studies of individual bases associated with the Man in Space program have supplemented the work of NPS and have identified numerous National Register properties not included in the NHL Theme Study. This work has progressed well, but is far from complete. As a matter of equity and efficiency, the task of inventorying these properties should fall to NASA, not the military. Although NASA operates from military bases in many instances, NASA is directly responsible for managing these resources. NASA also has the technical expertise to participate in evaluating significance for these highly technical resources. This theme represents an excellent candidate for a major thematic study; one that applies National Register criteria, rather than NHL criteria.

8.6.1 Property Type: Runways for Experimental Aircraft, Including Spacecraft

The earliest testing of experimental aircraft was conducted at Muroc AAFB, later named Edwards AFB. The Air Force, private contractors, and the early NACA/NASA staff all used the facility for testing winged aircraft capable of very high speeds.

⁹⁰ Harry A. Butowsky, *Man in Space National Historic Landmark Theme Study, Phase II*. National Park Service, 1984.

Rogers Dry Lake was listed in the National Register as part of the Man in Space NHL Theme Study. It was listed for its role as a landing area for experimental spacecraft. The property is equally significant for its earlier (and continuing) role with regard to testing of military aircraft. Rogers Dry Lake is a special case within the universe of Man in Space properties. It was used by the Air Force long before it was used by NASA (long before there was even a NASA). Its place in the history of NASA is unusual. It was important in the early years, in which NASA was interested in high altitude jet aircraft like the X-15. The X-15 is credited with pointing the way to the design of a reusable, airplane-like spacecraft, such as the modern Space Shuttle. Rogers Dry Lake also serves as a back-up landing strip for the shuttles. Edwards AFB has proceeded diligently to inventory all resources at the base, many of which have contributed to the Man in Space program.

Examples:

- *Rogers Dry Lake, Edwards AFB*—Listed as an NHL and listed in the National Register.

Registration Requirements

It is unlikely that another resource will be identified that ranks with the Rogers Dry Lake as an example of this theme. In the early years of the experimental flight program, the Air Force apparently used Fort Irwin as an alternate test site and it is possible that there exist properties at Fort Irwin that might also need to be evaluated as an example of this property type.

8.6.2 Property Type: Deep Space Listening Devices

Communication and tracking were especially difficult problems during the early years of the American space program. This technology has changed as rapidly as the space program generally, leaving behind many generations of early facilities designed for this purpose. The Goldstone Deep Space Station was the only property of this sort to be designated under the NPS' *Man in Space National Historic Landmark Theme Study*. A subsequent inventory of properties at Fort Irwin expanded the designation slightly by including three support buildings for the dish.

Examples:

- *Pioneer Deep Space Station, Goldstone, Fort Irwin*—An NHL associated with Man in Space Theme Study.
- *Three support buildings associated with the Pioneer Deep Space Station, Goldstone, Fort Irwin*—Determined eligible for the National Register.

Registration Requirements

The Pioneer Deep Space Station, a NHL, is a prime example of an eligible property: it was directly associated with the earliest space flights, it retains a high degree of integrity, and it is a very rare example of this property type. It is one of three such devices in the world; the others are overseas at approximately equal intervals.

8.6.3 Property Type: Wind Tunnels

The NPS' *Man in Space National Historic Landmark Theme Study* resulted in NHL status for the Unitary Plan Wind Tunnel at the Ames Research Center, built on NACA land leased from NAS Moffett Field. (Moffett Field is the former NAS Moffett, a facility that was realigned through BRAC recommendations; it is now entirely a NASA facility and has no ties to the Navy.) It was one of several wind tunnels to be so designated as NHLs, although it is the only one in California (see Figure 39).

Examples:

- *Unitary Plan Wind Tunnel, NAS Moffett Field*—Designated an NHL.

Registration Requirements

There are probably many wind tunnels in California, although it does not appear that any such device on a military base has been determined eligible for the National Register. Furthermore, most of these wind tunnels are probably not associated with the Man in Space theme. It is likely that NASA conducted all of its California tests at the Moffett Field facility and that no further examples of this property type will be found to qualify for the National Register.

8.6.4 Property Type: Test Stands Used to Test Large Space Program Rockets

The stands used for testing ICBM and IRBM propellants were reused in many cases to test the large rockets for the space program. The Man in Space NHL theme study designated a number of test stands nationally, but none in California. The California test stands, particularly those at Edwards AFB, were used to test spacecraft motors, but NASA had to rely upon its own, highly specialized laboratories to test the firing of rocket motors in zero-gravity and other space conditions. In general, the test stands in California that have potential for significance as an example of this property type are the same stands used for testing ICBM and IRBM motors.

Examples:

- *Test stands of the Air Force Research Laboratory, Edwards AFB*—Thirty-five buildings associated with nine test areas have been found to qualify for listing in the National Register.

- *Jet Propulsion Laboratory, Edwards Test Site, Edwards AFB*—Inventoried and tentatively identified as a potential historic district.
- *Test stands at “Skytop,” NAWS China Lake*—Found not to qualify for listing in the National Register because they lack exceptional significance.

Registration Requirements

Propellant test stands take many shapes and have varying degrees of integrity. Some stands are horizontal, others vertical. Some include permanent buildings around the stands; others include a paved area or even open ground in which temporary stands may be erected. The tests at these stands are highly individualized, requiring a substantial re-working of the facility to handle different sizes and types of rocket motors.

The comprehensive studies at Edwards AFB and NAWS China Lake suggest that three factors need to be considered when evaluating the potential significance of test stands: age; directness of association with important tests; and integrity. The propellant testing program has continued without interruption since the early 1950s. The Air Force Research Laboratory at Edwards AFB was used to test the very large motors for the Atlas and Titan program during the 1950s. This work was highly significant, occurred relatively early in the Cold War, and required very permanent buildings to contain the huge motors. The work at China Lake, by contrast, was focused initially on small rocket motors for air-to-air missiles and did not require very large buildings at that time. The station ultimately built huge test stands for the Trident program, but this did not occur until the 1970s. Of the various test stands at China Lake, only the very recently built structure had a very high association with important tests as well as a high degree of integrity. A high threshold of exceptional significance related to their young age, however, resulted in a determination that the test stands did not qualify for the National Register at this time.

8.6.5 Property Type: Space Program Launch Sites

Vandenberg AFB emerged as one of the key launch facilities for the space program, rivaling Cape Canaveral. This role grew rather naturally from the base's involvement with IRBM and ICBM work. What is now called Space Launch 2, for example, was built in 1958 to test Thor, an IRBM. It was reused in 1959 to launch space satellites. NASA took over the launch area in 1962 to test Thor-based boosters for satellite launchers.

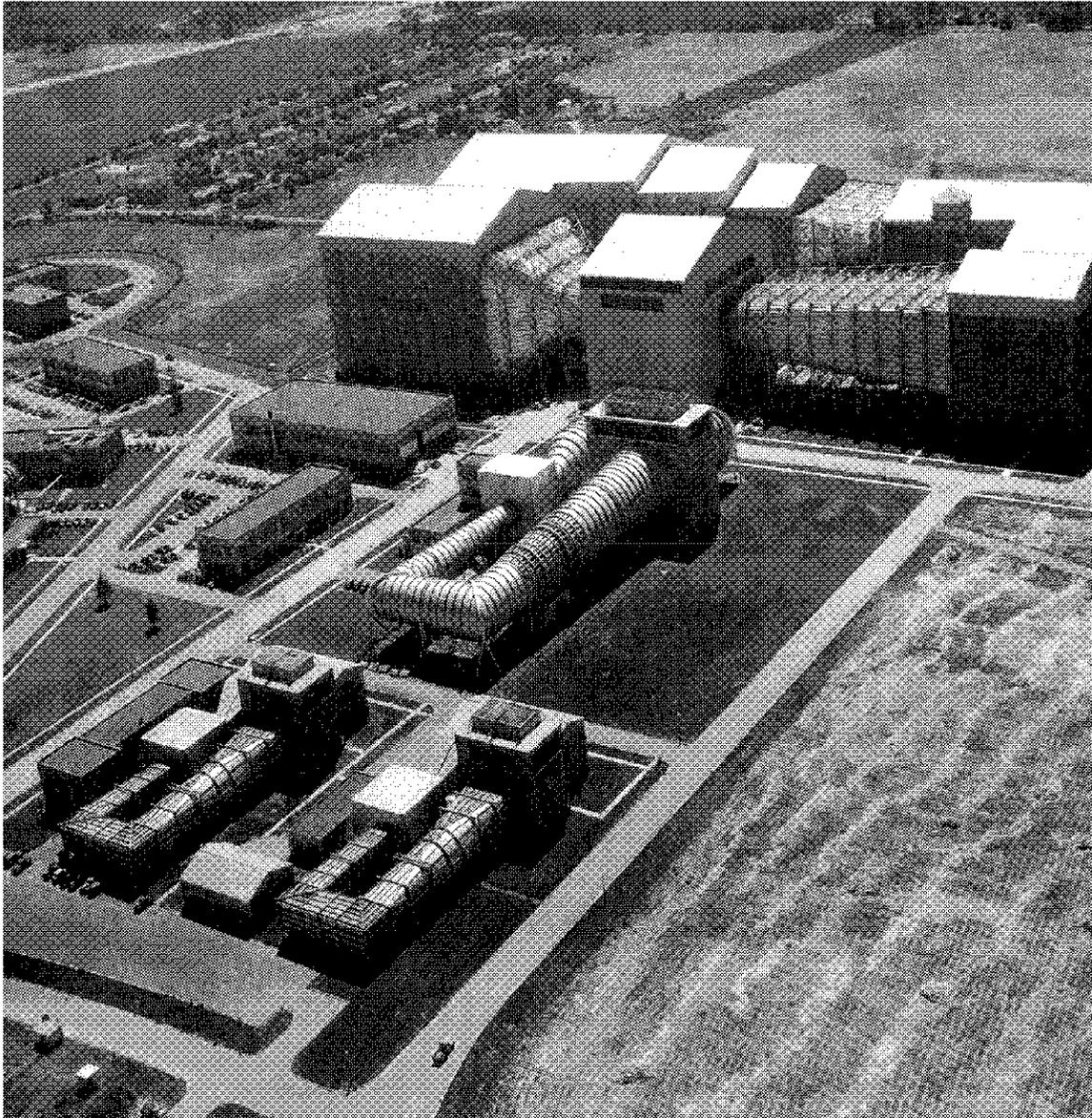


Figure 39. 1949 view of wind tunnels at Naval Air Station (NAS) Moffett Field. Although located on a Navy station, the facility was operated by the National Advisory Committee for Aeronautics (NACA) and later, its successor, NASA. (Source: the National Archives.)

Examples:

- *Space Launch Complexes 2, 3, 4, 5, and 10, as well as the General Electric Radio Tracking Station, Vandenberg AFB*—All found to qualify for the National Register; only Space Launch Complex 10 was designated as an NHL.

Registration Requirements

The Space Launch complexes at Vandenberg AFB appear to be the only such facilities in California. The other launch complexes listed as part of the *Man in Space National Historic Landmark Theme Study* are Cape Canaveral, the Kennedy Space Center, and a complex at the White Sands Missile Range. It is highly unlikely that any new facilities will be identified that might qualify for the National Register as examples of this property type. Therefore, no registration requirements are provided for this property type.

8.7 THEME 7: SUPPORT FOR TROOPS OVERSEAS

An emphasis on the high technology aspects of the military in California during the Cold War is warranted in that it captures the essential qualities that define “exceptional significance” during this period. This emphasis is misleading, however, in that it overlooks the “hot” wars of this era that claimed the lives of tens of thousands of Americans and dominated life at many California military bases during much of the post-World War II Era. Although troops were sent to dozens of locations during this period, the wars in Korea and Vietnam were by far the most important commitments of American military assets in the period after 1945.

The Korean War came so close on the heels on the end of World War II that the war was fought for the most part by reusing World War II-era facilities, including the many “temporary” training camps built up during the 1940s. American troops also fought the war for the most part with World War II surplus ordnance and machinery, although a few new weapon systems were available in the early 1950s. To a remarkable degree, there are almost no buildings or structures on California bases that were built during the Korean War. The explanation would seem to be that the limited defense budget of the time was dedicated to the war itself, rather than to the construction of new bases.

The absence of new buildings, however, does not suggest that the California military installations did not play a part in preparing troops for combat. Many of the World War II-era bases that had closed in 1945 were reopened to train troops bound for Korea. The World War II supply depots were very busy during these years, chiefly because most of the ordnance and supplies were sent by ship and plane from West Coast facilities.

The Vietnam War was America's most protracted conflict, although the number of troops involved at any one time was small by comparison with troop strength during World Wars I and II. The Vietnam War had at least two characteristics in common with the Korean War with respect to impacts on California bases: it was limited in scope; and it was a Pacific Ocean war that was supplied chiefly from California and other West Coast states.

It appears that no property has been found to qualify for listing in the National Register, strictly on the basis of its association with the Vietnam War. The most convincing explanation for this fact is that the Vietnam-era properties are quite young, requiring a demonstration of a higher degree of exceptionality than would be required for early Cold War properties.⁹¹ In a sense, there are many National Register-eligible properties that are associated with the Vietnam conflict. The major laboratories, for example, were dedicated to conducting research to support pilots, ground troops, and Navy personnel in this war. The Michelson Laboratory at China Lake, for example, had a dedicated Vietnam-research program, as did Building A33, the major laboratory building at what was then called NEL, now the SSC San Diego. The repair hangars at McClellan AFB, listed in the National Register, were as busy during the Vietnam years as in any period except World War II. These properties, however, are generally listed or found to qualify for the National Register for other reasons, even though they played important "leading-edge" roles during the Vietnam conflict.

It may be anticipated that at some point in the future, our perspective will shift with respect to the Vietnam War-era properties, particularly as these properties begin to approach the 50-year threshold.

8.7.1 Property Type: Training Base for Korean War

One of the few new installations to be opened during the Korean War was the Marine Corps Mountain Warfare Training Center (MCMWTC), Bridgeport, in the Sierra Nevada, designed to train Marines in the cold and mountainous conditions they would likely face in Korea. The facility remained open after the Korean War to deal with the possibility of conflict during the cold winters in the Soviet Union or other Eastern Bloc countries.

⁹¹ National Park Service, National Register, Bulletin 22, "Guidelines for Evaluating and Nominating Properties that Have Achieved Significance within the Last Fifty Years," n.d. and the earlier 1979 bulletin of the same name make the distinction between properties that are nearly 50 years old and those that have achieved significance in very recent years.

Examples:

- *MCMWTC Bridgeport*—Inventoried and evaluated; no properties found to qualify for listing in the National Register.

Registration Requirements

Although it has been nearly 50 years since the end of the Korean War, it appears that no properties in California have been listed in or determined eligible for listing in the National Register on the basis of their association with that conflict. There are several explanations for this fact. The most compelling is that the war came so shortly after World War II that the vast infrastructure from the earlier war was put into service for the Korean conflict. Stated differently, the military had little need to construct new buildings or structures for the Korean War, given the vast surplus of properties left over from World War II. In addition, the Korean War involved a much smaller commitment of personnel and supplies than was the case with World War II, and it was shorter in duration. Another explanation is that the Korean conflict was fought at a time in which the Federal government was seeking to reduce its overall expenditures on defense. The war effort captured a very large share of funding that might have been available for construction of statewide military bases.

The fact that no properties have been identified to date should not, however, be taken as an indication that no Korean War-related properties will be identified in the future. Like all Cold War-related properties, these should be evaluated using the three overarching considerations of strength of association, rarity, and integrity. The Marine Corps facility in Bridgeport, for example, appears to be directly associated with the peculiar aspects of that war and is a rare example of a facility established directly for the war effort. It fails to qualify for the National Register, however, chiefly because it lacks integrity; although it was established during the Korean conflict, most of the existing buildings were constructed during the 1980s.

8.7.2 Property Type: Supply Depots for Support of Korean and Vietnam Wars

The fact that the Korean War broke out only a few years after the end of World War II was propitious in many ways. Much of the infrastructure that supported American troops in the Pacific Theater during World War II could be readily reused for the Korean War as well. All of the major supply and ammunition depots in California were put back into a wartime level of operation during the Korean War. It does not appear, however, that a substantial number of new buildings were constructed during that time period.

The World War II-era supply and ammunition depots that supported the Korean War effort were pressed into duty during the Vietnam War as well. It appears that there was more new

construction during the Vietnam Era than the Korean Era . To a large degree, however, the World War II-era warehouses of the supply depots and the igloo magazines of the ammunition depots were reused for the Vietnam conflict as well.

Examples:

- No buildings or structures at supply and ammunition depots have been found to qualify for the National Register on the basis of their association with the Korean or Vietnam Wars.

Registration Requirements

There are numerous supply and ammunition depots in California. Collectively, these depots represent a storage capacity that far exceeds what is needed in peacetime. Only in time of war have these facilities been used to their capacity. The buildings are relatively intact, at least in part because they have been used heavily only in time of war.

It appears that all of the supply and ammunition depots in California have been inventoried and evaluated, and that none has been found to qualify for the National Register on the basis of their associations with the Korean or the Vietnam wars. Many of the buildings, however, have been found to qualify for listing in the National Register on the basis of their contribution to the American war effort during World War II.

The eligibility of these properties for their World War II associations, coupled with their ineligibility for Korean and Vietnam War associations, may be explained by several factors. First, the events related to the Korean and Vietnam wars occurred less than 50 years ago, dictating a proof of “exceptional significance” to justify National Register eligibility. Second, it can be argued that most of the supply and ammunition depots in California were more directly associated with the World War II effort than with Korea and Vietnam. The depots were built specifically to support the World War II effort; the major supply and ammunition depots were constructed during the 1939-1945 era. Further, the pace and scale of activity was far greater during World War II than during either of the later conflicts. To be certain, these depots were busy during both the Korean and Vietnam conflicts but never to the extent of the World War II effort. Finally, in most cases, the Cold War-era buildings at the supply and ammunition depots are scattered throughout the bases, without the cohesive design elements that unite the World War II facilities. In all cases, depot buildings have been found to qualify for the National Register as parts of historic district, not as individual buildings. Cold War significance for the supply depots in California should be based upon exceptional significance within the context of

this function; ordinary supply and dispersal functions will generally not suffice as a basis for National Register eligibility.

8.7.3 Property Type: Specialized Laboratory Support for Vietnam War

One Vietnam-specific program was the Navy's Vietnam Laboratory Assistance Program (VLAP). Under this program, the several high-technology laboratories in California, especially NAWS China Lake, NEL, and the Naval Undersea Center (NUC), dedicated some portion of their assets to work on specific projects that would be useful to American troops in Vietnam. The laboratories sent resident engineers to Vietnam who would report back to the states with specific problems that might be solved through R&D and T&E. NEL, for example, developed light filters for Navy radar units to avoid detection at night. The oceanographers at NUC developed survival techniques for underwater mine demolition crews who had been attacked by exotic sea life in the area. The laboratory at China Lake developed numerous weapons for use in Vietnam, including fuel-air explosives for clearing landmines at helicopter landing sites.⁹²

It is likely that the Air Force and Army had similar programs to support the special needs of the Vietnam troops, although no evidence of such involvement has been located.

Examples:

- No property has been found to qualify for the National Register on this basis alone. Some properties, such as the Michelson Laboratory at NAWS China Lake and Building A33 (NEL) at the SSC San Diego, have been found to qualify for the National Register, but for pre-Vietnam War developments.

Registration Requirements

This is a largely untapped area of research. Available evidence suggests that the Vietnam-related research was highly focused and designed to solve very specific problems. The China Lake research, for example, was geared to accept problems that could be solved in three to six months and for which large-scale production was not anticipated.⁹³ Given its short-term orientation, it is unlikely that this program resulted in the invention or perfection of fundamentally new technologies. This does not, however, mean that the solutions were not significant to the troops.

⁹² This VLAP program is detailed in: Naval Ocean Systems Center, "Fifty Years of Research and Development on Point Loma, 1940-1990," and in Naval Weapons Center, "Activity Summary: Vietnam Laboratory Assistance Program (VLAP)," 1982.

⁹³ Naval Weapons Center, "Activity Summary: Vietnam Laboratory Assistance Program (VLAP)," 1982.

This is an area that deserves attention, particularly as the Vietnam War-era buildings and structures begin to approach the 50-year threshold.

8.8 THEME 8: TOTAL ARMY AND NAVY; COORDINATION OF REGULAR FORCES, RESERVE, NATIONAL GUARD

All branches—Army, Navy, Air Force, and Marine Corps—have relied upon some type of a reserve system since the early years of the 20th century. The reserves became increasingly important to all branches of the military during the post-World War II Era. America was unwilling to maintain a World War II level of regular troop strength, but nonetheless was faced with an unrelenting state of hostilities throughout the latter half of the 20th century. The most economical and least disruptive way of maintaining a state of readiness in the absence of an “all out” conflict was to rely upon a substantial reserve system that could be called upon as needed. The “total force” concept brought the reserve and National Guard units closer and closer into the operations of the regular forces.

8.6.1 Property Type: Naval Reserve Centers or Naval and Marine Corps Reserve Centers

Although there has been some type of Naval and Marine Corps Reserve system since the end of the Civil War, there were no separate reserve training facilities anywhere in the United States until the mid-1930s. It was not until the Cold War that the Naval and Marine Corps Reserve units were treated as true backups to the regular Navy, and were funded and staffed accordingly.⁹⁴ Thus, the vast majority of existing Naval and Marine Corps reserve centers that exist in California today were built during the Cold War.

The reserve centers from the 1930s, which were often funded as job creation projects, were built to high standards in terms of the quality of construction and design. Examples include the Los Angeles and Santa Barbara centers. The Los Angeles Center, for example, was designed by Stiles O. Clements and is an excellent example of his work, combining classical and Art Deco elements. The Santa Barbara Center is a Spanish Colonial Revival building; a fact likely dictated by pressure from local officials to maintain the general program of the downtown area. The earliest Cold War reserve centers were temporary, built around surplus Quonset huts or Butler buildings, for example. More recent reserve centers have been built to permanent standards.

⁹⁴ Hardy-Heck-Moore, “Cultural Resources Survey and Assessment of Naval Reserve Centers in Southwest Division, Engineering Field Activity West, Engineering Field Activity Northwest, Pacific Division, Atlantic Division, Naval Facilities Engineering Command,” 1998, give a background on the development of the Navy Reserves and, to a lesser degree, Marine Corps Reserves. It appears that neither the Army nor the Air Force has undertaken a similar type of contextual study for reserve centers.

Examples:

- *Naval and Marine Corps Reserve Center, Los Angeles*—A 1930s building. Determined eligible for listing in the National Register. It has been or soon will be transferred out of DoD control.
- *Naval Reserve Center, Santa Barbara*—A 1930s building. Determined eligible for listing in the National Register. It is now privately owned.
- *Naval Reserve Center or Naval and Marine Corps Reserve Centers in Bakersfield, Fresno, San Bruno, San Jose, Pomona, and Alameda*—All Cold War-era buildings. Determined not to be eligible for listing in the National Register.

Registration Requirements

The Cold War-era reserve centers are less than 50 years old and must be shown to be exceptionally significant. In most instances, it would be difficult to make that case, given the routine and secondary role of the reserves in the larger program of the Navy. The reserve centers are more likely to qualify architecturally than historically, and the 1930s centers are more likely to qualify than are the Cold War centers.

8.8.2 Property Type: Army Reserve Centers

Army Reserve centers are often confused with National Guard centers, with which they are allied closely. The National Guard, Army Reserve, and regular Army facilities are sometimes difficult to separate. Fort Hunter Liggett, for example, is still owned by the Army but is used almost exclusively by Army Reserves and the National Guard. Camp Roberts and Camp San Luis Obispo are also used cooperatively by Guard and Reserve units. Fort Irwin, a regular Army training center, also hosts National Guard and Army Reserve activities.

Examples:

- *Rio Vista Army Reserve Center*—Determined not to be eligible for listing in the National Register.
- *Building 2605 at March AFB, now used by the Reserves*—It was found to qualify for the National Register for its association with the Air Force activities, prior to realignment.
- *Los Alamitos Reserve Center, created from a World War II-era NAS*—Parts have been inventoried and found not to qualify for listing in the National Register.

Registration Requirements

It is likely the bulk of Army Reserve facilities have not been inventoried and evaluated. These reserve facilities, indeed, appear to be a largely untapped area of the military presence in

California. The Navy has conducted a nationwide inventory of Navy Reserve centers, clarifying the status of reserve properties in California.⁹⁵

The Navy study suggests that Reserve properties will fall into one of four categories. First, there are individual buildings or groups of buildings that were designed specifically to serve that purpose, i.e. they have always been reserve centers. It is likely that most of these were built during the Cold War Era (or even more recently), although some may be older. Second, there are likely buildings that are used today by the Reserves that were built for some other purpose. The likely candidates in this regard are older military bases (most likely World War II bases) that were surplused by the original branch, but retained by the Reserves. Third, in a manner that is unique to the Army, there are reserve-related properties that may be owned and administered in cooperation with the regular Army and the California National Guard. Finally, there are many state-owned properties used by the National Guard, that may also be used by the Reserves.

Because there has been so little inventory work to date, it is difficult to establish rigorous registration requirements for this type of property. In actual practice, it is likely that each category of Reserve properties will need to be evaluated in its own context, or perhaps in dual contexts. The Reserves, for example, probably control a number of old World War II-era buildings. These buildings might be important for their World War II uses (in the context of the original branch), and they could conceivably be important within the context of reuse by the Reserves.

Throughout the Cold War studies, however, the distinction has been made between “routine” and “leading-edge” activities of the military.⁹⁶ Reserve activities appear to epitomize the “routine” aspects of the larger military presence in California. While they are obviously important to the larger force structure, the Reserve units are typically assigned duties that do not fall into the “leading-edge” category. This generalization, however, may have exceptions. The absence of comprehensive inventory effort in this area leaves a large data gap in how these types of properties should be treated.

The most efficient and effective way of treating the various Army Reserve properties is to adopt the comprehensive approach taken by the Navy. It may not be necessary to inventory these

⁹⁵ Hardy-Heck-Moore, “Cultural Resources Survey and Assessment of Naval Reserve Centers in Southwest Division, Engineering Field Activity West, Engineering Field Activity Northwest, Pacific Division, Atlantic Division, Naval Facilities Engineering Command,” 1998.

⁹⁶ This distinction is made in Center for Air Force History, “Coming in from the Cold: Military Heritage in the Cold War: Report of the Department of Defense Legacy Cold War Project,” Washington, DC: 1994, and has guided Cold War studies for nearly a decade.

properties on a nationwide basis; a California statewide inventory would probably reveal the complexity and range of property types that might be encountered nationally. In the absence of this type of an inventory, it will be necessary to approach these facilities one by one, leaving open the possibility for inconsistency in treatment, a common problem with this general approach.

8.8.3 Property Type: Air Force Reserve Centers

Air Force Reserve centers are located at various sites, from active Air Force bases to facilities shared with the California Air National Guard and other reserve or guard units. The general pattern of development for Air Force Reserve centers probably parallels that for the Navy and Army, except that there are probably fewer of them and none is older than 1947, when the Air Force was created from the AAF.

Examples:

- There is no indication that any Air Force Reserve center has been inventoried, evaluated or found to qualify for listing in the National Register.

Registration Requirements

It is likely that all of the Air Force Reserve have been inventoried and evaluated. All general comments regarding Army reserve centers apply to the Air Force Reserve as well.

8.9 THEME 9: MILITARY THE ARCHITECTURE OF THE COLD WAR ERA

The Cold War produced two diametrically opposed patterns with respect to the design and construction of buildings: a heavy reliance upon essentially temporary buildings for most purposes; and construction of some of the most permanent buildings and structures ever devised. One suspects that the World War II experience affected the first trend. After all, the United States had won the greatest war in the history of the world, operating in most instances from flimsy wooden barracks and other temporary buildings. The war effort had shown that the military could function from temporary or semi-permanent buildings and still be effective. The war demonstrated that for most purposes there was no need for the highly permanent and handsome buildings the military had always built. In some respects, permanent buildings got in the way of the military effort, particularly in areas in which technology was changing rapidly. The pre-war supply depots, for example, had been built in reinforced concrete to support piece handling of cargo. When the military developed new palletization methods for handling cargo, the old warehouses were outmoded and could not be modified, owing to their permanent construction. The permanent warehouses were nearly useless by the end of the war.

Whatever the effects of the war experience may have been, the fact was that the military after World War II showed a decided preference for inexpensive, semi-permanent, and “off-the-shelf” type buildings for most purposes. One of the most common building types from the 1950s is the “Butler Building,” a prefabricated metal shed that had its origin in World War II design. In later Cold War decades, the military continued to buy buildings that are not truly prefabricated but which can be built to nearly any configuration. “Pre-engineered” is the modern term for the direct descendants of the older Butler buildings, which were in turn similar in many respects to wartime Quonset huts. Pre-engineered shops and sheds may be found on nearly any type of base and used for almost any purpose, from testing rocket propellant to storing gasoline.

At the other extreme, the military during the Cold War built some of the most permanent structures imaginable. These may be seen as falling into two categories: industrial and administrative. The term industrial is used broadly to apply to a wide range of resources, from rocket launchers to manufacturing facilities. Administrative is also used broadly to apply to office buildings, laboratories, and other buildings of the sort.

The two types of buildings, industrial and administrative, were constructed to very high standards but for very different reasons. A structure like a Titan II silo was built to incredibly high standards because there was no choice; the pressure from launching a giant 15-story rocket demanded nothing less. Buildings such as laboratories were constructed to very high standards because they were being built for long-term use, in the same way that, say, a university classroom or a county courthouse would be built to permanent standards, recognizing that it would be needed for many years.

8.9.1 Property Type: Prefabricated or Pre-Engineered Shops

As noted earlier, the military has purchased thousands of prefabricated or pre-engineered metal shops buildings throughout the Cold War Era. These buildings are the functional equivalent of the World War II prefabricated structure, such as the Quonset Hut, the Stran Steel shed, and other such buildings. During the late 1940s and 1950s, a very high proportion of these buildings was manufactured by the Butler Manufacturing Company, to an extent that the term “Butler building” came to have a generic as well as a specific, trademarked meaning. More recently, numerous companies have specialized in these industrial buildings, which are used in great numbers by private industry and the military.

The prefabricated or pre-engineered shops or sheds are used for many purposes, including routine storage, storage for highly sensitive projects, laboratory functions, and manufacturing for a host of other purposes.

Despite their humble appearance, these pre-engineered sheds were often assigned very important functions. Karen Weitze comments on the “generic character” of some of the more important Cold War properties, referring specifically to the properties of the Air Force Air Mobility Command (AMC):

A final challenge in the inventory and evaluation of the facilities of the AMC installations is their highly generic character. A peculiar and inescapable problem of Cold War interpretation is the cavernous gap between created, and thus anticipated, images of a fantastic, scientific destruction of the world, widely disseminated in Western popular culture for more than a century through fictional stories, plays, books and movies, and the realities of simple buildings or structures either constructed to be temporary (prefabricated steel shed and trailers), or short lived (above and below ground concrete bunkers hardened for a first defense and retaliatory attack)... Yet even at the end of the Cold War, one of the more spectacularly conceived systems of nuclear defense, Rail Garrison, was predominantly low-key in appearance, with the continued use of prefabricated metal sheds and simple bunkers. We anticipate something more than what is physically to be found.⁹⁷

Examples:

- *Buildings at the AFSWP Area Q, Travis AFB*—Found to meet the criteria for listing in the National Register, some of which are concrete block or pre-engineered metal buildings.
- *Buildings at the Rail Garrison Historic District, Vandenberg AFB*—Found to meet the criteria for listing in the National Register, some of which are pre-engineered metal sheds.

Registration Requirements

The pre-engineered shops buildings should be evaluated in much the same manner as Quonset Huts and other prefabricated buildings from World War II, with the proviso that, due to their recent construction and young age, these Cold War buildings must also be shown to be exceptionally significant. It is extremely unlikely that any such building will be found to qualify on the basis of its architecture or engineering. The only possibility for eligibility for such buildings in under National Register Criterion A, for association with events, or under Criterion C, as a part of a complex of buildings and structures that is significant for its engineering, apart from the pre-engineered shop. This is the case, for example, with the Rail Garrison Historic District at Vandenberg AFB, which is significant for the totality of its engineering, but not specifically for the engineering of these support buildings.

⁹⁷ Karen J. Weitze, “Travis Air Force Base, Fairfield, California. Inventory of Cold War Properties,” October 1996, 18.

8.9.2 Property Type: Permanent Industrial Facilities

The permanent operational buildings from the Cold War were built to accomplish missions that were inconceivable in earlier decades. The reasons for this heavy construction differed from one property to the next. The SAGE buildings, for example, were heavily reinforced to make them capable of withstanding near-miss nuclear explosions. The Titan II missile sites were so built to withstand the force of the missile launch. Building 55 at NAWS Point Mugu was built to launch much smaller missiles from its roof; it required a roof design capable of withstanding the weight of the missiles as well as their blasts. The ICBM propellant test stands at Edwards AFB were designed to withstand the pressure of captive tests of these very large missile motors.

Examples:

- *Titan II launch facility, Vandenberg AFB*—Determined eligible for the National Register.
- *Propellant stands at the Air Force Research Laboratory, Edwards AFB*—Determined eligible for listing in the National Register.
- *Building 55, the launch building at NAWS Point Mugu*—Determined eligible for listing in the National Register.
- *SAGE buildings, Norton AFB and Beale AFB*—Inventoried and found not to qualify for the National Register.

Registration Requirements

The military needed good reasons to build something as permanent as the Titan II silos or the SAGE buildings. Heavy construction often correlates with importance of mission. For this reason, the heavily constructed Cold War buildings are likely to qualify for the National Register under Criterion A, for their security function, as well as the intrinsic value of their design. Nonetheless, the engineering for buildings of this sort was noteworthy and deserves consideration, above and beyond the functional aspects.

The large, permanent industrial facilities from the Cold War may also be seen as interesting from the design standpoint, as exemplary expressions of Louis Sullivan's dictum regarding form following function. Whatever beauty these buildings and structures possess, however, likely came about by accident, with great sculptural forms emerging from the requirements of the facility. Nonetheless, to most observers, the concrete and steel forms of many of these structures—the huge propellant test stands at Edwards AFB, the propellant press buildings at NAWS China Lake, the Titan silos at Vandenberg AFB, and others—possess an intrinsic interest if not beauty, expressing honestly the power and exotic nature of the operations contained

therein. When considered under Criterion C, however, the issue of integrity becomes especially important.

8.9.3 Property Type: Permanent Administrative Buildings

In addition to operational facilities, the military built very permanent buildings for its laboratories and a few other functions. As noted, these buildings were built to very high standards, not because of what occurred there, but because the use was seen as long-term. Granted, the laboratory uses were likely identified as potentially dangerous and included industrial functions as well, such as metalworking. Most of these functions, however, could have been handled in Butler buildings or other semi-permanent structures. The most plausible explanation for the permanent design of the major laboratories was the sense that the buildings would be used for many years, justifying highly expensive construction methods and greater attention to details of the design.

The major examples of this property type, the Michelson Laboratory at NAWS China Lake and Building A33 at the SSC, are significant chiefly under Criterion A, for what was accomplished there. In both cases, however, the buildings were found to meet Criterion C, for their design as well. In the case of these two buildings, architectural significance was treated in a functional as well as an architectonic sense. Functionally, the buildings were ingeniously built to accommodate anticipated changes in laboratory methods. Internal walls were designed to be movable, as were the major industrial sites, such as the foundries, optical laboratories, or metal working shops.

The architectonics, the strictly aesthetic elements of design, are more difficult to interpret. The various “modern” styles from the 1920s through the 1960s, from Art Deco through the Streamline Moderne through the International Style, share two obvious characteristics: an abandonment of any interest in reviving historical period architecture, and a concern with an honest and straightforward expression of the structural properties of newer materials, such as steel and concrete. A case could be made as well that these styles are united by the sense of movement, from the curvilinear lines of Art Deco through the angularity of the International Style lines. At their best, these buildings speak to what was modern about the decade in which they were built.

The Michelson Laboratory was designed during World War II but not completed until 1948. This laboratory was highly unusual in that it was a permanent building conceived during the war years, in which very few permanent buildings were designed or built. It represents a good expression in a Federal project of the architectural trends of that time. The Navy’s BuDocks designed Building A33 at SSC San Diego in 1949; the building was completed in 1950 and 1951.

It is so similar to the Michelson Laboratory that it almost certainly was patterned after the laboratory at NAWS China Lake. To the extent that Building A33 differs from the Michelson Laboratory, it does so by being even more frankly modern and angular. The central entrance to Building A33, for example, is a more formal International Style expression than any one element in the Michelson Laboratory (see Figure 40). Even if there was no intent to imitate the Michelson Laboratory, the effect was the same. Both are massive buildings that reflect an early, at least for the Federal government, example of International Style design.

Whether intentionally or not, the Navy architects for these buildings captured the feel of the time and place. The thoroughly modern buildings were symbolically appropriate for high technology facilities in a military branch on the verge of its most dramatic technological advances. While most Americans in 1951 were probably unaware that the nation was developing the basic tools that would lead to computers, satellites, space vehicles, and other characteristic elements of high technology in the late 20th century, the scientists who worked at the Navy laboratories were working daily with such technologies. The sleek modernity of Building A33 and Michelson Laboratory captures the mood of the times and of that place in particular. Whether or not the buildings represent exceptionally good architecture, they are highly appropriate and fitting designs for the Navy laboratory that they housed.

Examples:

- *Building A33, SSC San Diego*—Appears to meet the criteria for listing in the National Register.
- *Michelson Laboratory, NAWS China Lake*—Determined eligible for listing in the National Register.

Registration Requirements

The modern architecture of military buildings, like modern architecture generally, is difficult to appreciate in context, because it is a relatively new phenomenon. Nonetheless, the better examples of this style on military bases rank with the better examples of civilian design.

Caution should be exercised, however, in evaluating modern architecture as it has been expressed in military design. The two examples that have been found to qualify in this regard, the Michelson Laboratory and Building A33, have two advantages that will rarely be duplicated: both are highly significant under Criterion A and they are 50 years old or nearly 50 years old (the Michelson Laboratory was completed in 1948, Building A33 is 1950-51). The buildings qualify for the National Register primarily on the basis of the scientific work that was accomplished there; architectural significance is secondary.



Figure 40. Entry pavilion at Building A33, Space and Naval Warfare System Center (SSC), San Diego. Built in 1951. The best of the Cold War buildings on military bases capture the essence of modern architecture. (Source: JRP Historical Consulting Services.)

In both cases, however, architectural merit is important to the extent that it reinforces the function there. These two laboratories were literally and figuratively “space age” in their orientation—forward-looking and at the technological cutting edge. The unabashedly modern design was important, not for its intrinsic merit, but for the degree to which it expressed the orientation of the work inside. No style but the modern could have expressed this function so well. It was modern architecture for the most thoroughly modern work of the military in California. The design, in short, was appropriate for these buildings.

