



Built on Strong Foundations: Constructing Our Nation's Military Heritage

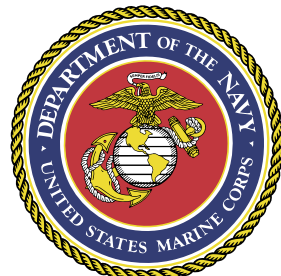


It is the policy of the Federal Government to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government, and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties. The Federal Government shall recognize and manage the historic properties in its ownership as assets that can support department and agency missions while contributing to the vitality and well being of the Nation's communities and fostering a broader appreciation for the development of the United States and its underlying values.

Section 1, Executive Order 13287



A product of the Department of Defense's Legacy Resource Management Program.



**Built on Strong Foundations:
Constructing Our Nation's Military Heritage**

The United States Department of Defense (DoD) is pleased to present this publication summarizing the *National Historic Context for Department of Defense Installations*. The four-volume technical report was completed in 1995 as a demonstration project under the federal Legacy Resource Management Program. It examined the historical and architectural evolution of construction on military installations in the contiguous United States from 1790 to 1940. The *National Historic Context* is a planning document that has supported DoD in its stewardship responsibilities for our nation's heritage resources on military installations.

The central mission of the U.S. military forces is the defense of the United States – its people, its land, and its heritage. The preservation of historic places under military stewardship has been a long-standing priority within the DoD primary mission. DoD manages a range of unique resources associated with the historical development of the U.S. military, as well as other aspects of North American history and prehistory. These cultural resources are tangible reminders and symbols of our national heritage.

This brochure is designed as a popular historical overview illustrating the patterns and events that have shaped American military construction. This construction history is represented by a diverse collection of historically significant buildings, structures, objects, and landscapes.



Built On Strong Foundations is organized chronologically into major periods of nationwide military construction from the American Revolution to the end of the Cold War. Each section includes both an essay on military construction activity and a timeline highlighting important national and international events. Information on historic properties illustrating each period of construction are depicted in "roadside markers" scattered throughout this brochure.



National Register of Historic Places

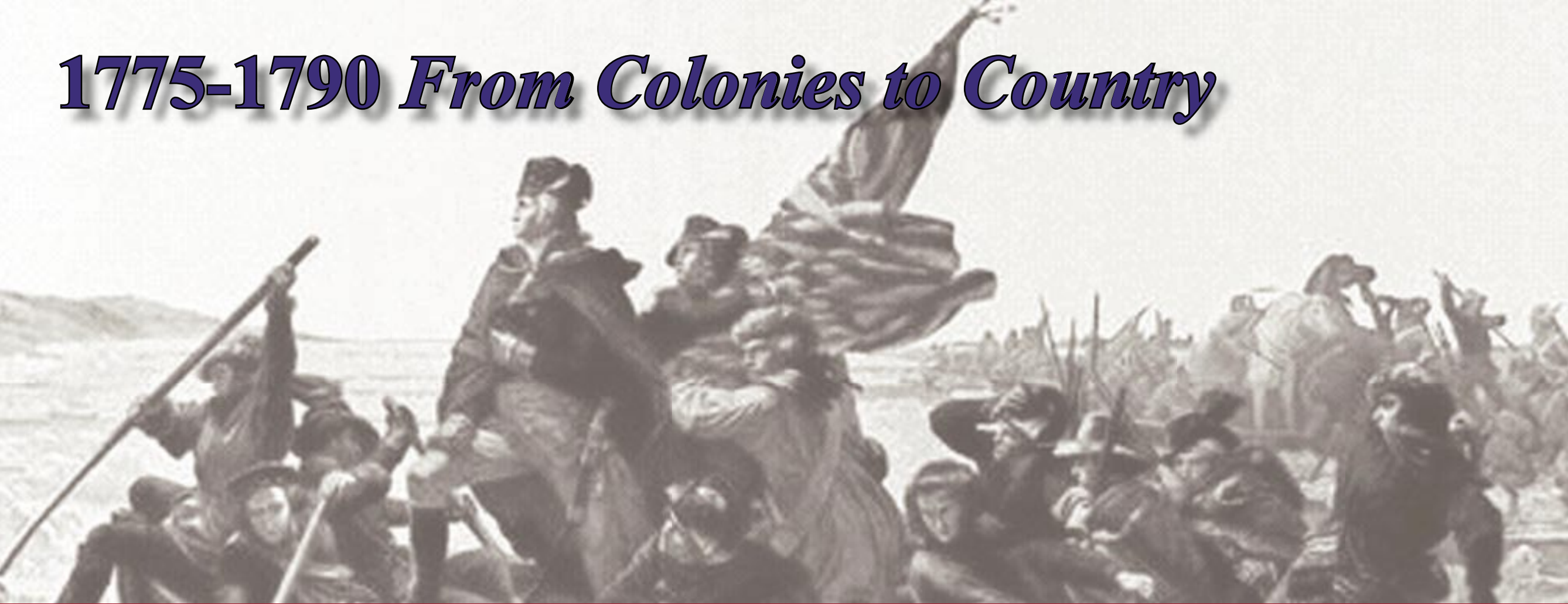
Reflecting our country's rich military heritage, many historic properties owned by the Department of Defense are listed on the National Register of Historic Places. The National Register is the nation's official list of buildings, districts, structures, objects, and sites that are significant in our country's past. The National Register is administered by the National Park Service, a branch of the Department of the Interior.

National Historic Landmarks

Some Department of Defense properties are designated National Historic Landmarks. The Secretary of the Interior grants this designation to historic places that are exceptionally valuable because of their national historical significance.



1775-1790 *From Colonies to Country*



The modern American military traces its roots to the American Revolution (1775 – 1783). Today’s Army, Navy, and Marines originated in the fight for independence between the thirteen original colonies and Great Britain. The thirteen colonies faced a formidable opponent in Great Britain, which possessed a well-trained and well-equipped world-class army and navy. In contrast, the colonies historically relied on local militias for defense. The Revolutionary War began on April 19, 1775, with the battles of Lexington and Concord, Massachusetts. A regional army soon was organized in Boston to fight the British in New England.

The second Continental Congress, which convened in May 1775, was reluctant to authorize a standing army drawn from all thirteen colonies. This position reflected the views held by many colonists prior to the Declaration of Independence in 1776. The Continental Congress initially hoped to reconcile colonial differences with Great Britain. In addition, a major complaint in the colonies was the presence of the British army, which was charged with enforcing English law, and which limited colonial liberties.

The escalating conflict prompted Congress to take action. On June 14, 1775, Congress authorized the creation of a Continental Army, and the following day, George Washington was appointed unanimously as its commander. That same year, Congress created the Continental Navy and Marines. The Navy was established on October 13, when the Continental Congress commissioned two vessels to undertake a three-month tour of duty intercepting British supply ships. Each colonial vessel was armed with ten carriage and swivel guns and manned by 80 crewmen. On November 10, 1775, Congress adopted a resolution to raise two battalions of Marines. The U.S. Navy and the U.S. Marine Corps observe these dates in the fall of 1775 as their official birthdays.

A Chief Engineer for the Continental Army was appointed to design and build forts and other defensive structures. The Quartermaster Department was established to distribute supplies. Fortifications were built at strategic locations in the colonies and on the frontier. Soldiers and sailors lived and fought under rustic conditions. During campaigns, soldiers were housed in log huts or tents, while sailors and Marines lived aboard ships.



1775-1790

- 1767 British merchant builds Gosport Shipyard in Portsmouth, Va., renamed Norfolk Naval Shipyard in 1862
- 1774 Continental Congress meets for the first time
- 1775 Revolutionary War begins April 19
- 1775 Continental Army authorized June 14, George Washington appointed commander in chief June 15, posts of Chief Engineer, Quartermaster General created June 16
- 1775 Continental Navy established Oct. 13
- 1775 Congress authorizes two battalions of Marines Nov. 10
- 1776 Declaration of Independence signed in Philadelphia
- 1777 Carlisle Barracks, Pa. established
- 1778 Washington establishes garrison at West Point, N.Y. to defend Hudson River
- 1779 Army Corps of Engineers formed
- 1783 Revolutionary War ends with Treaty of Paris
- 1784 Congress discharges Army June 2, establishes peacetime Army of 700 men June 3. Navy and Marines disbanded and ships sold
- 1789 U.S. Constitution goes into effect on March 4, following a Constitutional convention and ratification by nine states
- 1789 George Washington inaugurated as first U.S. President on April 30 in New York City

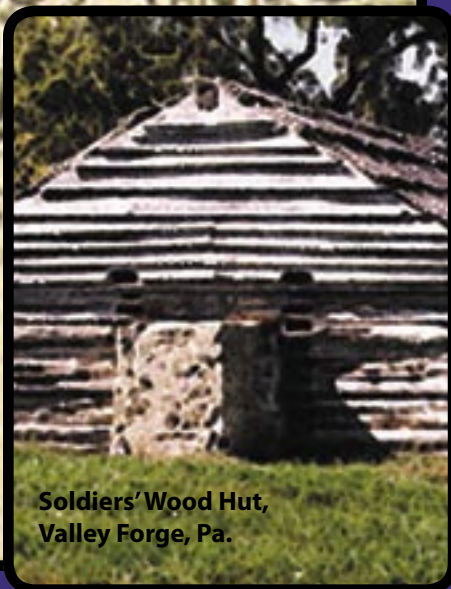
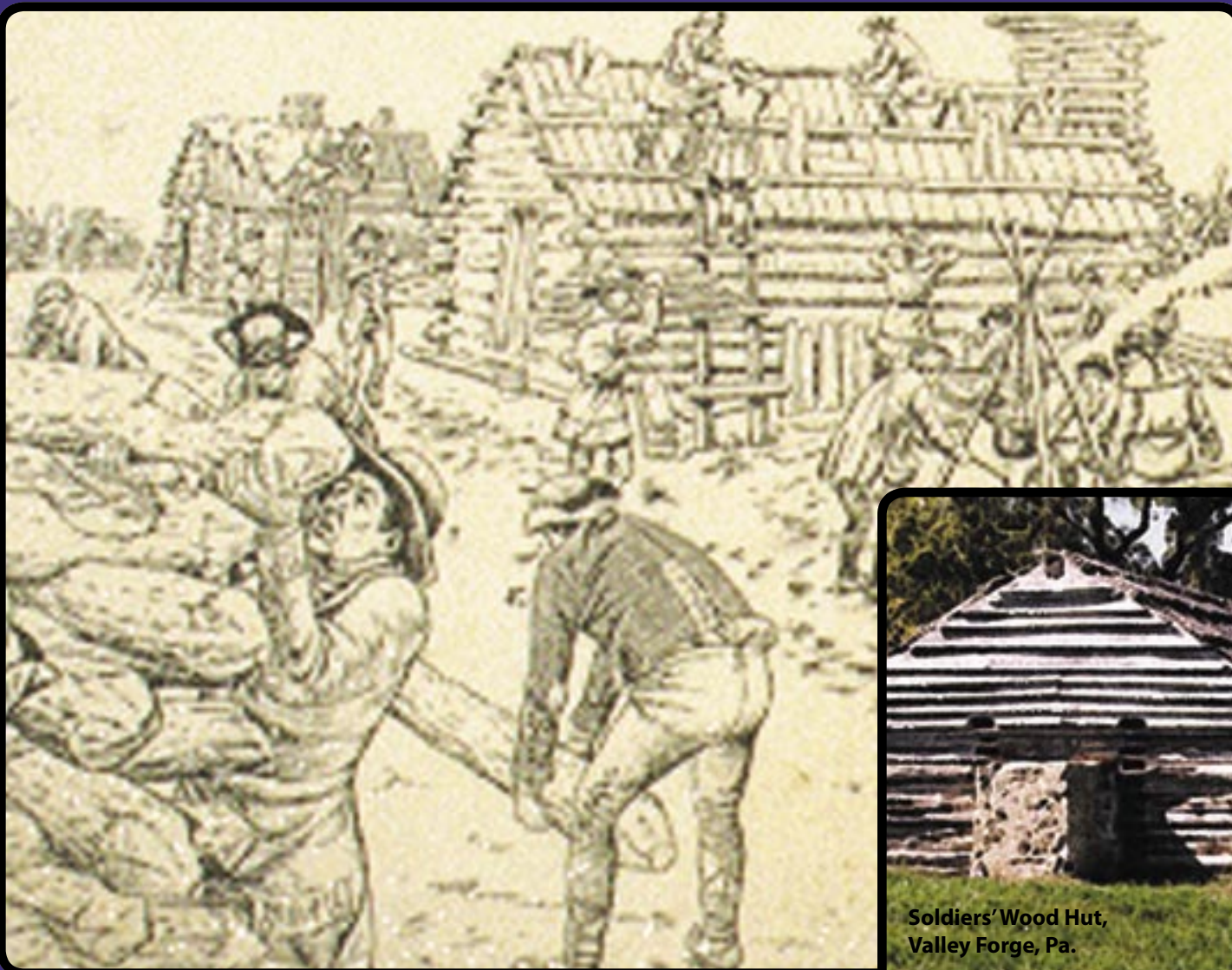


Military Construction

Forts and batteries were constructed along rivers, on high ground, and along the western frontier to provide the Continental Army with a strategic advantage against the British, to quarter soldiers, and to protect area residents. During military campaigns, space within defensive structures was limited, and usually it was not possible for hundreds of soldiers to be quartered within the forts. During the winter, soldiers lived in temporary military camps of log huts. Among the most famous of these camps is Valley Forge, Pennsylvania, near Philadelphia. This encampment was occupied by General George Washington and the Continental Army during the winter of 1777-1778. Each one-room wooden hut included a wood fireplace. Spaces between the logs or wood slabs were sealed with clay. Each hut housed 12 soldiers. Examples of this early military housing are preserved at historic forts and encampments.

On its march, the Continental Army lived in cloth tents issued by the Quartermaster Department, which bought them from private manufacturers. Tents often were abandoned when the Army mobilized quickly, and had to transport more critical equipment, or when they encountered transport difficulties. Soldiers then slept outside, unsheltered. During inclement weather, troops commandeered barns or other structures when available. Soldiers also built makeshift shelters out of branches, brush, and leaves when necessary.

The Continental Navy did not maintain yards to build ships, but contracted with private shipyards. The U.S. government later acquired some of those private shipyards, including facilities located in Norfolk, Virginia, and Portsmouth, New Hampshire. The Navy also borrowed ships from France. Sailors lived aboard the ships and slept in hammocks below deck.



Soldiers' Wood Hut,
Valley Forge, Pa.

CARLISLE BARRACKS, PENNSYLVANIA

Established 1757
Carlisle Indian School (1879-1918)
Currently U.S. Army War College

National Register of Historic Places
National Historic Landmark



Hessian Powder Magazine

Military Training

During the Revolution, soldiers and sailors received minimal formal training. There was no time or money for recruit or officer training programs. Instead, the Continental Army and Navy relied on the collective colonial experience gained from a long European military tradition and in more than 150 years serving in local colonial militias. The immediacy of the Revolution precluded recruit or officer training programs or schools.

A turning point in soldier training came during the winter of 1777-1778 at Valley Forge, Pennsylvania, with the arrival of Friedrich Wilhelm von Steuben, a Prussian Army captain. Von Steuben wrote an infantry training manual that the Army used for the next 25 years. Troop training focused on streamlined European army drills, efficient weapons firing, equipment care, and hand-to-hand bayonet combat. In addition, von Steuben reorganized the troops for greater efficiency. An important reason for von Steuben's success was his approach and philosophy. He recognized the distinction between European professional soldiers and American citizen soldiers who normally opposed a standing army. He motivated soldiers with "trenchant good humor and vigorous profanity."

In the Navy and the Marine Corps, enlisted men and officers were expected to know their jobs upon enlistment. In establishing the Continental Marines on November 10, 1775, the Continental Congress emphasized "that particular care be taken, that no persons be appointed to office, or enlisted into said Battalions, but such as are good seamen, or so acquainted with maritime affairs as to be able to serve to advantage by sea when required."



1790-1860 THE EARLY REPUBLIC

With the close of the American Revolution, the new republic dramatically reduced the size of the Army and disbanded the Navy and Marines. However, soon afterward, European instability and unrest on the frontier spurred support for a standing military for national defense. As a result, Congress authorized funds for the construction of ships, shore establishments, coastal fortifications, and frontier forts. Congress formally established the Navy Department and the Marine Corps in 1798.

Re-established military forces addressed threats domestically and abroad: Indians threatened settlers on the frontier, pirates threatened American commerce abroad, and the country's neutral status in the war between Britain and France was in danger. On June 19, 1812, the United States declared war on England for seizing American ships and forcing sailors into service for the Royal Navy, and for arming Indians on the frontier. This conflict, known as the War of 1812, ended with the Treaty of Ghent in 1814. Frontier forts and Navy harbors were built in the Northwest Territory during this period to protect settlers from British and Indian threats and to maintain the country's hold on the land.

War with Mexico began in 1846 over disputes about the boundary of Texas and California's declaration of independence from Mexico. At the war's end in 1848, the United States gained California, Nevada, Utah, and parts of New Mexico and Arizona. Frontier posts were built in the southwest to protect the nation's new holdings.

Nevertheless, throughout this period, Americans were ambivalent in their support for a standing military. The country recognized the need to protect the expanding interests of the nation, yet was reluctant to support military spending. Army and Navy installations during this period reflect this national attitude.

Military Construction

Construction during this period focused on defense and is represented in coastal forts, frontier installations, and shipyards. The Army Corps of Engineers designed and constructed forts to defend major harbors and naval shipyards. The Army began building a system of coastal forts in 1794. In 1807, as the threat of war with Great Britain grew, Congress authorized the construction of more forts. Following the War of 1812, a more ambitious program of coastal fortifications was constructed. This "third system" featured enclosed masonry fortifications with tiers of casemates, which were partially enclosed areas from which guns were fired through portals in the walls. These casemates were used as military quarters as well as defensive positions.

Frontier Army forts often were temporary. They were located strategically to protect major transportation routes and northern borders. The first forts were built east of the Mississippi River during the early nineteenth century to protect what was then the "Northwest," an area comprising present-day Ohio, Indiana, Michigan, Illinois, and Wisconsin. As security threats diminished in the Northwest, the Army directed its attention to the lower Mississippi Valley. The Army also established forts west of the Mississippi River as settlement accelerated into regions acquired through the Louisiana Purchase (1803), the Oregon Treaty (1846), and the Treaty of Guadalupe Hidalgo (1848).

Frontier forts typically were small. They incorporated housing for officers and troops organized around a central parade ground. Forts were surrounded by wooden palisades, while posts were open installations. Army troops built forts and posts under the direction of the Quartermaster.

By 1802, the Navy Department had acquired six shipyards. Four more yards were established by 1853. Shipyards supported ship construction, repair, and supply. Industrial facilities at shipyards included wharves, dry docks, warehouses, ropewalks, sail lofts, shops, and ship houses. Shipyards also contained officer housing areas for the yard commandant and key officers. In 1842, the Navy created the Bureau of Yards and Docks, which designed and constructed shipyard buildings. By 1853, a civil engineer was assigned to each shipyard to oversee construction of buildings, docks, and wharves. The Marines provided security and defense for the Navy installations; the Marines were billeted in barracks located within the yard. The Marine Corps Barracks in Washington, D.C., the nation's oldest continuously active Marine Corps installation, was established in 1801 when command headquarters was transferred from Philadelphia. The headquarters was moved in 1901, but the Marine Corps commandant's residence remains.

UNITED STATES NAVAL ACADEMY, MARYLAND

Founded 1845

Ernest Flagg designed academic campus in Beaux-Arts style (1899)

Naval Academy Chapel (1904-1908)

Tomb of John Paul Jones

National Register of Historic Places

National Historic Landmark



FRONT ELEVATION FOR FIELD OFFICERS AND CAPTAINS' QUARTERS.

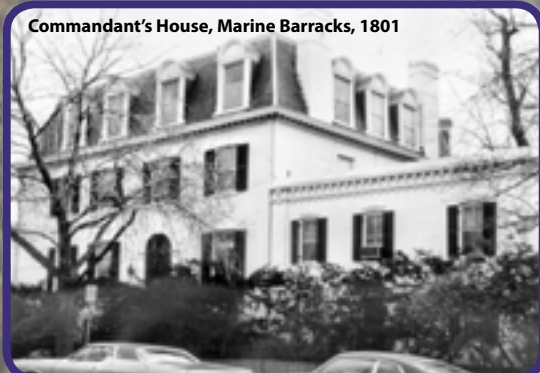
Note: This elevation may be used instead of the one on plan 1 for field officers and captains' quarters existing on the same line the wall window. The entrance is presently located where the one of each window should side by side up in the wall line, see Plan of Garrison plan 11. The door on plan 1 is not applicable also to this elevation.

1790-1830

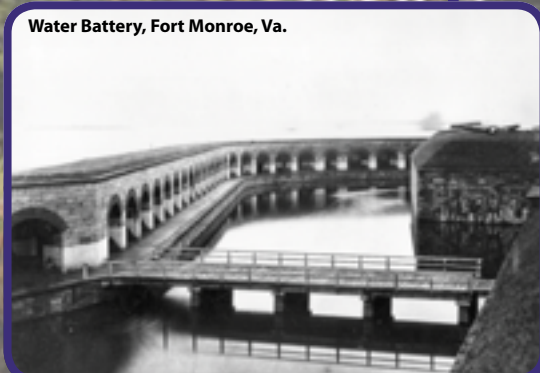
- 1794** Army begins adding to coastal fort system with simple timber and earth structures
- 1794** Congress establishes Navy of six frigates administered by War Dept.
- 1794** Armories open at Springfield, Mass. and Harper's Ferry, Va. (present-day W.Va.)
- 1795** Treaty of Greenville opens Northwest Territory to trade and settlement
- 1797** U.S. frigates *United States*, *Constellation*, and *Constitution* launched
- 1798** Navy Dept. re-established
- 1798** Marine Corps re-established with 22 officers and 832 enlisted men
- 1799** Army builds Schuylkill Arsenal, Philadelphia
- 1801** Marine Barracks, Washington D.C., established
- 1802** Construction in progress on first six naval shipyards
- 1802** Army re-establishes Corps of Engineers and opens Military Academy at West Point, N.Y. to train officers under Corps oversight
- 1803** Louisiana Purchase
- 1804** Lewis and Clark expedition
- 1807** Second System of coastal fort construction begins
- 1812** Quartermaster Dept. re-established to supply Army
- 1813** Funds authorized to erect ship houses in which to build Navy ships
- 1815** War of 1812 ends with Treaty of Ghent
- 1815** War Dept. creates boundary protection plan for more coastal forts on Atlantic Coast and Great Lakes, and more frontier defenses
- 1815** Congress funds larger Navy fleet and more shore facilities
- 1816** Congress appoints board to form long-range plans for coastal defenses
- 1818** Army Medical Corps organized
- 1818** Quartermaster Dept. assigned to build temporary Army posts
- 1819** First fort built west of Mississippi River, Ft. Atkinson in present-day Nebraska
- 1819** U.S. obtains Florida from Spain in Adams-Onís Treaty
- 1821** Congressional report calls for 30 masonry coastal forts with gun portals, forms basis for Third System of coastal forts
- 1825** Responding to study on long-range planning for shipyards, Congress tries to standardize shipyard construction
- 1826** Jefferson Barracks, Mo., first permanent Army post west of Mississippi River
- 1830** Indian Removal Act forces southern Indians to barren western land



Marine Corps Barracks, Portsmouth Naval Shipyard, Maine 1827



Commandant's House, Marine Barracks, 1801



Water Battery, Fort Monroe, Va.



UNITED STATES MILITARY ACADEMY, NEW YORK

Established 1802
National Register of Historic Places

National Historic Landmark

Military Training

The United States Military Academy at West Point, New York, established in 1802, is the nation's first military academy. At West Point, future Army officers completed a curriculum emphasizing engineering, military science, and liberal arts.

The United States Naval Academy was established in 1845 in Annapolis, Maryland, to prepare officers for Navy command.

The Artillery School of Practice, established in 1824 at Fort Monroe, Virginia, was the first specialized military training school. Soldiers received focused instruction in firing artillery.

By 1850, the Army developed a system of recruit depots where soldiers were trained before permanent unit assignment. Most soldiers acquired military skills during active military service. Sailors enlisted in the Navy honed their skills at sea.

1830-1860

- 1830** Naval Observatory established in Washington D.C.
- 1833** Navy dry docks open at Norfolk and Boston yards, 19th century engineering feat
- 1836** Battle of the Alamo
- 1836** Congressional report lists 38 coastal Army forts
- 1842** Bureau of Yards and Docks created to build Navy shore facilities
- 1842** Bureau of Yards and Docks expands shore facilities
- 1843** Navy builds first western shipyard, in Memphis, Tenn.
- 1845** Naval Academy established at Annapolis, Md.
- 1845** U.S. annexes Texas from Mexico
- 1846** Pres. James K. Polk declares war on Mexico after disputes over Texas boundary and California's declaration of independence from Mexico
- 1846** Oregon Treaty gives present-day Oregon and Washington to U.S. and establishes 49th parallel as U.S. boundary to Pacific Coast
- 1848** Mexican War ends with Treaty of Guadalupe-Hidalgo. U.S. gains California, Nevada, Utah, and parts of New Mexico and Arizona
- 1849** Gold in California sparks migration west. Forts protect travelers on westbound trails
- 1849** Vancouver Barracks, Wash. established
- 1850** Recruit depots open at Carlisle Barracks, Pa. for mounted soldiers, and Ft. Columbus, N.Y. and Newport Barracks, Ky. for infantry and artillery
- 1854** Mare Island Naval Shipyard, Calif. becomes first West Coast naval shipyard
- 1857** Coal station opens at Key West, Fla., for new steam-powered Navy



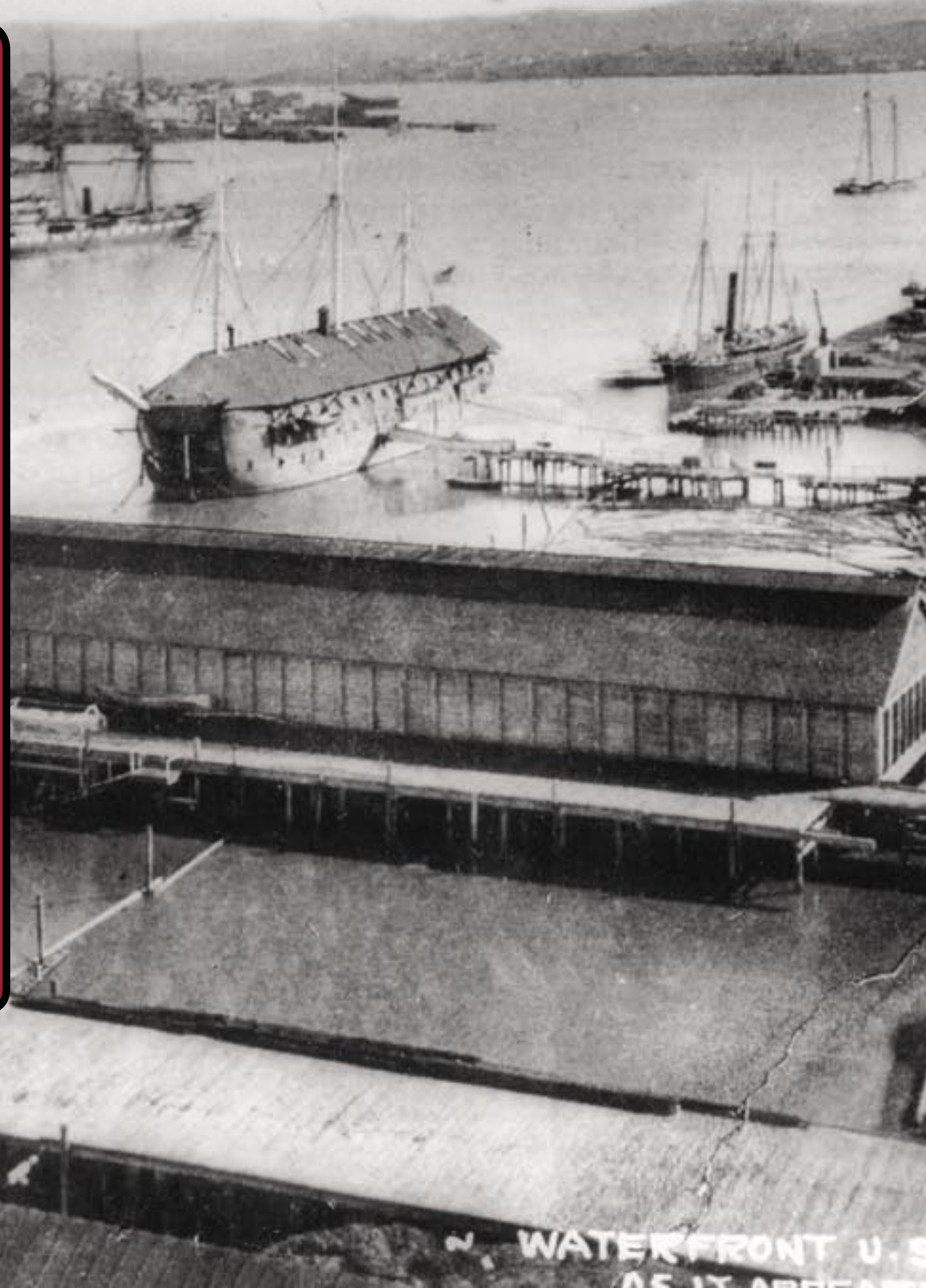
Battle Monument,
United States Military Academy

1860–1890 Move Toward Modernization

The Civil War required the United States Army and Navy to focus entirely on defeating the Confederacy. Military construction was largely temporary, intended for immediate use during the war. Both Confederate and Union troops were sheltered in temporary encampments. While traveling, they used tents, or built temporary encampments for shelter during longer engagements. Both armies built earthworks at strategic locations, such as Washington, D.C. Most were abandoned after the war. The Army built general hospitals that were more permanent than earlier wartime hospitals, which, coupled with advances in medicine, reduced the death rate compared to earlier wars. By the end of the war, 204 general hospitals were constructed, with 136,894 beds.

The other major military focus of this period was the series of clashes between the Army and Native American tribes for control of western territory. Stationed throughout the west in small posts, Army troops were responsible for escorting tribes to reservations, enforcing Federal orders confining the tribes to reservations, protecting white settlers, and preventing white settlers from encroaching on Indian lands. Battles occurred throughout this period from Texas to the Canadian border. The last battle of the so-called “Indian Wars” occurred in 1890 at the Battle of Wounded Knee, in South Dakota. With the threat of uprisings virtually eliminated, the Army no longer needed its frontier posts and began to consolidate them into larger installations.

Immediately after the Civil War, the debt-ridden government was unwilling to expend money or resources on the military. That changed by the mid-1870s and 1880s, and the military took steps towards modernization. The Army drew standardized building plans in an initial effort to improve living conditions on frontier posts. The Navy phased out antiquated wooden ships. Both services built specialized installations and increased training both for officers and enlisted personnel.



1860-1888

- 1861 Civil War starts with Confederate attack on Ft. Sumter, S.C., first American conflict to mobilize many troops
- 1861 First military wartime use of balloons to monitor troop movements
- 1861 Army Balloon Corps formed, abandoned in 1863
- 1861 First naval battle, at Pensacola shipyard, Fla. Confederates win, Union retakes in 1862
- 1862 Army begins building general hospitals for war wounded
- 1862 Rock Island Arsenal, Ill., built as one of three Midwest storage and repair depots
- 1862 U.S.S. *Monitor* and C.S.S. *Virginia* (formerly U.S.S. *Merrimac*) meet at Hampton Roads, Va., in 1st naval battle of ironclad vessels.
- 1862 African Americans authorized to serve in Union Army
- 1863 U.S. Army Signal Corps established
- 1863 Draft Act of 1863 goes into effect
- 1864 Arlington National Cemetery established
- 1864 Union Quartermaster Corps creates standardized barracks plans
- 1865 Confederate Gen. Robert E. Lee surrenders at Appomattox, Va.
- 1865 New rifled artillery penetrates masonry coastal defenses, making them obsolete
- 1866 Army Engineer School moves from West Point to Ft. Totten, N.Y.
- 1867 Alaska Territory purchased from Russia
- 1869 Torpedo School established at Newport, R.I.
- 1870 Quartermaster Gen. Montgomery Meigs begins index of buildings at military posts
- 1870 Signal Corps begins observing weather and signaling storm warnings
- 1872 Quartermaster Gen. Montgomery Meigs creates plans for barracks, officer's quarters and other buildings to standardize Army construction
- 1876 Sioux defeat Gen. George A. Custer at Battle of Little Bighorn, last Indian victory
- 1879 Electric lights installed aboard a vessel, the *Jeanette*
- 1878 War Dept. begins upgrading living conditions and consolidating Army posts
- 1880 Navy phases out wooden ships, builds three steel cruisers
- 1883 Systematic training of Navy recruits begins at Newport, R.I.
- 1884 Naval War College established at Newport
- 1885 Endicott Board recommends new type of coastal artillery battery for strategic coastal locations
- 1887 Army Hospital Corps organized
- 1888 First Army gun factory built at Watervliet Arsenal, N.Y.

Standardized Plans at Frontier Posts

After the Civil War, the Army maintained its system of frontier posts as more people settled in the West. Soldiers focused on enforcing Federal policy relating to Indian tribes, both those native to the area and those transferred from the East. Soldiers were responsible for escorting Indians to reservations, forcing non-compliant tribes to obey Federal orders confining them to reservations, protecting white settlers, and preventing settlers from encroaching on reservation land. Conditions slowly improved at frontier posts. Standardized building plans ensured more uniform building quality. Unofficial 1860 regulations described how to lay out a post, and contained drawings and cost estimates for constructing several types of buildings, including barracks, quarters, hospitals, storehouses, offices, stables, guardhouses, and chapels. These plans represented an attempt to standardize construction, but depicted building examples already in use. Similar plans were developed in 1870 and 1872. Quartermaster General Montgomery C. Meigs began an inventory of post layouts and building plans in the early 1870s. The Army adopted new standardized plans in the late nineteenth century, when posts were consolidated into larger installations and small frontier posts no longer were needed.

Navy Modernization

The Navy embraced new technologies in the 1880s, when the service began phasing out antiquated wooden ships. The Navy built three steel cruisers, the *Atlanta*, *Boston*, and *Chicago*, which normally used sail power but relied on steam power during battles. After these ships were completed, the Navy turned to larger battleships and auxiliary vessels, such as coal ships and escort ships. A lack of funding for shipyard maintenance made construction difficult. The Navy relied on private contractors because its own naval yards could not support ship construction. In the 1890s, the yards were improved to accommodate the new steel ships.

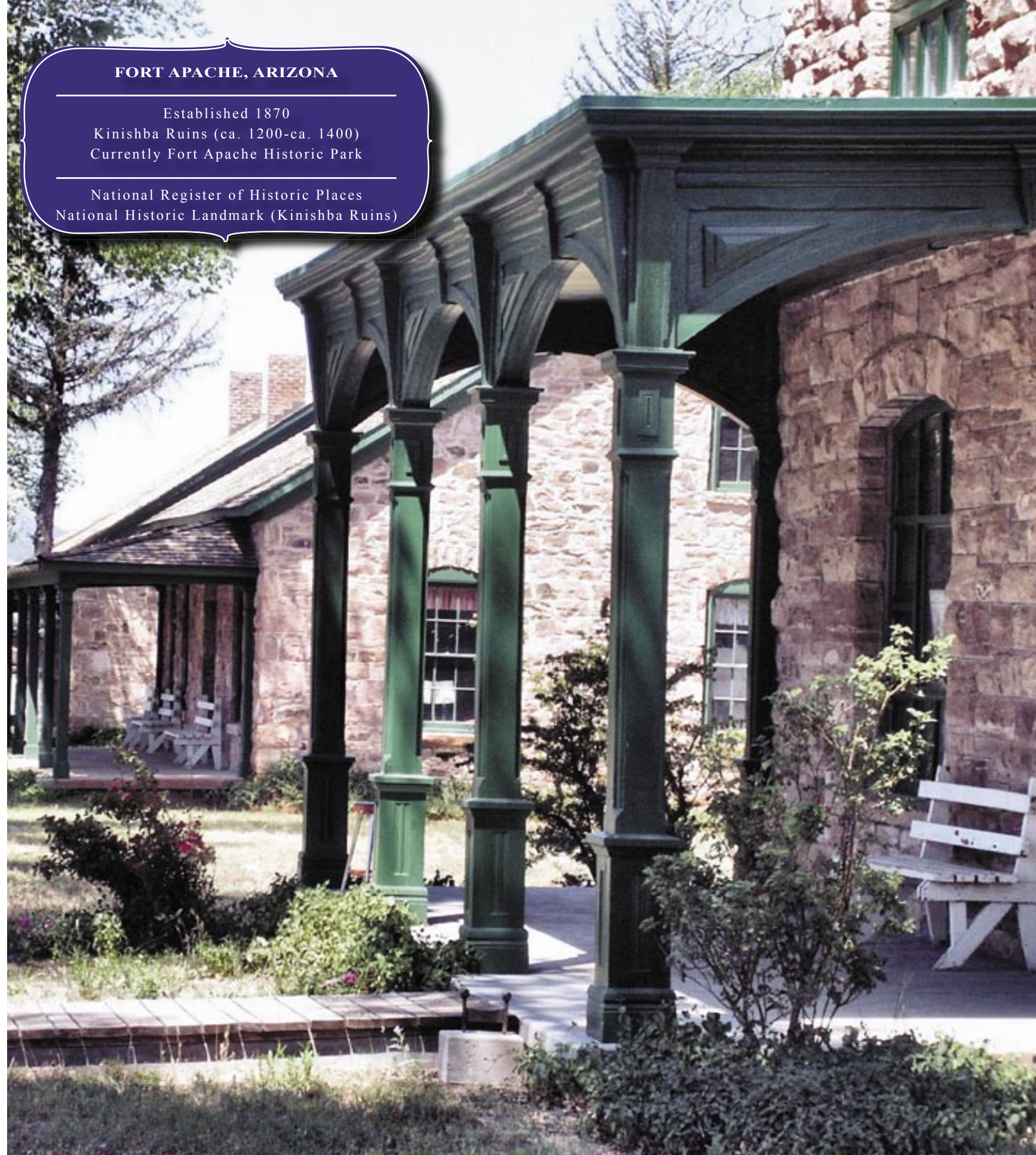


Nineteenth-century Marines of the U.S.S. Alliance manning 3-inch rifled gun

FORT APACHE, ARIZONA

Established 1870
Kinishba Ruins (ca. 1200-ca. 1400)
Currently Fort Apache Historic Park

National Register of Historic Places
National Historic Landmark (Kinishba Ruins)



1889-1890

- 1889 Navy tests heavy guns at Indian Head, Md., replacing Annapolis Proving Ground
- 1890 Steamer *Baltimore* converted for use as mine layer at Charleston Navy Yard
- 1890 Chiefs Sitting Bull, Big Foot, many others killed at Wounded Knee, last battle of Indian Wars



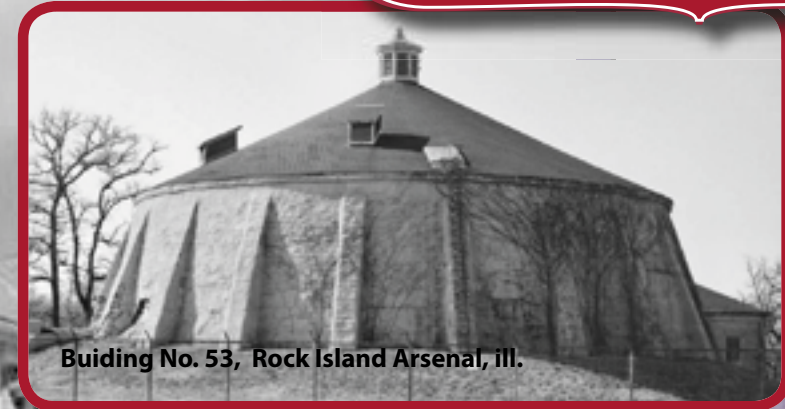


Buiding No. 37, Fort Leavenworth, Kan.

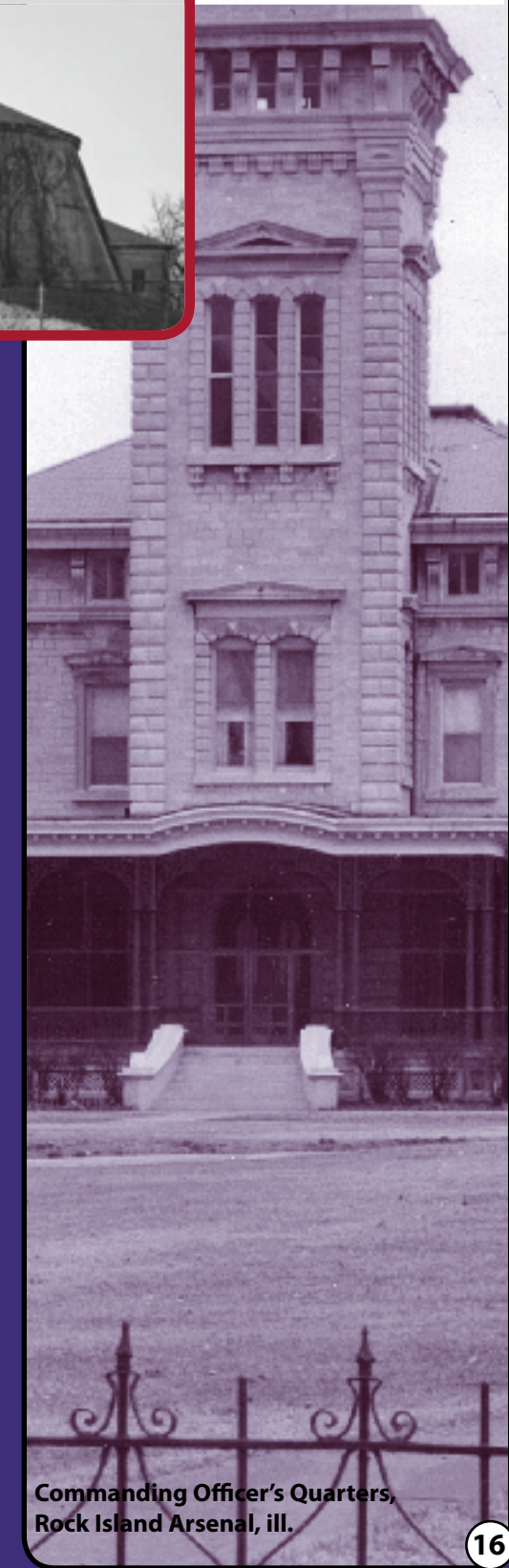
ROCK ISLAND ARSENAL, ILLINOIS

Established ca. 1861-1865
Fort Armstrong (1816-1836)

National Register of Historic Places
National Historic Landmark



Buiding No. 53, Rock Island Arsenal, ill.



Commanding Officer's Quarters,
Rock Island Arsenal, ill.

Military Training

Immediately after the Civil War, low military appropriations resulted in limited training opportunities for officers and enlisted men. By the early 1880s, advanced education and professional development gradually increased as the military services became more sophisticated and professional. Officers were afforded ongoing educational opportunities beyond the training provided at service academies. These opportunities included specialized training and broader education in military theory. Limited specialized training was available to enlisted men.

Army artillery officers received advanced instruction at the Artillery School at Fort Monroe, which was revived in 1868. A group of officers from the Army Corps of Engineers established the Essayons Club at Willets Point, New York, to teach military engineering. The organization became the Engineer School of Application in 1875. Commanding General William T. Sherman established the School of Application for Infantry and Cavalry at Fort Leavenworth, Kansas in 1881. Congress authorized the Cavalry and Light Artillery School in 1887.

Advanced education and professional development also increased in the Navy. A Torpedo School was established at Newport, Rhode Island, in 1875. In 1884, this school became the Naval War College, an institution open to Navy and Marine Corps officers.

The services soon offered more training for enlisted men. Telegraphy and weather forecasting were offered at the Signal School at Fort Whipple, Virginia, in 1869. The Navy began training enlisted men systematically in 1883 at Newport, and offered technical education to sailors at the Washington Navy Yard through courses in ordnance and electricity. Newport also offered a course in torpedo warfare.

Specialized Installations

The modernizing Army and Navy built new types of installations to support their evolving missions. The Army built its first installation devoted to ordnance testing in 1874 at Sandy Hook Proving Ground, New Jersey. Sandy Hook Proving Ground had longer firing ranges, better suited for improving artillery technology than the original range at Fort Monroe, Virginia. The first Army gun factory was established in 1888 at Watervliet Arsenal in New York. The Navy opened its first proving grounds in Annapolis, Maryland in the early 1880s. When the area around the Annapolis Proving Ground became too populated to safely serve as a weapons range, the Navy moved the proving ground south to Indian Head, Maryland in 1889. The Navy experimented with the newly invented torpedo at the Torpedo Station in Newport, Rhode Island, a former Army coastal artillery fort acquired in 1869.

The Army, Navy, and Marine Corps were transformed from a frontier constabulary and a fleet of antiquated wooden ships to highly trained and well-equipped forces that adhered to the highest professional standards. To achieve this transformation, the services expanded their installations and continued to increase training of officers and enlisted personnel.

*As the influence of the United States in international affairs grew, military involvement increased. The United States sent the battleship *Maine* to Havana, Cuba, in 1896 to protect American citizens and property during that island's rebellion from Spanish rule. The battleship exploded in 1898, which increased tensions between Spain and the United States. Spain declared war on April 24, and Army forces were sent to Cuba, Puerto Rico, and the Philippines. The Army built temporary encampments to gather and train large numbers of troops. The Spanish American War ended in 1898, but troops remained in Cuba until 1902 to establish a provisional government. The Philippines remained a U.S. colony until after World War II. From 1907 to 1914, the Army Corps of Engineers built a canal across the Isthmus of Panama. When the Panama Canal was completed, the Army stationed troops to protect it. The United States nearly became involved in the Mexican Revolution in 1916, when the revolutionary Pancho Villa crossed the border and attacked U.S. citizens. President Woodrow Wilson sent Brigadier General John J. Pershing and thousands of troops from Fort Bliss, Texas, into Mexico in a futile pursuit of Villa. Wilson also sent troops to Haiti and Santo Domingo.*

*At the end of this period, United States military forces faced the prospect of involvement in a larger war in Europe that began on June 28, 1914. Many wanted to enter the war in May 1915, after a German U-boat sank the British passenger ship *Lusitania* despite Wilson's warnings to Germany not to strike neutral ships. Germany pledged to provide warning, but rescinded that offer in February 1917, when it struck the U.S.S. *Housatonic* without warning. In March, the United States learned that Germany was attempting to form an alliance with Mexico against the United States. Congress declared war against Germany on April 6, 1917.*

1890-1917 DEVELOPING A PROFESSIONAL MILITARY FORCE



1890-1911

- 1891 Puget Sound Naval Shipyard, Wash., established
- 1892 Army Signal Corps balloon section re-established
- 1897 Army Bicycle Corps forms at Ft. Missoula, Mont. Corps of African-American soldiers rides to St. Louis to test bicycles for troop transport
- 1898 Battleship *Maine* explodes in Havana Harbor, Cuba. Blaming Spain, Congress recognizes Cuban independence. Spain declares war on U.S.
- 1898 Treaty of Paris ends Spanish American War. Having acquired Spanish holdings, U.S. needs larger Navy and Army
- 1898 Asst. Navy Secretary Theodore Roosevelt sees aviation's potential, tells Navy to track its progress
- 1900 Navy buys submarine, the *Holland*
- 1900 Congress funds balloon house at Ft. Myer, Va., first funding of an air installation
- 1901 To handle larger modern Army, War Dept. increases post sizes instead of numbers
- 1901 Army War College established at Washington Barracks, Washington D.C.
- 1902 Quartermaster Dept. adds non-military buildings to posts, such as exchanges, schools, libraries, gyms, and bowling alleys
- 1904 Navy installs wireless telegraph equipment on ships and shore stations
- 1904 Armament School established at Lowry Field, Colo.
- 1904 Navy opens three shore training stations at Newport, Norfolk, and San Francisco
- 1905 Marine depot opens in Philadelphia to make uniforms, equipment, store supplies
- 1905 Navy assigns ships a home port. Shipyards become installations with resources for sailors and families
- 1905 Secretary of War William Howard Taft continues Endicott Board as Taft Board
- 1908 Army aviation begins with test of Wright brothers airplane at Ft. Myer, Va.
- 1908 Navy begins making torpedoes at Torpedo Station in Newport, R.I.
- 1909 Walter Reed Army Medical Center receives first patients
- 1910 First Army flight west of Mississippi River lands at Ft. Sam Houston, Texas
- 1910 First aircraft launched from ship off Hampton Roads, Va.
- 1910 First aircraft landing on ship, in San Francisco harbor
- 1910 Unrest on Mexican border
- 1911 Congress makes first appropriation of \$125,000 for Army aviation
- 1911 First Navy airfield established at Greenbury Point, Md.



The 1910 Army Aviation program with the Wright B flyer at Fort Sam Houston, Texas



Presidio of San Francisco, Calif., 1898

Military Construction

During the 1890s, the Army began consolidating small frontier forts into larger, permanent installations. The Quartermaster Department increased the use of standardized plans to build these installations. Standardized plans drastically improved the soldiers' quality of life by ensuring that well-designed buildings with more amenities were constructed, leading to more healthful living conditions. In addition, these standardized plans assured that new installations would contain permanent buildings and design elements reflecting the Army's increased prestige. The buildings depicted in the standardized plans featured early American architectural styles, primarily Georgian and Federal, that were popular during the Colonial Revival movement of the 1890s. These plans were drawn by professional civilian architects hired by the Quartermaster Department beginning in the early 1900s. Aesthetic elements such as basic landscaping improved the appearance of the installations.

City planning concepts were incorporated into the designs of several types of installations. The Army War College at Washington Barracks (now Fort McNair in Washington D.C.), and additions to the U.S. Military Academy, were designed using precepts of the Beaux-Arts movement, such as symmetry, alignment of buildings along an imaginary line, and classically inspired monumental architecture. The Navy applied Beaux-Art concepts while modernizing installations to raise its fleet to the status of other world powers. These concepts are present in shipyard buildings of this period, such as the Naval Observatory in Washington D.C., the Naval Academy in Annapolis, Maryland, and Great Lakes Naval Training Station in Illinois.

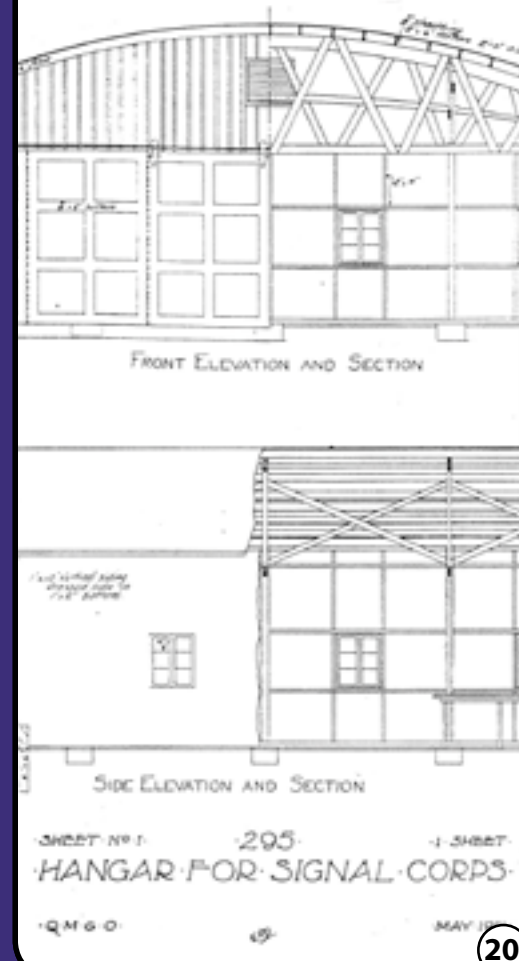
As the Marine Corps gained status, more funds were available for the construction and improvement of Marine Corps barracks at Navy yards. The number of Marine Corps buildings constructed at a yard was small, comprising one or two barracks, officer housing, and support buildings. However, the buildings were arranged according to a planned layout with barracks facing a parade ground. Marine Corps buildings were designed by civilian architects using popular architectural styles.

Col. Theodore Roosevelt and his Rough Riders after the Battle of San Juan Hill, 1898



1911-1916

- 1911** First aircraft-to-ground radio communication occurs at Selfridge Field, Mich.
- 1911** Navy public works projects consolidated under Bureau of Yards and Docks, controlled by Corps of Civil Engineers
- 1912** Flying operations begin at North Island, San Diego, Calif.
- 1913** Arlington Naval Radio Station established
- 1913** Army Balloon Schools consolidated at Ft. Leavenworth, Kan.
- 1914** Army Aviation Section created in Army Signal Corps
- 1914** Panama Canal opens
- 1914** Marine Corps Recruit Depot established at San Diego
- 1914** Naval aeronautic facility established at Pensacola Navy Station
- 1915** Navy, Army transmit first transcontinental radio message
- 1915** Army Signal Corps starts aviation training center at North Island, San Diego
- 1916** Navy opens submarine base and school at New London, Conn.
- 1916** National Defense Act boosts company strength to 100, requiring larger barracks
- 1916** Renowned architect Albert Kahn designs early airfields





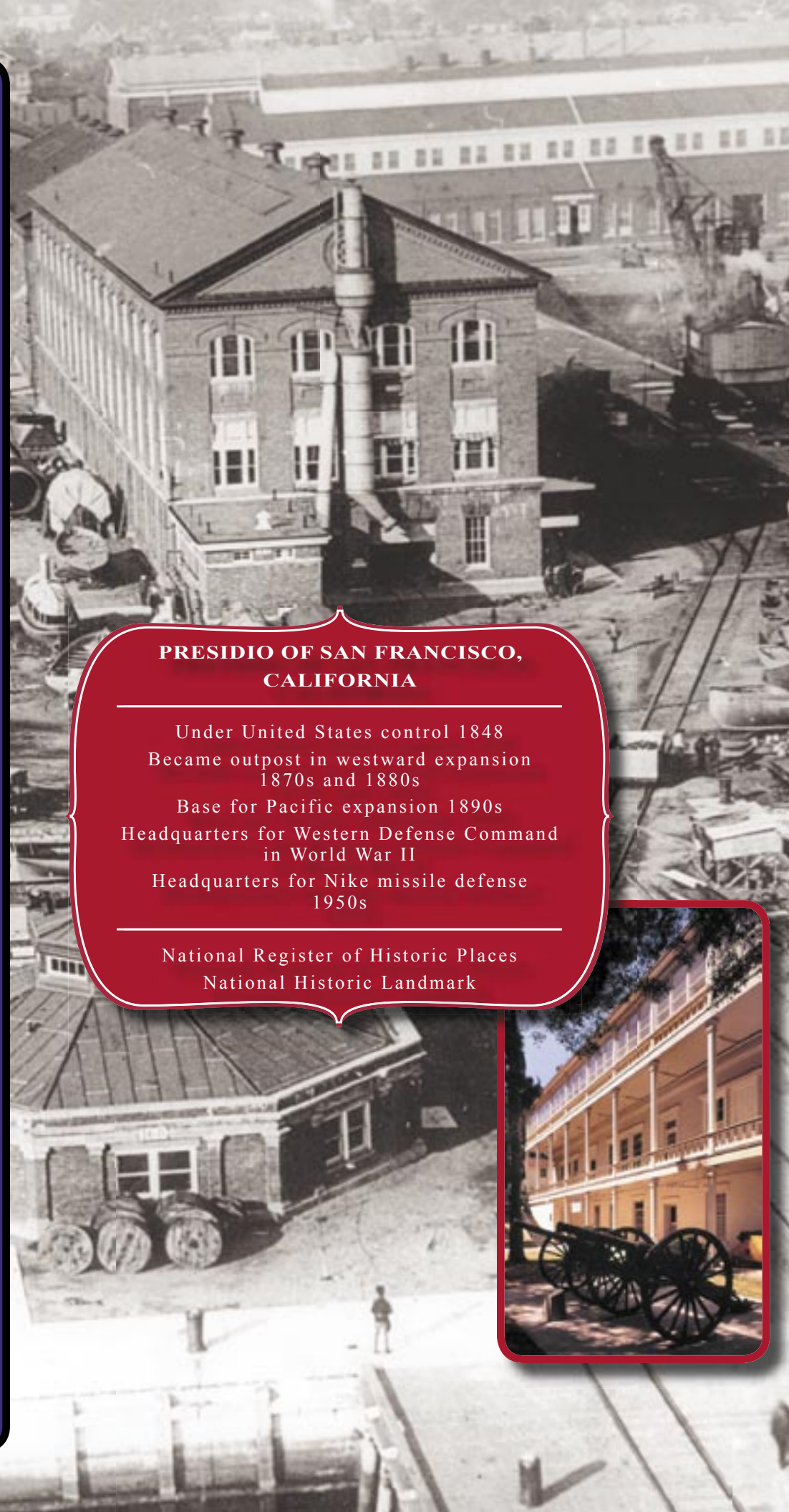
Education

Educational opportunities in the Army and the Navy and Marine Corps grew at all levels. The senior service schools at Fort Leavenworth and Newport continued to develop, and more training and education programs were offered for junior officers and enlisted personnel. Training and education provided soldiers and sailors with the technological expertise that helped transform the United States military from a collection of frontier forts and aging wooden ships into a modern force competitive with other world powers.

In the Army, Leavenworth's curriculum expanded, and the school shifted its focus to training senior officers to command large formations. The Army War College was built at Washington Barracks in Washington D.C. to educate senior officers in war strategy. Schools opened to train junior officers in their respective branches of the Army, such as artillery or engineering. Navy and Marine Corps officers continued to attend the Naval War College at Newport, or to attend the Naval Academy's new post-graduate school. The Marine Corps established several of its own specialized schools. The first was the School of Application at the Marine Corps Headquarters in Washington, D.C. Other schools included a Marine Officers School at the Navy Station in Port Royal, South Carolina, the Advanced Base School in Philadelphia, a Field Artillery School in Annapolis, and a Machine Gun School in Pensacola, Florida.

Training also increased for enlisted men in all the military branches. In 1904, the Navy stopped training new recruits on sailing ships and built shore training stations at Newport, Norfolk, and San Francisco. Another facility, Great Lakes Naval Training Station, was built north of Chicago in 1905. By 1915, the Navy was operating several technical schools.

Prior to World War I, the Army and Navy each operated only one small aviation school. At that time, flight technology still was under-developed and of limited use.



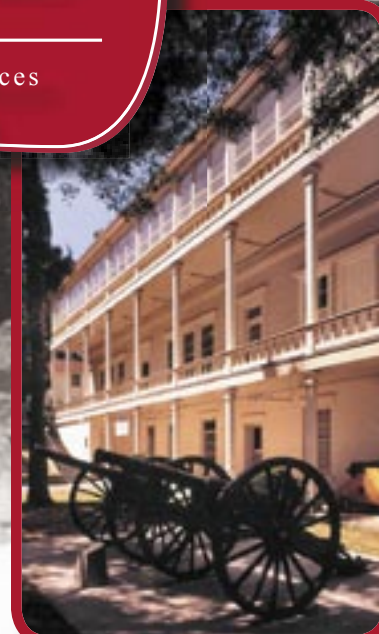
PRESIDIO OF SAN FRANCISCO, CALIFORNIA

Under United States control 1848
Became outpost in westward expansion
1870s and 1880s

Base for Pacific expansion 1890s
Headquarters for Western Defense Command
in World War II

Headquarters for Nike missile defense
1950s

National Register of Historic Places
National Historic Landmark



1917-1919 WORLD WAR I



I WANT YOU

Upon entering World War I in April 1917, the United States launched a massive mobilization effort to provide soldiers, weapons, and other resources to fight the war. The Army, Navy, and Marine Corps built camps to house and train thousands of recruits and officers, and built other facilities for the war effort. The role of aviation expanded as the Army, Navy, and Marine Corps recognized its strategic advantage in winning the war. Planes were used for aerial combat, bombing missions, and enemy reconnaissance. This mobilization effort, following the earlier trends towards modernization and professionalism, propelled the United States to the status of a great world power.



Interior, World War I-era barracks, Edgewood Arsenal, Md.

Military Construction

When the United States entered World War I, the Army immediately needed temporary camps to house and train thousands of soldiers. The Army Quartermaster Department received orders to build 32 temporary camps by September 1, and established a committee of men with architectural and construction expertise to lead the effort. These temporary camps contained barracks, laundries, bakeries, mess halls, hospitals and infirmaries, storehouses, stables, latrines, and administrative buildings. Most were one-story, wood-frame buildings, except for some infrastructure buildings constructed of brick.

The Navy built temporary buildings at training stations to house its additional recruits. In addition, the Navy began a massive construction program at existing shipyards. This program included slips for building ships, machine shops, structural shops, cranes, and related industrial buildings. These buildings were permanent masonry construction because they needed to be strong enough to handle the weight of machinery suspended from walls and ceilings. Construction consisted of structural steel frame covered in tile, concrete, or brick.

The Army and the Navy built new airfields containing hangars, laboratories, and housing. The armed forces established aviation training schools and built or acquired supply and repair depots. The Army Signal Corps named renowned industrial architect Albert Kahn its Architect-in-Chief in January 1917. Kahn designed a permanent airfield at Langley Field in Virginia and developed standardized plans for temporary airfields.

1917-1919

- 1917** U.S. enters World War I
- 1917** Bureau of Yards and Docks builds Naval Air Stations between Nova Scotia and Panama Canal to defend coasts and protect Allied shipping
- 1917** Navy builds aircraft factory at Philadelphia Navy Yard. Steel and glass construction represents use of new materials and construction methods
- 1917** Selective Service Act drafts men for the war
- 1917** Army Cantonment Division established to oversee all Army construction but forts
- 1917** Bureau of Yards and Docks builds temporary Navy camps to increase Navy training facilities. Many based on standardized plans
- 1917** Quantico Marine Base established
- 1917** Construction of World War I cantonments begins
- 1917** Aviation Act authorizes more flying fields, aircraft, supplies, and personnel
- 1917** Norfolk Navy Base built as Atlantic Fleet headquarters
- 1917** Ft. Douglas, Utah used as prisoner of war camp
- 1918** Fitzsimmons Army Medical Center, Colo. established
- 1918** Armistice ends World War I. Military spending cut, surplus aircraft sold, many wartime flying fields and camps abandoned
- 1919** Treaty of Versailles officially ends World War I



FORT RILEY, KANSAS

Established 1853
School for Cavalry and Light Artillery
Trained soldiers in WW I and WW II
Home of 1st Infantry Division (1955)

National Register of Historic Places



Building No. 100, Fort Riley, Kan.

Barracks, Edgewood Arsenal, Md.



BROOKS AIR FORCE BASE, TEXAS

Established 1918 by Army Signal Corps
Designed by noted architect Albert Kahn

National Register of Historic Places (Hangar 9)
National Historic Landmark (Hangar 9)



Hangar 9, Brooks Air Force Base, Texas

Military Training

Thousands of Army recruits were trained at the 32 large temporary camps built to mobilize troops for the war. Specialized training facilities were built for soldiers in the technical branches, such as artillery, infantry, engineering, the Signal Corps, and the Quartermaster Corps. Although the Navy built a few temporary camps to train new recruits, most sailors were trained at the four existing training stations expanded through the addition of temporary buildings. Specialized schools were established at existing facilities. Great Lakes Naval Training Station in Illinois trained officers. The Marine Corps began its renowned recruit training program at Parris Island, South Carolina, and trained officers and enlisted men at a new base in Quantico, Virginia.

To train pilots and associated personnel, the Army built several airfields and began a mechanics school. Although aviation facilities were simple since the development of aviation was in its infancy, these advancements were significant because they showed that Army aviation was moving toward independence from ground forces. Many of these fields later became permanent Air Force bases. The Navy trained pilots and mechanics at Pensacola, Florida, and at temporary shore facilities.



Flying training at Kelly Field No. 2, Texas, World War I



With the close of World War I, American interest in military affairs declined sharply. The war left an enormous debt that limited military expenditures during the early 1920s. The stock market crash in 1929 and the Great Depression of the 1930s also resulted in limited appropriations for the military. Even though funding was not available for increasing the size of the military or its installations, physical improvements were made to existing installations through the sale of surplus property. Modern urban planning concepts were applied in installation design. During the 1930s, funding for military construction was incorporated into public relief programs, such as the Works Progress Administration and the Public Works Administration.

International events during this period supported the belief that large armed forces would be unnecessary in the future. The League of Nations, the Washington and London naval disarmament conferences, and the Kellogg-Briand Pact sought to find peaceful ways to settle conflicts. Naval forces were reduced through a series of international disarmament agreements. Only with the rise of international tensions during the mid-1930s did this hope for permanent peace prove illusory.

For the U.S. military, this time was one of mixed progress. All services languished under restricted appropriations and slow growth. The size of the U.S. military was larger than before World War I. Throughout the inter-war period, military strength remained constant and totaled between 220,000 and 230,000. Nevertheless, this period provided the military with time to implement important administrative reforms and developed new technologies that produced a strong, well-trained, and organized force. New technologies, especially those related to aviation, tanks, and motor transportation, were integrated into the services. Strategic planning aided the military to anticipate battle scenarios with a variety of enemies. Officers who later emerged as leaders were trained during these years. As a result, the United States military entered World War II as a powerful force that was instrumental in the Allied victory.

1919-1940 The Inter-War Years



1919-1930

- 1919** Navy authorizes construction of first rigid airship, or dirigible
- 1919** Battleship *California* is first capital ship, or largest class of ship, built on the West Coast
- 1919** Submarine base established at Key West, Fla.
- 1919** Pope Field at Ft. Bragg, N.C. established for balloon training.
- 1919** Balloon and Airship School established at Brooks Field, Texas
- 1920** Defense Act establishes nine corps areas in continental U.S., abolishing previous geographic organization
- 1920** Army Construction Division becomes Construction Service of Quartermaster Corps, stops reporting to Secretary of War
- 1921** Lakehurst Naval Air Station, N.J., established
- 1921** Secretary of War John Wingate Weeks announces postponement of permanent Army construction when possible
- 1922** Japanese presence in Pacific prompts division of Navy fleet into battle fleet in Pacific and scouting fleet in Atlantic
- 1922** Government drastically reduces numbers of military personnel
- 1922** First use of ice box in military quarters occurs at Ft. Myer, Va.
- 1922** Veterans Administration asks Navy Bureau of Yards and Docks to build new hospitals. They are built at Tupper, N.Y.; Gulfport, Miss.; and St. Cloud, Minn.
- 1922** Navy converts ship into aircraft carrier
- 1923** Walter Reed General Hospital designated Walter Reed Army Medical Center when Army Medical School relocates to the campus
- 1924** Parachute school established at Chanute Field, Ill.
- 1924** Military aircraft inventory lists 754 planes, many obsolete and left from World War I
- 1926** Army Air Corps established
- 1926** Peacetime Army permanent construction begins with funds from surplus property sale authorized in Army Surplus Property Act
- 1928** Army briefly experiments with tanks
- 1928** First simulated assault by paratroopers at Brooks Field, Texas
- 1928** First automatic electrical generating station built at Puget Sound Navy Yard
- 1928** Modern urban planning concepts adapted to installation design
- 1928** Air Corps pilot training centralized at Randolph Field, Texas
- 1929** Stock market crash
- 1930** First military aircraft lighting and beacon system tested at Pope Field, N.C.

Military Construction

Army installations initially suffered from neglect following World War I. In 1926, Congress authorized the Army to sell part or all of 43 military installations and to place the proceeds in a Military Post Construction Fund. The money was used to build barracks, housing for non-commissioned officers and officers, and hospitals. The Air Corps Act of 1926 authorized a five-year expansion of aviation personnel and aircraft, which required new installations to accommodate the special requirements of the newly established Army Air Corps.

The new permanent installations constructed during this period were designed in accordance with prevailing concepts of city planning, such as unity and coordination of parts; harmony in design of recurring patterns; natural beauty; balance along an imaginary line; and radiation, meaning that parts of a community radiate from the center and return. George B. Ford, a respected urban planner and a consultant to the Quartermaster Corps, advocated efficient, practical designs that also incorporated planning concepts from the City Beautiful and Garden City movements, such as curved streets and vistas.

The Army's planners applied these planning concepts to the design of new permanent installations that contained more land and that quartered more troops than ever before. Functional, hierarchical arrangements of buildings and open space allowed the ordered development of these expanded posts. The Quartermaster Corps issued new standardized plans for all building types. The new designs were created to reflect responsiveness to local climate and to architectural history. The Georgian Colonial Revival style was adapted for use at installations in New England, the Mid-Atlantic, the Midwest, and the Pacific Northwest. The Spanish Colonial Revival style was used in the South, the western Plains, the Southwest, and California. Other regional styles included French Provincial, used in the Gulf states, and English Tudor Revival.

The Navy and the Marine Corps received little construction funding in the 1920s. When war loomed in the 1930s, the Navy received funding for improved ships and expanded shore facilities nationwide, particularly along the Pacific Coast and in Hawaii. Navy leaders believed that the battleship and cruiser would dominate any future war, but they also integrated submarines and aviation into the service and improved its weaponry. Under the direction of the Bureau of Yards and Docks, the Navy modernized its shipyards with the addition of larger industrial buildings to accommodate the construction of larger ships. New training and aviation stations were constructed. These new types of on-shore stations provided amenities to naval personnel, such as recreational facilities, dispensaries, enlisted quarters, additional officers' housing, and mess halls. The various design elements of the new installations were unified, in accordance with city planning principles; local architectural styles often were used.

During this period, the Marine Corps invested its limited funding appropriations in expanding permanent training facilities and in building new aviation facilities.



1930-1941

- 1930** Navy modernizes facilities with new lighting and generating systems
- 1932** Emergency Relief and Construction Act assigns \$15 million to military housing
- 1933** Franklin D. Roosevelt elected President; New Deal Programs begin
- 1933** Navy airship *Akron* crashes
- 1933** Public Works Administration appropriates \$15 million for military construction
- 1934** Army Air Corps delivers air mail
- 1934** First aircraft carrier built, the *Ranger*
- 1935** General Headquarters Air Force created, operates under General Headquarters based at Langley Field, Va.
- 1935** Tensions with Japan motivate Wilcox Act, authorizing five strategic air bases in U.S. and Alaska and two air depots
- 1937** Dirigible *Hindenberg* catches fire while landing at Lakehurst Naval Air Station, N.J.
- 1938** Congress authorizes expansion of Navy air facilities
- 1938** Work Relief and Public Works Appropriation Act allots Works Progress Administration funds for military construction
- 1939** Germany invades Poland, sparking war declaration by France and England. Roosevelt declares limited national emergency. Army and Navy authorized to increase force levels
- 1940** Roosevelt forms Advisory Committee on Uranium after talks with Albert Einstein
- 1940** Roosevelt seeks \$1.8 billion for defense, another \$896 million and annual industrial production schedule of 50,000 planes. Congress OKs third request for \$1.2 billion. In June, Roosevelt signs Navy bill allocating \$1.3 billion for more military construction. Several more military expenditures authorized
- 1940** Largest Navy expansion in U.S. history authorized. Air arm gets 16,000 more air crew, 10,000 planes. Two-ocean Navy created, 200 more warships authorized
- 1940** Pittman Resolution encourages increase of Latin American defense, OKs munitions sales to western hemisphere nations
- 1940** Congress passes bill appropriating \$100 million to Army and Navy defense housing
- 1940** Selective Service Training and Service Act allows peacetime draft, sets annual training totals of 1.2 million men for active duty and 800,000 men for reserve duty. Lets government take plants unwilling to do defense work
- 1940** Lanham Defense Housing Act allocates \$150 million to defense housing
- 1940** Roosevelt proposes lend-lease program to aid countries fighting Axis
- 1941** Army begins building Pentagon office building in Arlington County, Va.

Training

The Army, Navy, and Marine Corps further improved their education and training systems, producing a force of professionals capable of providing the leadership crucial to victory in World War II. The Army formed two categories of schools. The special service school system, established in September 1919, educated officers and enlisted personnel in the requirements of their specialty, such as infantry or ordnance. The Army's three general service schools educated higher-level officers. They comprised the Command and General Staff College at Fort Leavenworth, which prepared officers for higher command assignments; the Army War College at Washington Barracks (later renamed Fort McNair), which instructed students in analyzing hypothetical war scenarios; and the Army Industrial College, which instructed officers serving in the supply procurement branches.

The Army Air Corps established specialized schools to teach aviation-related skills. The Army Air Corps consolidated its basic flight training at Randolph Field and advanced training at Kelly Field, both in Texas. An Air Service Tactical School educated senior captains and higher-level officers, and a technical school was located at Chanute Field in Rantoul, Illinois.

The Navy and Marine Corps also improved their educational systems after World War I. Navy officers received advanced education at the Naval Academy in Annapolis, or at civilian universities. Senior Navy and Marine Corps officers were educated at the Navy War College. New recruits were trained at Navy training stations, and received advanced training in trades critical to the operation of more sophisticated ships. The Marine Corps built a second recruit depot at San Diego. Quantico remained a Marine Corps recruit depot, but offered officers' training and developed principles for amphibious warfare, a tactic crucial to Allied victory during World War II.

Control Tower, Naval Air Station, North Island, Calif., 1930s



Student Officer Apartment Building, Naval Complex Pensacola, Fla., 1937

FORT BENNING, GEORGIA

Became a permanent installation 1922
Designed by nationally prominent city planner
George B. Post
Yuchi Town (1700s Indian community)

National Register of Historic Places
National Historic Landmark (Yuchi Town)

Building No. 35, Fort Benning, Ga.



1941

- 1941** Extensive defense spending authorized. President's \$17.5 billion budget request allocates \$10.8 billion to military
- 1941** Navy reorganized into three fleets: Atlantic, Pacific, and Asiatic
- 1941** Lend-Lease Act authorized
- 1941** Roosevelt declares state of unlimited national emergency May 27
- 1941** Corps of Engineers takes over Army installation construction from Quartermaster



1941-1945

WORLD WAR II

Between 1939 and 1945, war engulfed the world. In the Pacific area, Japan emerged as a leading Asian power and invaded its neighbors in China and Indochina. In Europe, German armies invaded Poland in 1939. Britain and France declared war on Germany in September 1939, though France surrendered to Germany in 1940. The United States attempted to remain neutral and isolationist, although President Roosevelt supported Britain under the Lend-Lease program and instituted a period of military expansion under the Protective Mobilization Plan. U.S. neutrality ended after Japan attacked Pearl Harbor on 7 December 1941. The United States found itself at war both in the Pacific and in Europe.

During the war, the United States home front was transformed into an “arsenal for democracy” as weapons, ammunition, and supplies were manufactured and shipped overseas to support the war effort. Shipyards, both government and privately owned, operated around the clock to build all types of ships, boats, and submarines. New manufacturing plants were required to produce aircraft, tanks, motorized vehicles, and weapons. Large new ammunition production facilities rose from former agricultural land. Mobilization training camps were constructed to induct and train millions of men into all branches of the armed service.

War industries created thousands of new jobs, often in regions that were previously agricultural. During the course of the war, more than 15 million civilians migrated across the United States to work in wartime industries. Sixty percent of the migrants were women. African-American and other minority workers were employed in ammunition production plants in increasing numbers. Defense workers were housed in quickly constructed housing developments in the vicinity of the defense industries. U.S. citizens contributed to the war effort through recycling and rationing programs.

The military undertook an unprecedented domestic construction program, mobilizing both men and resources, to fight a long-term war in the European and the Pacific theaters. Between 1940 and 1945, the Army spent \$15.3 billion on construction for industrial, training, and support facilities and special projects in the continental United States, while the Navy spent more than \$5.3 billion on new facilities at shipyards, operating bases, training stations, supply depots, and airfields. Military construction on the home front was classified as either permanent or temporary. Permanent construction was used for ammunition production facilities, coastal artillery batteries, and facilities intended for use after the war. Temporary construction was used at mobilization training camps and for buildings that were not intended to last more than five years.



1941-1944

- 1941** Japanese planes attack U.S. Pacific Fleet at Pearl Harbor Dec. 7, also Philippines, Hong Kong, and Malaya
- 1941** U.S. and Great Britain declare war on Japan on Dec. 8
- 1941** On Dec. 11, Italy and Germany declare war on U.S., which reciprocates
- 1942** Battle of Midway ends in U.S. win, begins decline of Japanese military in Pacific
- 1942** Eisenhower becomes Commander in Chief of Allied forces in Europe on June 25
- 1942** U.S. Marines land at Guadalcanal on Aug. 7
- 1942** U.S. Eighth Air Force makes first all-American bombing raid on Europe Aug. 17
- 1942** Military takes over atomic research Sept. 17, precursor to Manhattan Project
- 1942** Army reaches 4,250,000 men on Oct. 14. Goal of 7,500,000 set for late 1943
- 1942** Minimum draft age lowered from 20 to 18 on Nov. 12
- 1943** 55 bombers make first Army Air Forces raid into Germany, against Wilhelmshaven
- 1944** Allies begin invading Europe at Normandy on June 6
- 1944** U.S. Marine forces invade Saipan on June 15
- 1944** U.S. conducts first B-29 raid against Japan in June
- 1944** U.S. carrier-based planes defeat Japan in Battle of the Philippine Sea on June 19.
- 1944** American forces invade Guam on July 21
- 1944** U.S. military forces beat last organized Japanese resistance on Guam on Aug. 10
- 1944** U.S., Britain, and U.S.S.R. meet Aug. 21 to plan United Nations
- 1944** Allies enter Paris on Aug. 25

Military Construction

In 1939, the military numbered slightly more than 306,000 men. At the height of the war (1944-1945), military personnel numbered more than 10 million. The Army mobilized more than 7 million troops, while the Navy mobilized nearly 3 million.

The Army established 118 mobilization training camps and 72 training camps for the Army Air Corps. Some mobilization cantonments were located on existing Army posts while others, especially those constructed for the Air Corps, were entirely new. The most prevalent building type at the camps was the barracks. The barracks typically were two-story, utilitarian buildings constructed of lumber. The simple designs allowed ease of assembly by unskilled workers; they were adapted to an assembly line approach to construction. The barracks were arranged in squares, with shared mess halls and day rooms. Specialized training camps, such as those constructed for the Air Corps, required hangars, shops, and specialized training facilities. Initially, the Quartermaster Corps oversaw all construction. In November 1941, all construction duties were transferred to the Army Corps of Engineers.

The Navy and Marine Corps also faced the daunting task of training new recruits. Although the Navy had expanded its four existing recruit-training stations, the stations were quickly overwhelmed by the large numbers of volunteers who joined after the Japanese attack on Pearl Harbor. During the war, the Navy built three more recruit training stations and 79 airfields consisting of temporary buildings. The Marine Corps expanded its two existing stations at Quantico and Parris Island in 1940, built a third base at Cherry Point, North Carolina in 1941, and built six temporary airfields on the West Coast during the war.

Typical Navy temporary buildings were the H-shaped, two-story, wood-frame barracks; the arched laminated wood truss drill hall; and the arched metal Quonset hut. Originally designed for advance bases overseas in the Pacific Theater, the Quonset hut was a prefabricated portable building that a crew of eight men could assemble in one day.



Dirigible escort for U.S.S. Casablanca, 1943



Quonset Hut, Advance Base Depot, Davisville, R.I.



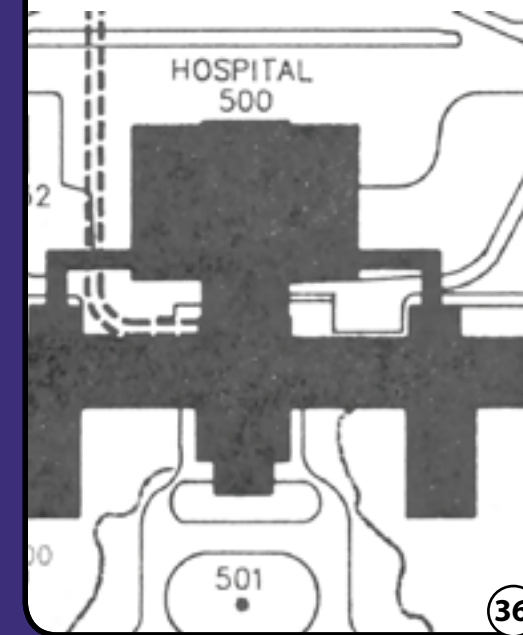
Fitzsimons Army Medical Center, Colo.



Airplane Hanger, Wright-Patterson Air Force Base, Ohio, 1943

1944-1945

- 1944 Battle of the Bulge begins on Dec. 16
- 1945 Iwo Jima surrenders to U.S. on March 16
- 1945 U.S. Marines land at Okinawa on April 1
- 1945 Army halts construction of 12 new tank plants on April 10
- 1945 Roosevelt dies on April 12. Vice Pres. Harry Truman becomes President
- 1945 United Nations Conference begins April 25. Results include signing of world security charter, agreement on international justice statutes, formation of United Nations
- 1945 Undersecretary of War declares 15 percent cutback in military orders on April 26
- 1945 Hitler commits suicide on April 30
- 1945 Berlin surrenders on May 2
- 1945 War Dept. announces two-million man discharge on May 5
- 1945 Germany surrenders unconditionally May 7. V-E Day celebrated on May 8
- 1945 Truman agrees on June 29 to invade Japanese home islands
- 1945 First atomic bomb detonated at Alamogordo, N.M. on July 16
- 1945 Army Air Force drops atomic bomb on Hiroshima on Aug. 6
- 1945 Soviet Union declares war against Japan on Aug. 8
- 1945 Army Air Force drops atomic bomb on Nagasaki on Aug. 9
- 1945 Japan surrenders unconditionally on Aug. 14
- 1945 Allies celebrate V-J Day on Aug. 15
- 1945 Army Procurement Program drops from \$29 billion to \$6.5 billion
- 1945 Japanese surrender documents signed on Sept. 2
- 1945 Nuremberg Trials for Nazi officials begin in November



Special Projects

Special projects included the construction of the Pentagon, the five-sided building that housed War Department Headquarters, and the Manhattan Project to develop the atomic bomb. The Pentagon was envisioned in summer 1941 as a consolidated headquarters for the War Department. The agency had outgrown its offices in the Munitions Building on Constitution Avenue in the District of Columbia, and personnel were scattered across the District in leased space. The new building was proposed originally to house 40,000 workers on a site in Arlington County, Virginia. Architect George E. Bergstrom based the design of the reinforced concrete, five-story building on original plans developed by the Chief of Construction Division under the U.S. Army Quartermaster General Brigadier General Brehon B. Somervell. The five-sided design was developed to accommodate this initial site, and was retained after President Franklin D. Roosevelt selected a new site three-quarters of a mile east. Construction began in fall 1941, and employed more than 13,000 workers. The War Department occupied the building by April 1942; construction was completed in January 1943 at a cost of \$2.2 million. The building occupies 29 acres on a 583-acre site. The Pentagon became the headquarters for the newly created Department of Defense in 1947. Today, it is one of the world's largest office buildings, housing approximately 23,000 employees dedicated to our country's defense. The Pentagon is a National Historic Landmark and is listed on the National Register of Historic Places.

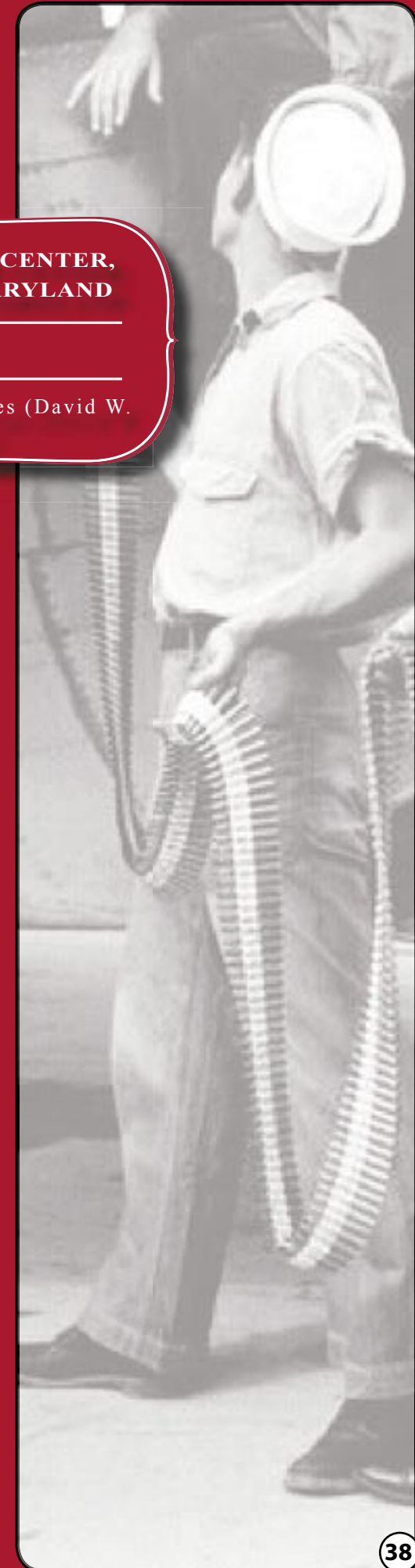
The Manhattan Project occupied three facilities built by the Army Corps of Engineers to develop the atomic bomb. The materials for the bomb were manufactured at enormous plants in Oak Ridge, Tennessee, and Hanford, Washington. Scientists working on the project were housed in Los Alamos, New Mexico. Other development work occurred at the University of Chicago, where the Metallurgical Laboratory isolated the first weighable amount of plutonium in August 1942, and where Italian physicist Enrico Fermi produced the first self-sustaining nuclear reaction in December 1942. Between 1943 and 1945, buildings designed for atomic research, development, and manufacturing were constructed at Oak Ridge and Hanford. Scientists, government employees, and dependents, which numbered more than 7,000 people, were housed at the former Los Alamos Ranch School for Boys. Led by Dr. J. Robert Oppenheimer, the scientists at Los Alamos conducted experiments and developed the first atomic bomb. On July 16, 1945, the world's first nuclear weapon was tested 210 miles south in Alamogordo, New Mexico on the Alamogordo Bombing Range. Today, the site is known as the Trinity Site and is located on the Army's White Sands Missile Range. The Trinity Site is a National Historic Landmark.



**NAVAL SURFACE WARFARE CENTER,
CARDEROCK DIVISION, MARYLAND**

Established 1939

National Register of Historic Places (David W.
Taylor Model Basin)





Personnel Support Facilities

The Army and Navy built hospitals to care for returning wounded soldiers and sailors. While the Surgeons General of the Army and the Navy wanted permanent hospital buildings constructed for sanitation and safety reasons, Army and Navy leaders used temporary construction whenever possible in order to save money and materials, and to ensure that buildings were erected as rapidly as possible. By the end of the war, the Army operated 65 general hospitals, and the Navy operated 50 hospitals. The typical hospital layout consisted of a series of one- or two-story wards linked by extensive corridor systems. The most impressive hospitals were those designed and under construction as the war began. These hospitals, including Fitzsimons Army Hospital, Brooke Army General Hospital, and Bethesda Naval Hospital, adopted the centralized, multi-story hospital design that followed the precedents of contemporary civilian hospital construction. After the war, few hospitals built during the war were retained by the Army and Navy. Some hospitals were transferred to the Veterans Administration, such as McGuire (Army) Hospital in Richmond, Virginia and the Naval Hospital in Dublin, Georgia.



Industrial and Support Facilities

The military invested in industrial construction to produce ammunition, explosives, and weapons that required specialized industrial facilities not readily available in the private sector. The War and Navy departments built complete industrial production plants and declared them military installations. Private contractors were hired to build and operate the plants. These Government-Owned, Contractor-Operated (GOCO) installations boosted production capacity.

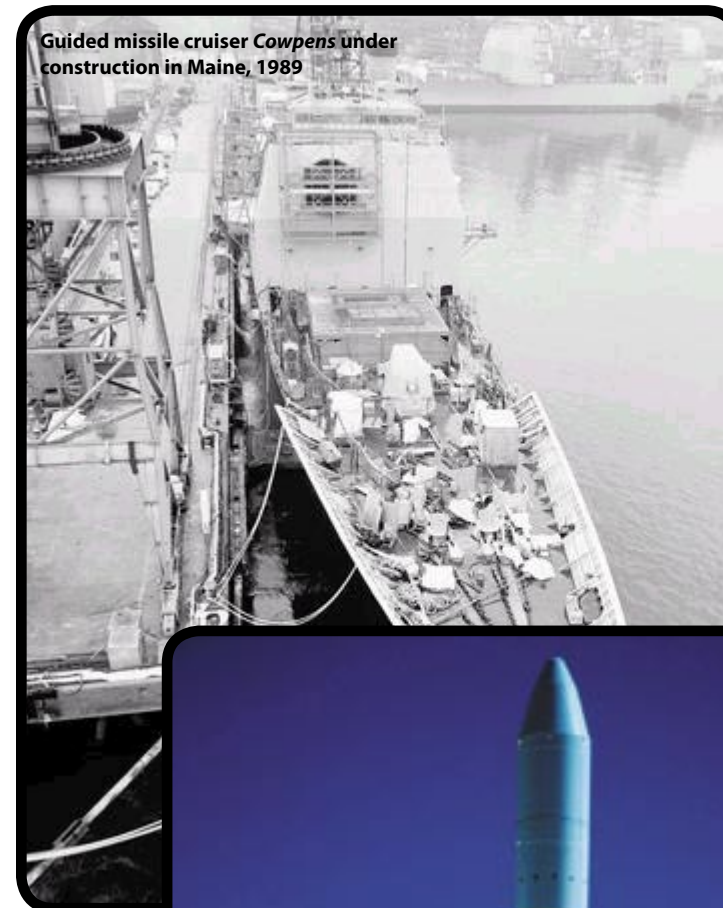
Both the War and Navy Departments built extensive depot systems to hold materiel for long-term storage, to serve the needs of military units in the United States, and to support the movement of materiel overseas. Depots served a variety of purposes, including storage of ammunition, general supplies, communications equipment, and engineering equipment. Each service developed a supply system of general depots for non-explosive, non-hazardous items, and of specialized depots that stored ammunition and explosives in acres of concrete igloos. Ports of embarkation were transshipment points for troops and supplies.

1946-1989 The Cold War Era

The Cold War era began in 1946, when the Soviet Union's intention to retain territory liberated from Nazi Germany during World War II became clear. It ended with the fall of the Berlin Wall in 1989. This era was marked by a tense, hostile relationship between the Warsaw Pact countries led by the U.S.S.R., and the North Atlantic Treaty Organization (NATO) countries led by the United States. In 1949, the Communists gained control over China at the end of a long civil war. Shocked by the rapid expansion of global communism, the United States assumed the lead role in preventing its further spread, especially in Asia. The Cold War era was characterized by a number of events: proliferation of nuclear weapons; a race to send astronauts into space and develop the technology to study it; sustained growth of U.S. military forces; repeated confrontations requiring diplomatic intervention; U.S. involvement in two major conflicts, in Korea and Vietnam; and occasional efforts to minimize tensions between the U.S.S.R. and the United States.

Following the end of World War II, the U.S. military was reduced drastically in size. Soldiers and sailors wanted to return to civilian life. The number of military personnel decreased from more than 10.7 million in 1945 to approximately 1.3 million in 1947. Training camps and ammunition production facilities were closed or placed on standby status. The Navy mothballed approximately 2,600 ships, while retaining 319 major combatant and 724 auxiliary ships. However, although the overall number of military personnel decreased, the U.S. military maintained the highest personnel levels during the Cold War era than at any other time of peace in U.S. history, more than 2 million personnel in all services during the 1950s and 1960s.

The National Security Act of 1947 resulted in a major reorganization of the U.S. military. The act established the Department of Defense with three separate departments: Army, Navy, and Air Force. Coastal artillery and coastal fortifications were abandoned, and the primary task of defending U.S. borders was assigned to the Air Force and the Navy. The Air Force was charged with defending the borders of the United States and with gaining and maintaining air supremacy. The Air Force was the only service at the time that could deliver nuclear weapons through strategic bombing, and the threat of nuclear retaliation was held to be an effective deterrent to attack. The Navy, which ended World War II with complete control over the oceans, restructured its forces to use aircraft carriers as the basis for a fleet that could overpower all opponents. The Army was charged with maintaining ground force readiness as an alternative to strategic nuclear weapons for deterring Communist expansion.



Guided missile cruiser *Cowpens* under construction in Maine, 1989



Titan IV-B missile launch

1945-1990

- 1946** United Nations General Assembly meets in January
- 1946** Trials of major Japanese war criminals begin in May
- 1946** Peace conference in Paris begins July 16 and runs through Oct. 15
- 1946** U.S. tests nuclear weapons on Bikini Atoll
- 1947** National Security Act keeps Navy Department, changes War Department to Army Department., establishes Air Force, unites services under Defense Secretary
- 1948** Truman instructs military services to racially integrate
- 1948** Berlin Airlift supplies West Berlin, blockaded by Soviet Union
- 1949** Soviets test nuclear weapon
- 1950** U.S. sends advisors to Vietnam to aid French against nationalist group Viet Minh
- 1950** Communist forces invade South Korea June 25
- 1953** Korea cease-fire armistice signed July 27
- 1954** First Nike missile deployed
- 1954** Navy commissions first nuclear-powered warship, the *Nautilus*
- 1961** Berlin Wall built on Aug. 13
- 1962** Cuban Missile Crisis
- 1964** Tonkin Gulf Resolution authorizes more troops for Vietnam
- 1968** Tet Offensive on Jan. 30 increases public opposition to Vietnam conflict
- 1973** Military draft lapses and armed forces become All-Volunteer Force July 1
- 1975** Marines evacuate Saigon and Cambodia, ending U.S. involvement in Vietnam
- 1982** Continuing communism containment, Marines sent to Lebanon
- 1983** More than 200 Marines die when Beirut headquarters bombed
- 1983** U.S. troops invade Grenada to protect U.S. citizens from Cuban troops
- 1989** Berlin Wall falls on Nov. 9
- 1990** Berlin Wall removed



Military Construction

Military construction during the Cold War era accommodated numerous technological advances in the quest to defend the United States. As each service developed new equipment and weapons systems, new types of facilities were needed, including new research and development laboratories, testing and evaluation facilities, training and education facilities, and logistical and operational support facilities. Some of the major technological advances that increased U.S. military effectiveness included guided missiles, jet aircraft, helicopters, aircraft supercarriers, submarines, tanks, chemical and biological agents, and communications systems.

U.S. Air Force

The Air Force, the newest department in the Department of Defense, required the greatest amount of new construction. The Air Force inherited all the airfields operated by the Army Air Corps since World War I, but needed additional bases and expanded facilities to support its new strategic and tactical missions and modern equipment. The advent of new aircraft, especially bombers and jets, required new facilities. Runways had to be longer, wider, and stronger to support faster and heavier bombers and transport aircraft. Support facilities included larger hangars, taller control towers, and fuel storage and dispensing stations. The Air Force was assigned to develop strategic, long-range guided missiles, called Intercontinental Ballistic Missiles (ICBMs), which required enormous amounts of research dollars to develop and deploy. Titan missile silos were a new type of facility constructed in strategic areas to launch these missiles.

U.S. Navy

The Navy focused on maintaining U.S. superiority on the oceans. During the 1950s, fleet improvements included new, larger aircraft carriers that supported armed jet aircraft to use against an enemy fleet or to support land operations. In 1955, the Navy launched the first supercarrier, the *U.S.S. Forrestal*, which weighed 60,000 tons, twice the weight of World War II carriers. The carrier supported more than 100 aircraft, including fighters, fighter-bombers, early warning radar aircraft, and helicopters. During the 1950s, three other supercarriers were constructed, including the first nuclear-powered carrier. Submarines also were improved. The *U.S.S. Nautilus*, the first nuclear-powered submarine, was launched in 1954. The new class of submarines also carried ballistic missiles. The Polaris missile was tested successfully in 1960. It was followed by Aegis cruise missiles and Trident ballistic missiles in the 1980s.

Satellite launch, 1980



Wherry Act Family Housing, Fort Bragg, N.C.



U.S. Army

During the Cold War, the Army served as the ground component of the conventional force that complemented strategic nuclear weapons. The Army developed new strategic roles for conventional forces in the battlefield, emphasizing force readiness, rapid deployment, and flexibility on the battlefield. The Army developed tactical nuclear weapons and ground-to-air and ground-to-ground guided missiles. Helicopters supported rapid troop movements across the battlefield. During the early Cold War years, the Army was charged with air defense of the United States, and it developed and deployed the Nike Ajax and Nike Hercules missile batteries to protect major U.S. cities. By the late 1950s, the Army began work on an antiballistic missile (ABM) system. After the end of the conflict in Vietnam, the Army embarked on a major period of materiel modernization. This materiel development process kept pace with the ever-increasing complexity of modern weapons and military technology, keeping the U.S. Army the best equipped and best trained fighting force in the world.

Air Force Academy cadet chapel, Colorado



AIR FORCE ACADEMY, COLORADO

Established 1954
Burgess family log home (ca. 1871)

National Register of Historic Places
National Historic Landmark

U.S.S. NAUTILUS, CONNECTICUT

Commissioned 1954
First ship to cross the North Pole (1958)
Decommissioned 1980

National Register of Historic Places
National Historic Landmark



Housing

The increased levels of military personnel in all services caused a critical housing shortage, especially for enlisted personnel. As the requirements for defending the country relied on more sophisticated technologies that required intensively trained personnel, the Department of Defense faced the challenge of retaining qualified personnel. Providing housing for unmarried and married enlisted personnel became a key objective so that the military could compete with the civilian employment market to maintain an effective fighting force. This objective remained critical after the all-volunteer military was instituted in 1973.

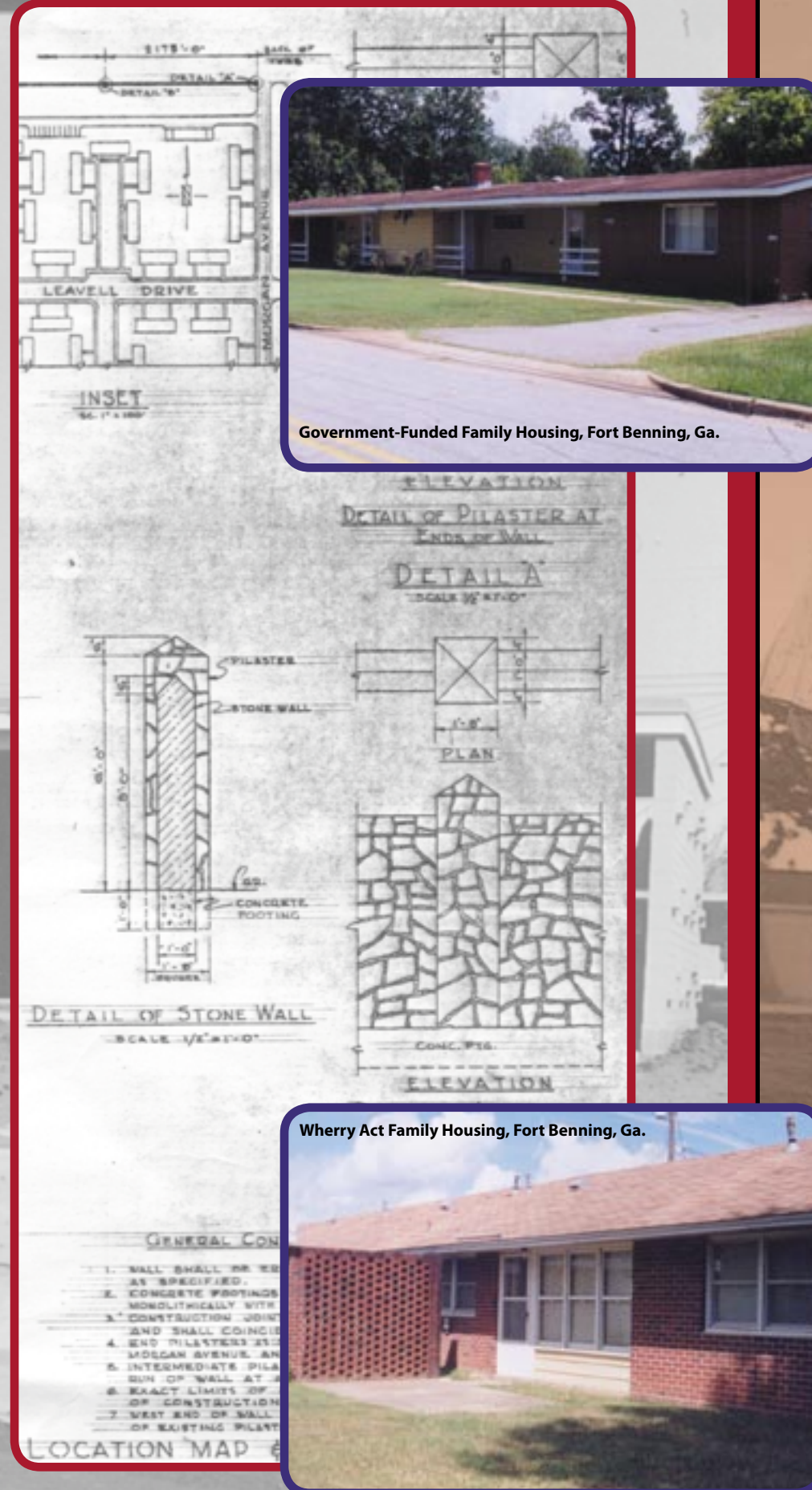
Army barracks typically accommodated all company functions in one building. The standard Army barracks design incorporated troop housing, dining facilities, and administration in one building. Troop housing was traditionally in open dormitories. After the advent of the all-volunteer military in 1973, the barracks design was changed to allow more individual privacy in living arrangements.

The higher number of married personnel with children, especially among the enlisted, was another major change reflected in military construction during the Cold War era. Prior to World War II, the Army's housing inventory included an estimated 15,000 family quarters, primarily for officers and non-commissioned officers; the Navy had many fewer units. At the beginning of the Cold War era, the military estimated a shortfall of 235,000 units of family housing. The shortfall could not be made up by annual military appropriations, especially in light of the uncertain future of many military installations and the number of World War II temporary buildings needing replacement.

The Wherry and Capehart Acts

The Wherry and Capehart acts, augmented by annual military construction appropriations, were the vehicles for addressing the family housing shortage. The Wherry and Capehart acts forged public-private partnerships in which civilian architects and developers built the housing by taking advantage of financial incentives extended through the Federal Housing Authority. Under the Wherry program, which spanned 1949 to 1956, the developer retained ownership of the housing and managed it. Under the Capehart program, which lasted from 1955 to 1962, the military assumed ownership of the housing units. By 1960, an estimated 83,740 units under the Wherry program and an estimated 107,280 units under the Capehart program had been authorized for construction.

Family housing constructed between 1949 and 1962 reflected trends in civilian suburban neighborhoods. Civilian building technology and modern construction materials were used in military housing. The Wherry and Capehart neighborhoods were designed with such elements as curvilinear streets comparable to civilian suburbs. During the later years of the Cold War, additional amenities, such as playgrounds, were included in the neighborhoods.



Government-Funded Family Housing, Fort Benning, Ga.

Wherry Act Family Housing, Fort Benning, Ga.

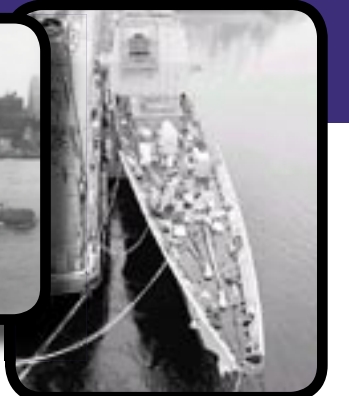




The buildings and facilities of the American military reflect the development of the nation as a whole. In war and peace, the foundations of our military heritage have been built to address the demands of technology, training, and the political situation. Technology always has been a major impetus for military construction, whether it was shipyard improvements to implement the shift from wooden- to steel-hulled ships, or entirely new installations to take advantage of the new world of aviation. Each advance in technology required research and testing facilities, to ensure that military equipment, weapons, and ammunition were the best they could be. As the military matured and became more complex, it required places such as the service academies and recruit depots to prepare new generations of officers and enlisted personnel to defend the nation's interests. From the Revolutionary War to the Cold War, military construction also has responded to the needs of the current political situation. During the Revolutionary War, the colonial government built coastal forts, barracks, and camps to house soldiers and defend the colonies. Coastal and frontier forts and shipyards supported the new country's defense and expansion as European powers relinquished control of western

lands. Rustic posts built across the frontier housed soldiers and protected settlers as the Army and Native Americans clashed for control of western territory during the nineteenth century. Shipyard improvements raised the Navy to the status of other world powers in the early twentieth century. During World War I, temporary Army camps and buildings at Navy training stations rose to house and train thousands of recruits. The United States home front during World War II was transformed into an "arsenal of democracy" to manufacture weapons, ammunition, and supplies for the war effort. To satisfy its mission to contain Communism during the Cold War, the military built research and development laboratories, testing and evaluation facilities, training and education facilities, and logistical and operational support facilities.

Although the circumstances have changed, military construction always has served these purposes. Historic properties illustrate that today's armed forces face some of the same challenges that faced George Washington and his troops. These properties are assets that help us understand the evolution of the nation's military history. Historic buildings, structures, and objects on Army, Navy, Marine Corps, and Air Force installations are part of our national military legacy. They celebrate the rich history of the nation's military forces.



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