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

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.
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.
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.

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 iniability and wars 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 1820, the Navy Department had acquired six shipyards. Four more yards were established by 1833. 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.
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.
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
- Civil War starts with Confederate attack on Ft. Sumter, S.C., first American conflict to mobilize many troops
- First military wartime use of balloons to monitor troop movements
- Army Balloon Corps formed, abandoned in 1863
- First naval battle, at Pensacola shipyard, Fla. Confederates win, Union retakes in 1862
- Rock Island Arsenal, Ill., built as one of three Midwest storage and repair depots
- 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
- African Americans authorized to serve in Union Army
- U.S. Army Signal Corps established
- Draft Act of 1863 goes into effect
- Arlington National Cemetery established
- Union Quartermaster Corps creates standardized barracks plans
- New rifled artillery penetrates masonry coastal defenses, making them obsolete
- Army Engineer School moves from West Point to Ft. Totten, N.Y.
- Alaska Territory purchased from Russia
- Torpedo School established at Newport, R.I.
- Quartermaster Gen. Montgomery Meigs begins index of buildings at military posts
- Signal Corps begins observing weather and signaling storm warnings
- Quartermaster Gen. Montgomery Meigs creates plans for barracks, officer’s quarters and other buildings to standardize Army construction
- Sioux defeat Gen. George A. Custer at Battle of Little Bighorn, last Indian victory
- Electric lights installed aboard a vessel, the Jeannette
- War Dept. begins upgrading living conditions and consolidating Army posts
- Navy phases out wooden ships, builds three steel cruisers
- Systematic training of Navy recruits begins at Newport, R.I.
- Naval War College established at Newport
- Endicott Board recommends new type of coastal artillery battery for strategic coastal locations
- Army Hospital Corps organized
- First Army gun factory built at Watervliet Arsenal, N.Y.

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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.
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. Housatonica 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.
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.
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.
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.
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.
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
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.
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 Chautauqua 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.
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 Protection 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.
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 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.
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 $22 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.
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.

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.
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.
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. Army

The Army, the newest department in the Department of Defense, required the greatest amount of new construction. The Army 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.

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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.

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.

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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.
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.
We … got ourselves cleverly settled for the night…'
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