

ALBROOK AIR FORCE STATION
East Bank of Pacific Entrance to Panama Canal
Balboa Vicinity
Former Panama Canal Zone
Republic of Panama

HABS No. CZ-10

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN BUILDINGS SURVEY

Rocky Mountain Regional Office

National Park Service

Department of the Interior

12795 W. Alameda Parkway

Denver, Colorado 80225

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HISTORIC AMERICAN BUILDINGS SURVEY

ALBROOK AIR FORCE STATION

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For information about other structures at the Albrook Air Force Station site, see:

- HABS No. CZ-10-A, Albrook Air Force Station, Field Officer's Quarters
- HABS No. CZ-10-B, Albrook Air Force Station, Company Officer's Quarters
- HABS No. CZ-10-C, Albrook Air Force Station, Non-Commissioned Officers' Duplex
- HABS No. CZ-10-D, Albrook Air Force Station, Parachute & Armament Building
- HABS No. CZ-10-E, Albrook Air Force Station, Dispensary

- Location: East Bank of Pacific entrance to Panama Canal, Balboa Vicinity, former Panama Canal Zone, Republic of Panama, Central America
- Present Owner: United States Department of Defense
- Original Use: U.S. Army Airfield
- Present Use: U.S. Air Force Housing, Administration, and Support; U.S. Army Air Operations and Support
- Significance: Albrook Air Force Station is significant as the first U.S. military airfield on the Pacific side of the Panama Canal. Early on, its airstrips served PanAm commercial flights and thus the installation also had an impact on the emerging Latin American commercial air travel routes. Albrook was home to the Inter-American Air Forces Academy and was also the U.S. Air Force Headquarters in Panama up until the time of Treaty implementation. In addition to the ubiquitous white stuccoed concrete and red clay tile construction, the buildings at Albrook include some highly stylized examples, including Mission, Art Deco, and International Style architecture.

PART 1. HISTORICAL INFORMATION

A. Physical History:

1. Original Construction Date: Initial construction began in 1930 and was completed by 1932.
2. Planner: U.S. War Department
3. Original and Subsequent Owners: U.S. War Department, U.S. Department of Defense
4. Builders, Contractors and Suppliers: Panama Canal Department (hydraulic fill operations); J.A. Jones Construction Company of Charlotte, NC (barracks, quarters, utilities, and hangar and shop foundations); J.W. Patience (hangars and shops); and Tucker T. McClure of Los Angeles, CA and Colon, Canal Zone (aprons, roads, and ramps)
5. Alterations and Additions: Albrook Air Force Station has evolved over the years, growing primarily through the expansion preparatory to World War II. The main elements of this construction program were additional housing, improvements to the airfield, and creation of the Panama Air Depot (PAD). The base expanded geographically with new housing pushing out to the north, and the air depot opening up a new development area to the south across the runway. With the implementation of the Panama Canal Treaties, 01 October 1979, the PAD area was transferred to the Republic of Panama.

B. Historical Context:

Early Explorations of Water and Land Routes

While the Panama Canal and the surrounding Canal Zone are most frequently associated with the United States, interest in building or discovering a waterway to connect the Atlantic and Pacific Oceans at the Isthmus of Panama began centuries ago. Christopher Columbus searched for such a waterway in his final voyage, as did Vasco Nunez de Balboa, who discovered the Pacific Ocean in 1513, and Mexican explorer Hernando Cortez in the 1520s, before the development of projects for artificial passages through the Isthmus had begun.¹

¹ Hugh Gordon Miller, The Isthmian Highway: A Review of the Problems of the Caribbean, (New York: MacMillan Co., 1929), 7; John O. Collins, The Panama Guide, (Mount Hope, CZ: I.C.C. Press, 1912), 57.

In 1533 the Chagres River was made navigable to within twenty miles of Panama City at Venta de Cruces, which means "the crossing." The eighteen-mile Las Cruces Trail provided access the rest of the way to the Pacific.²

King Charles V of Spain took the first official step towards construction of a canal in 1534, when he had a survey made of the land from the end of the Chagres River to the Pacific, which is the route of the Panama Canal today. In 1534, however, Pascual de Andagoya, the commissioner who made the survey, said there were too many obstacles for even the vast resources of the powerful king to consider building a canal.³

During this time Spain conquered Peru, and Charles V needed to transfer gold and other precious valuable metals through the Isthmus. The Las Cruces Trail became the most popular route. Much of this trail was built over swamps and had to be filled in with rocks carried several miles. When the trail was finished, it was wide enough to accommodate two carts. The Spaniards sent boats down the Atlantic and into the Chagres as far as Cruces where the trail crossed the river. There they would receive the riches brought in carts, on pack mules, or by slaves, and take it back to the Atlantic harbor at Nombre de Dios.

In 1536, a trading post, wharf, and warehouse were built at Venta de Cruces. Cruces became the largest and most important village in the Isthmus interior. Throughout the sixteenth century, transit was often halted by cimarrones (runaway Negro slaves). To protect traffic on the Chagres, Spain built Fort San Lorenzo at the river's mouth, a fortress at the entrance to the Nombre de Dios harbor, and a fortification at Venta de Cruces by 1597. The Las Cruces Trail was paved by 1630, and Spain continued to grow richer and more powerful in the New World. Panama became the crossing place for trade routes from China, Japan, and India as well as South America.⁴

Spain and Britain Fight for Isthmian Control

Despite the negative reports of the 1534 survey, Charles V was still interested in building a canal. There were four major routes under consideration -- Panama, Nicaragua, Darien (southeast of

² John and Mavis Biesanz, The People of Panama, (New York: Columbia University Press, 1955), 25; Miller, The Isthmian Highway, 7; Collins, The Panama Guide, 57.

³ Miller, The Isthmian Highway, 7; Collins, The Panama Guide, 57; Miles P. DuVal, Cadiz to Cathay: The Story of the Long Struggle for a Waterway Across the American Isthmus, (Stanford, CA: Stanford University Press, 1940), 6.

⁴ Susie Pearl Core, Trails of Progress, or the Story of Panama and its Canal (New York: Knickerbocker Press, 1925), 24-26; Gerstle Mack, The Land Divided: A History of the Panama Canal and Other Isthmian Canal Projects, (New York: Alfred A. Knopf, 1944), 53-55; U.S. Department of State, Final Environmental Impact Statement for the New Panama Canal Treaties, (Washington, D.C.: GPO, December 1977), Appendix, G.14.

Panama), and Tehuantepec (Mexico). Spanish historian Francisco Lopez de Gomara supported his king, and wrote in 1552 that any of the four sites would be beneficial to supplying a trade route to the Indies. Portuguese navigator Antonio Galvao also published a book expressing his interest in digging a canal at any of the four sites.⁵

Charles V abdicated the throne in 1555. His son and successor, Philip II, was opposed to the idea of a canal. Although he did order a survey in 1567 to consider the possibility of a canal through Nicaragua, via the San Juan River and Lake Nicaragua, the report was as unfavorable as the Panama survey, and plans for a canal were abandoned. Philip believed the Isthmus served as protection for Spanish shipping on the Pacific. The opening of a canal would encourage other countries to compete for its possession. Philip increased the tolls through the Isthmus, and it became the only legal means of transit for goods from Argentina and the Philippines. Although Spain temporarily had to use Nicaragua when English explorer Francis Drake invaded the Pacific in 1579 and interfered with the Panama route, Philip maintained this policy until his death in 1598, even saying that a canal would directly violate the laws of God, who had created the Isthmus as it was. Although his successor, Philip III, considered a canal route via the Gulf of Darien and the Atrato River in 1616, the idea was quickly abandoned, and the policy of Philip II was firmly entrenched in Spain for the next two hundred years.⁶

British explorers and pirates continued to raid Spanish ships and territories in the 1600s, for mahogany wood as well as gold and silver. Oliver Cromwell conquered Jamaica in 1655. Edward Hume led an expedition across the San Juan River and Lake Nicaragua and took Fort San Carlos and the city of Leon. Here the British first realized the significance of Lake Nicaragua as a potential canal route, and sought to gain control of it. When Spain began counterattacks in that area, Britain moved south again. In 1671, Sir Henry Morgan conquered Porto Bello, which had replaced Nombre de Dios as the main Atlantic port, and also destroyed the Pacific coast city of Panama. To temporarily prevent further aggression, the countries negotiated a treaty which included an article giving the King of England a right to retain forever "any part of America" then in possession of his subjects. This greatly increased Britain's log-cutting trade in Central America, and gained them an alliance with the Miskito Indians, who had been treated cruelly by the Spanish. The area where this tribe was located, between the San Juan River and Cape Honduras, became known as the Mosquito Coast.⁷

⁵ DuVal, Cadiz to Cathay, 6-7.

⁶ DuVal, Cadiz to Cathay, 7-8; Miller, The Isthmian Highway, 8; Core, Trails of Progress, 28, 82; Collins, The Panama Guide, 109; Biesanz, People of Panama, 28-29.

⁷ Mary W. Williams, Anglo-American Isthmian Diplomacy, 1815-1915, (Washington, DC: American Historical Association, 1916), 4; DuVal, Cadiz to Cathay, 9, 12-13; Biesanz, People of Panama, 29-31.

Initial Interest from America and France

Panama was in a state of decline in the eighteenth century. Although the city of Panama was rebuilt, it ceased to be the main trade route for Spanish treasure. Heavy taxes prevented trade with other colonies and discouraged industry and agriculture. Attacks from runaway slaves continued, and many colonists left for better climates. France made its initial survey of a potential canal in 1735, sending astronomer Charles Maire de la Condamine on a scientific expedition to Quito. Returning to France in 1740, Condamine said a canal at Nicaragua would be practical, but nothing was done.⁸

In the Treaty of 1763, Britain agreed to abolish its fortifications in the Honduras Bay area and most of the Spanish territories of Central America. However, with the help of the Indians, who had never been conquered by Spain, the British continued to control the Mosquito Coast, including the mouth of the San Juan River. British hostility in Central America caused Spain to help the colonists in the Revolutionary War, while continuing to fight for the Mosquito area. Under Captain Horatio Nelson, the British set sail from Jamaica and reached the San Juan River on 24 March 1780. They captured several Spanish outposts before tropical rains, fevers, and diseases took their toll on the men. After Britain was defeated in the American Revolution, Spain was determined to drive them out of the Mosquito Coast. On 14 July 1786, in a treaty signed at London, Britain agreed to get out of the Mosquito Coast. They kept their woodcutting area in Belize, but were not to engage in other businesses; however, they secretly continued to conduct business with the Miskitos.

American interest in the canal dates back to 1779, when diplomat Benjamin Franklin, while in France, received a letter from French peasant Pierre-Andre Gargaz, who was in prison at the time, asking Franklin to read his manuscript on building canals at Panama and Suez. The canals would reduce the global circumnavigation time from three years to ten months, and establish beneficial trade and money circulation between many different nations. Franklin was so impressed with the manuscript, entitled "A Project for Universal Peace," that when Gargaz was released from prison in 1781, Franklin printed and provided him with a desired number of copies for distribution in France. Thomas Jefferson, who succeeded Franklin as U.S. Minister in Paris, also read Gargaz's manuscript, along with other sources on canal plans. He wrote two letters to Spanish Minister William Carmichael in 1787 and 1788 expressing his interest in obtaining copies of the surveys and reports made on the Isthmus.⁹

⁸ Biesanz, People of Panama, 32-33; DuVal, Cadiz to Cathay, 12.

⁹ DuVal, Cadiz to Cathay, 13-19.

Revival Under Humboldt

Fresh new interest in the canal was revived early in the nineteenth century by German explorer Alexander von Humboldt. Humboldt explored Spanish America from Peru to Mexico in the years 1799 to 1804. In his Political Essay on the Kingdom of New Spain, published in 1808, he criticized the Panama route, though he never saw it, because of its high mountains, and said that Nicaragua, with its vast water supply, would be the best route. At the end of his travels, Humboldt likely discussed the canal with President Jefferson, whom he visited at the White House in 1804. His trip coincided with the journey of Lewis and Clark, whom Jefferson ordered to seek a northwest passage to the Pacific, a route Humboldt also strongly endorsed.

Spain's final chance for a canal came in 1814 when the government endorsed the Nicaraguan route and the formation of a company to start work. However, revolutionary movements by its colonies ended Spanish hopes for a canal. Spanish interest in the Isthmus ended in 1821 when Central America declared its independence. The Isthmian area united with Gran Colombia (later New Granada), led by president Simon Bolivar.¹⁰

Gran Colombia was interested in building a canal, and proposed Nicaragua and Panama projects with the U.S. in 1825 and 1826. Aaron Palmer of New York agreed to build a canal, but could not get the necessary funding. Bolivar tried to do the project himself, with assistance from French, British, and English engineers, but was unsuccessful. Gran Colombia disbanded in 1831, with New Granada retaining the rights to Panama. The Dutch failed in their only attempt to build a canal at this time as well.

American John Lloyd Stephens passed through Nicaragua in 1840 while exploring Mexico, and said Nicaragua would be the perfect place to build a canal, with a cost of \$25 million. He called it "an enchanting land of blue lakes and trade winds, towering volcanic mountains, rolling green savannas and grazing cattle."¹¹

France became interested in the Panama route by way of the Chagres River in 1838, when New Granada granted the French firm of Augustin Salomon a contract to construct a road or canal across the Isthmus. Humboldt even wrote to Salomon in 1842, expressing his disappointment that a route had still not been firmly established. French engineer Napoleon Garella was sent to Panama for further study in 1843, and recommended an entrance at Limon Bay, again with a cost

¹⁰ David McCullough, The Path Between the Seas: The Creation of the Panama Canal, 1870-1914, (New York: Simon and Schuster, 1977), 28-30; Stephen Wolff Frenkel, Cultural Imperialism and the Development of the Panama Canal Zone, 1912-1960, (Ann Arbor, Michigan: UMI Dissertation Services, 1995), 94; DuVal, Cadiz to Cathay, 21-23.

¹¹ McCullough, Path Between the Seas, 32.

of \$25 million. While the survey was positive, the cost was too high, and New Granada canceled the contract. Mexico's government made investigations for the Tehuantepec route in 1824 and 1842, using combinations of a canal, carriage road, or railroad. But these plans failed, like all the others in the early half of the nineteenth century, either through lack of money, or lack of foresight by people in charge of the surveys.¹²

Gold and the Panama Railroad

The U.S. took the next initiative in the battle for the Isthmus under the administration of President James Polk. Polk's Minister to Central America, Benjamin Bidlack, negotiated a treaty on his own in 1846, in which New Granada guaranteed the U.S. exclusive right of transit across the Isthmus in exchange for New Granada's right of sovereignty there. The treaty was finally ratified in 1848.

Another incident occurred in 1848 that drastically changed the course of Panamanian as well as American history. Gold was discovered in California, and by 1849, thousands of men were crossing the Isthmus every year to seek their fortune. They found boiling heat and blinding rain. The Chagres was filled with heavy green slime, and the Las Cruces Trail was covered with mud. Huts were infested with bugs. Fever, cholera, and dysentery were common. Despite this, many were thrilled with the spectacle of the jungle and the brilliant green mountains. The distance saved by traveling from New York to San Francisco using the Isthmus instead of Cape Horn was eight thousand miles.¹³

The U.S. Congress selected a committee to travel to the Isthmus in 1849. They recommended construction of a railroad, with eventual plans for a canal. On 12 June, the Panama Railroad Company was founded under the direction of John Lloyd Stephens (who had earlier traveled to Nicaragua), William Henry Aspinwall, and Henry Chauncey. Construction began in 1850, and was finished in 1855 at a cost of \$8 million, six times higher than estimated. Almost six thousand workers died, including Stephens in 1852. But the first transcontinental railroad, at forty-seven and a half miles long, was an instant financial windfall. Profits in the first six years of operation exceeded \$7 million. At \$295 a share, the Panama Railroad was the highest-priced stock on the New York Exchange. Over 400,000 people used the railroad in the first ten years.¹⁴

The United States and England nearly went to war over the Nicaragua route. In 1848, Britain took San Juan Del Norte, at the mouth of the San Juan River, renaming it Greytown. The U.S. considered this a violation of the 1823 Monroe Doctrine, which considered any European

¹² McCullough, Path Between the Seas, 30-32; DuVal, Cadiz to Cathay, 23-33.

¹³ McCullough, Path Between the Seas, 34.

¹⁴ McCullough, Path Between the Seas, 33-37; DuVal, Cadiz to Cathay, 35-39.

expansion in the Western Hemisphere a threat to American safety and security. An 1850 treaty binding the two countries to joint control of any canal built in Central America averted the crisis. The Clayton-Bulwar Treaty was named after U.S. Secretary of State John Clayton and British envoy Sir Henry Lytton Bulwar.¹⁵

U.S. Progress Towards a Canal

The U.S. Senate on 19 March 1866 resolved the Secretary of the Navy to supply a study of all practical lines of ship canals over the Isthmus. Rear Admiral C.H. Davis reported that Darien was the site to be pursued. In 1869, General Ulysses Grant became President. He had traveled the Isthmus in 1852 while in the Army, and realized its value. Beginning with Navy Commander Thomas O. Selfridge, who led a survey to Darien, Grant ordered seven Central American expeditions between 1870 and 1875. In 1872, Grant appointed the first U.S. Isthmian Canal Commission, which recommended Nicaragua as the ideal route in 1876. Grant's successor, Rutherford B. Hayes, in an 8 March 1990 speech to Congress, declared "The policy of this country is a canal under American control. The United States cannot consent to the surrender of this control to any European power...."¹⁶

On 15 December 1884, Navy Secretary William E. Chandler ordered A.G. Menocal to survey Nicaragua. Menocal recommended a total of seven locks and a 169 mile canal. In 1887, the Nicaraguan government gave the Nicaragua Canal Commission of New York a concession to begin canal excavation. Two years later, the U.S. Congress incorporated the group with the Maritime Canal Company of Nicaragua. Construction began at Greytown on 8 June 1890. Despite initial success, funds were exhausted in three years, and the project was terminated.

Under Ferdinand de Lesseps, who played a large role in building the Suez Canal in 1869, France had begun building a canal at Panama in 1881. This project would fail by 1889, when the U.S. Senate passed a resolution that would look with disapproval on any European government trying to construct a canal across Central America.

With France out of the picture, Congress and President William McKinley continued investigating canal possibilities in Panama and Nicaragua. They also were involved in a diplomatic dispute with Great Britain over Isthmian territory. Secretary of State John Hay and British Ambassador Sir Julian Pauceforte signed a treaty in 1900 that gave the U.S. the right to construct, own, and operate, but not fortify, a canal. Rejected by Congress, Hay was forced to

¹⁵ McCullough, *Path Between the Seas*, 38; DuVal, *Cadiz to Cathay*, 61-62, 460-464.

¹⁶ McCullough, *Path Between the Seas*, 19-20, 27; DuVal, *Cadiz to Cathay*, 71-75, 78-80; U.S. Senate, *A Chronology of Events Relating to the Panama Canal: Prepared for the Committee on Foreign Relations*, (Washington, D.C.: GPO, December 1977), 2, hereafter cited as U.S. Senate, *Chronology*.

renegotiate the treaty. On 18 November 1901, a new Hay-Paueforte Treaty was signed, which removed the constraints of the Clayton-Bulwar Treaty of 1850, and gave the U.S. full authority to defend and govern a canal.¹⁷

Roosevelt and the Panamanian Revolution

In September 1901 McKinley was assassinated, and Theodore Roosevelt became President. To Roosevelt, the canal was indispensable, a vital path to the global destiny of the U.S. for the twentieth century. He saw the canal linking American commanding power on the Atlantic and Pacific Oceans. During the first Hay-Paueforte negotiations, while still Governor of New York, Roosevelt wrote to Hay expressing his concern that the treaty did not give the U.S. fortification rights, and that it violated the Monroe Doctrine. While the Isthmian Canal Commission recommended the Nicaragua route in November 1901, the French New Panama Canal company agreed to sell its assets for \$40 million, and the Commission changed its support to Panama two months later. In 1903, the U.S. signed the Hay-Herran Treaty, negotiated between Hay and Dr. Tomas Herran, Colombian Minister to the U.S., that would have granted the U.S. a 100-year lease on a zone of land ten miles wide to build a Panama Canal. But this treaty was rejected by the Colombian Senate, because it threatened Colombian sovereignty.¹⁸

Another way to ensure construction of the canal would be the establishment of an independent Panama. Dr. Manuel Amador Guerro and several associates were involved in plotting the course of a Panamanian Revolution. Amador had been elected President of the State of Panama in 1867, then was a doctor at the Santo Tomas Hospital in Panama City and for the Panama Railroad Company. He witnessed a number of revolutionary attempts in Colombia in the late 1800s, and perceived that Panama was ready to seek independence. French engineer Philippe Bunau-Varilla worked under de Lesseps and was a division leader in the French canal plan in the 1880s. He made it his lifelong goal to build a sea-level canal at Panama. By the early years of the new century, he was actively involved in Washington, DC diplomatic circles and was advocating an independent Panama.

On 3 November 1903, Panama declared its independence from Colombia. The American ship Nashville, along with United States forces on both sides of the Isthmus, acted to protect the Panama Railroad according to the 1846 Mallarino-Bidlack Treaty. Colombian troops at Colon were therefore prevented from reaching Panama City. With no intervention by Colombian

¹⁷ DuVal, Cadiz to Cathay, 83-85, 102, 107, 110-121, 465-467; McCullough, Path Between the Seas, 52-53, 131, 256-259; U.S. Senate, Chronology, 2; Logan Marshall, The Story of the Panama Canal, (New York: L.T. Myers, 1913), 202.

¹⁸ DuVal, Cadiz to Cathay, 116, 119-121, 148, 174-175, 468-481; McCullough, Path Between the Seas, 246-247, 250, 257, 269; U.S. Senate, Chronology, 2-3.

troops, the revolution succeeded and three days later the United States formally recognized the new republic. On 18 November, the Hay-Bunau-Varilla Treaty granted the United States "in perpetuity the use, occupation, and control" of a ten-mile wide area of land across the Isthmus to construct and defend a canal, with "all the rights, power and authority within the zone...which the United States would possess and exercise if it were the sovereign of the territory."¹⁹ The United States agreed to pay Panama \$10 million in compensation, and an annuity of \$250,000 per year after canal completion. No Panamanian signed this treaty.

After the Senate ratified the treaty in February 1904, Bunau-Varilla resigned as Minister Plenipotentiary to Panama and returned to France. For him, the treaty was especially gratifying. Along with Ohio Senator Mark Hanna, he had been the strongest advocate of the Panama route. Panama would be 134.5 miles shorter than Nicaragua; it would take less time, twelve hours to thirty-three, to pass through. It had better harbors, would require fewer locks, and would cost less. The majority of engineers supported Panama. There were also concerns about the presence of volcanos near the Nicaraguan route. These concerns finalized the decision to build at Panama in June 1902, which was further solidified by the Revolution.²⁰

Building the Canal

The French property on the Isthmus was officially turned over to the United States on 4 May 1904. The cities of Colon and Panama were in the Republic, but outside the Canal Zone. Rear Admiral John G. Walker, a retired Naval officer, was made chairman of the seven-member Isthmian Canal Commission appointed by President Roosevelt. This Federal agency was responsible for construction of the Panama Canal, reporting directly to the Secretary of War and the President of the United States. Major-General George Davis became Governor of the Canal Zone, John Wallace was Chief Engineer, and Dr. William Gorgas was Chief Sanitation Officer. The Commission did not work well together. On 1 April 1905, President Roosevelt directed the Commission Chairman, Chief Engineer, and Canal Zone Governor to constitute an executive committee. In July, Wallace resigned and was replaced by John Stevens. He was recommended by James T. Hill of Minnesota, whom he worked for as a railroad engineer in 1889.²¹

¹⁹ DuVal, Cadiz to Cathay, 124, 130-131, 138-140, 333-340, 482-492; McCullough, Path Between the Seas, 341-342, 371-377; U.S. Senate, Chronology, 3; Joseph Bucklin Bishop and Farnham Bishop, Goethals: Genius of the Panama Canal, (New York and London: Harper and Brothers Publishers, 1930), 117-119.

²⁰ DuVal, Cadiz to Cathay, 418-419; U.S. Senate, Chronology, 4; McCullough, Path Between the Seas, 322-324.

²¹ McCullough, Path Between the Seas, 407, 421, 449, 457, 459; Suzanne Johnson, "An American Legacy in Panama: A Brief History of the Department of Defense Installations and Properties, The Former Canal Zone, Republic of Panama," (Corozal, Panama: Directorate of Engineering and Housing, United States Army Garrison-Panama, 1995), 12.

Stevens moved the administration offices from Panama City to the Culebra Cut, where the largest excavation work was done. Under Wallace, working conditions had deteriorated, and Stevens' first task was cleaning up. He supported Gorgas, who believed yellow fever-carrying mosquitoes, could be eradicated through proper sanitation, by giving him four thousand workers and an unlimited budget for supplies. The cities of Panama and Colon were fumigated house by house, provided with running water, and streets were cleaned and paved. Entire new communities were established. The yellow fever epidemic was stopped by the end of 1905, but workers were still suffering and dying from malaria, pneumonia, tuberculosis, and intestinal diseases.

Once the yellow fever was contained, Stevens resumed construction. The Panama railroad was essential for transporting dirt, and he devised an elaborate double-tracking plan for dirt trains to be constantly moving in and out of the Culebra Cut. By the end of 1906, there were almost 24,000 workers. White Americans made up the bulk of the skilled laborers, averaging a salary of \$87 per month. Unskilled laborers, mostly Blacks from the Caribbean Islands, were paid ten cents an hour, and worked ten-hour days.²²

The next decision was the type of canal to be built, sea-level or lock. The sea-level was originally planned, but Stevens was concerned that it would cost \$100 million dollars more and take three or four years longer to build. A lock passage would be wider and safer for ships. The lock proposal was recommended by the Commission in February, approved by the President, and approved by Congress in June. There would be a dam for the Chagres River built at Gatun, nearly a mile and a half long and over a hundred feet high. The lake would be eighty-five feet high. A ship would enter three locks built at the east end of the dam, elevate to the level of the lake, travel twenty-three miles across the lake, then nine miles through the Culebra Cut. At Pedro Miguel there would be a lock and small dam. The ship would be lowered thirty-one feet to a small lake, pass through two locks at La Boca, return to sea-level and head into the Pacific Ocean. With the creation of a Gatun Lake, 164 square miles of jungle would be under water, and a new railroad would have to be built.²³

In November 1906, Roosevelt went to Panama, becoming the first sitting president to leave the United States. At this time 6,000 Americans were working in the Zone. Roosevelt was impressed by progress on the Culebra Cut, in health and sanitation. Although he went in the rainy season, he admired the natural beauty of the tropical land. After his return, he wrote the "Special Message Concerning the Panama Canal" to Congress, including photographs and sketches, and urged the country to take notice. "It is a stupendous work upon which our fellow

²² Bishop and Bishop, Goethals, 125-128; McCullough, Path Between the Seas, 448, 457-473, 480.

²³ McCullough, Path Between the Seas, 483-489.

countrymen are engaged in down there on the Isthmus," he said. "No man can see these young, vigorous men energetically doing their duty without a thrill of pride..."²⁴

However, by February 1907, within a few weeks of each other, Stevens and Commission Chairman Theodore Shonts resigned. Secretary of War William Howard Taft recommended Major (soon to be Lieutenant Colonel) George Washington Goethals to replace Stevens. He was officially approved on 18 February 1907 and given complete authority. Goethals came from West Point and the Corps of Engineers, where he was assistant to the Chief of Engineers, and became a member of the General Staff under Secretary Elihu Root in 1903.

By the end of his first year, several important engineering changes has been made. The bottom of the channel of the Culebra Cut was widened from two hundred to three hundred feet. The lock chambers were enlarged from 95 to 110 feet. A breakwater was planned for the Pacific side to prevent mud from clogging entrance to the Canal. The dam and second set of locks were pulled from Sosa Hill and moved to Miraflores, farther away from the Pacific. The Pacific locks would then be better prepared for a sea attack. Goethals had chiefs running three geographic units, the Atlantic, Central, and Pacific Divisions. He estimated the new railroad would take five years and cost \$9 million. Lieutenant Colonel Harry Foote Hodges was in charge of designing the locks, and was Goethals' second-in-command.²⁵

The struggle to dig the Culebra Cut lasted seven years. The most difficult setbacks were the mudslides, particularly at Cucaracha on the east bank. In October 1907, after heavy rains, an avalanche deposited 500,000 cubic yards of mud in the canal. After 1911, when the Cut was deeper and rock formations became unstable, slides were more frequent. Shovels, trains, tracks, and cars would be completely buried. In 1912, four and a half months were spent removing slides. Thirty buildings from the town of Culebra had to be moved back. The uppermost portions of the Cut were dug at an angle to help decrease the pressure. The workers referred to the Cut as "Hell's Gorge."²⁶

Work on the locks began in 1909 and took about four years. The bases of the lock chambers were concrete, with steel gates. The walls were a thousand feet long and eighty feet high. Six pairs of chambers were built (to handle two lanes of traffic). Gates were opened and closed by steel struts connected to "bull wheels" twenty feet in diameter, which were geared to an electric motor. The locks were controlled by a central control board. By the summer of 1913, the locks and the Cut were finished. On 26 September at Gatun, water was first turned into the locks. On

²⁴ Ibid., 492-493, 498-500.

²⁵ Bishop and Bishop, Goethals, 137-141, 153-156, 193, 204, 211-12; McCullough, Path Between the Seas, 503-511, 539-543.

²⁶ McCullough, Path Between the Seas, 549-554; Bishop and Bishop, Goethals, 207-209.

10 October, President Woodrow Wilson pressed a button in Washington that carried to Panama to blow up the Gamboa Dike and fill the Culebra Cut. This act also marked the final stage in the creation of Lake Gatun, the largest man-made lake at that time. In 1914, Wilson disbanded the Isthmian Canal Commission, and named Goethals the first Governor of The Panama Canal. The position of Governor was the head of a civilian agency, but the governor was always a military man, most often from the Army Corps of Engineers. On 15 August, in a small ceremony, the Canal opened when the ship *Ancon* successfully passed through.²⁷

From 1904 to its opening, the Canal had cost \$352 million, and 5,609 workers died. The United States also agreed to pay Colombia \$25 million over disputes from the Panama Revolution, and allowed certain Colombian ships free transit. Normal tolls for the Canal were ninety cents per cargo ton. In September of 1915, an avalanche in the Culebra Cut (renamed the Gaillard Cut after David Gaillard, who served as Chief of the Central Division under Goethals) closed the Canal for seven months. World War I in Europe dampened enthusiasm for the Canal in the first few years, but by 1924, the Canal was handling more than five thousand ships per year. Its creation has to be considered one of mankind's greatest accomplishments.²⁸

Construction for Canal Zone Communities

From the beginning of the Canal project, ancillary construction was necessary to provide for the social and business needs of the enterprise. Housing, offices, health care facilities, recreational facilities, retail establishments, public safety; all aspects of life represented some need for shelter. The Federal agency responsible for construction of the Canal also provided for the building needs. During construction of the Canal, this agency was the Isthmian Canal Commission. Upon completion of the Canal in 1914, this agency was disbanded and The Panama Canal was created to operate and maintain the Canal and administer the Canal Zone. In 1951, the agency was reorganized as the Panama Canal Company, and remained as such until the Panama Canal Treaty of 1977. Upon treaty implementation, the Panama Canal Company was disestablished and replaced by the Panama Canal Commission, a joint U.S.-Panamanian agency. This administrative body will remain in place until the end of the U.S. presence in Panama on 31 December 1999.

²⁷ McCullough, *Path Between the Seas*, 594-599, 604-609; Bishop and Bishop, *Goethals*, 260-264; Herbert and Mary Knapp, *Red, White, and Blue Paradise: The American Canal Zone in Panama*, (San Diego, CA: Harcourt Brace Jovanovich, Publishers, 1984), 124; Mack, *The Land Divided*, 513; U.S. Senate, *Chronology*, 5.

²⁸ McCullough, *Path Between the Seas*, 610-614; Bishop and Bishop, *Goethals*, 267-268; U.S. Senate, *Chronology*, 5.

Chief Engineer John F. Wallace established the first ICC architectural department 23 July 1904, with M. O. Johnson as Chief Architect.²⁹ Johnson died of yellow fever in the spring of 1905, and A. M. Burt became the supervising architect and head of the Bureau of Architecture and Building, with P. O. Wright as assistant supervising architect.³⁰ In September 1906, the name was changed to the Division of Building Construction.³¹ On 1 August 1908, the Division of Building Construction was abolished, and its duties and personnel were reassigned to the Division of Engineers and the Chief Quartermaster. The drafting staff were transferred to the Chief Engineer's office.³² It was during this early period that the majority of temporary quarters were designed and constructed, being designated as "type houses." By 1907, there were twenty-two different types ranging from a 1-story, 1-family married quarters to a 2-story, 24-room bachelor quarters.³³

Every aspect of life for the employees of the ICC (and the later administrative organizations) was defined by their status. A system of racial discrimination prevailed which recognized two main classes of employees based upon the standard used for their pay. "Gold" employees were skilled workers and almost always white Americans. "Silver" employees provided unskilled labor and were predominantly black West Indians. These distinctions effectively segregated the work force and their families. In some cases separate, but definitely not equal, facilities were built for both groups, and separate waiting lines were established for shopping. Hospital wards were separated by race, and the children of "gold" and "silver" employees went to different schools. The "silver" construction towns provided crude, common barracks and mess facilities for workers, as well as a few family quarters. As a result, the majority of "silver" married workers had to rely upon renting tenements in Colon or Panama City, or simply setting up slums in the jungle with scavenged materials. "Gold" towns possessed housing specifically designed to be comfortable and equipped to withstand the tropical conditions. These towns were also equipped with clubhouses, bandstands, hotels, ballparks, Y.M.C.A.s and churches.³⁴ The full range of ancillary structures required to support the creation of the Panama Canal was enormous. In 1908, for example, the Annual Report contains this accounting:³⁵

²⁹ Canal Record, 11 December 1907, 117; McCullough, Path Between the Seas, 449.

³⁰ Isthmian Canal Commission, Annual Report of the Isthmian Canal Commission for the Year Ending December 1, 1905, (Washington, D.C.: GPO, 1905), 147; McCullough, Path Between the Seas, 451.

³¹ Isthmian Canal Commission, Annual Report of the Isthmian Canal Commission for the Year Ending December 1, 1906, (Washington, D.C.: GPO, 1906) 99.

³² Canal Record, 22 July 1908, 375.

³³ "Type Houses," January 1907, File 13-A-8, Part 1, General Records 1914-34, Records of The Panama Canal, 1914-1950, Record Group 185, National Archives, Washington, DC.

³⁴ McCullough, Path Between the Seas, 472, 478, 576; Stephen Frenkel, "Geography, Empire, and Environmental Determinism," Geographical Review 82, (April 1992): 147-148.

³⁵ Isthmian Canal Commission, Annual Report of the Isthmian Canal Commission for the Year Ended June 30, 1908, (Washington, D.C.: GPO, 1909), 93.

Among the more important items of construction performed by this division [Building Division] during the year are the following: 33 hospital buildings, 37 storehouses, 7 fire department buildings, 9 laborers' bath houses, 26 laborers' range closets, 6 fumigation houses, 5 corrals, 9 schoolhouses, 5 commissaries, 1 clubhouse, 4 post-offices, 9 office buildings, 2 lodge halls, 18 standard laborers' barracks, 5 band stands, 2 Gallego mess halls, 5 hotels, 4 jails, 8 powder and detonator houses, 4 markets, 35 shop buildings, 8 laborers' washhouses, 3 bridges, and 200 type quarters for "gold" employees.

Sanitary guidelines and climate considerations were incorporated into the design of Canal Zone structures from the beginning, especially the facilities constructed for the "gold" employees. "The French plans and buildings furnished some valuable features of tropical architecture. These were fully appreciated by the Architectural Department, and were later incorporated in the design of buildings erected by the Commission."³⁶ It was decided that a style of architecture was needed where all buildings were constructed of wood with "plenty of openings for ventilation; and every opening, including verandas, must be provided with fine copper screening in order to, just as far as practicable, exclude all mosquitos."³⁷

Required building materials had to stand shipment from the States with little or no damage. Wood and concrete became the main structural components, with corrugated, galvanized iron for roofing. Concrete footings supported wood foundation posts raising the structures off the ground. Walls were wooden, often with exposed studs on the interior, as empty space between the walls created by an interior sheathing provided a breeding ground for rats.

Where available, the houses were connected to sewer and electric lines. The need for electricity was perhaps higher than in a more temperate environment, because of the problems with mold engendered by the tropics. Typical closets provided an ideal environment for the growth of mold, so the "better class" of houses included a "dry room" which could be closed up tightly and in which an electric bulb burned continuously. This problem continued until air conditioning was installed between 1957 and 1960. According to a longtime Canal resident, "...if you left your shoes under the bed for a couple of days, they sprouted beards of mold. Shoes had to be kept in 'dry closets' where light bulbs burned day and night. Light bulbs burned inside 'dry cupboards,' too, and hung on extension cords inside pianos."³⁸

³⁶ Canal Record, 11 December 1907, 117.

³⁷ Isthmian Canal Commission, Annual Report, 1906, 100-101.

³⁸ Knapp and Knapp, Red, White, and Blue Paradise, 42.

This construction camp style of architecture was to predominate almost exclusively until permanent communities were begun after completion of the Canal. This style was arrived at through efforts to develop sanitary and comfortable housing, and presented a distinctive appearance. Arriving in the construction town of Culebra in 1907, Mrs. Gaillard described the upper echelon housing as "...an enormous cube, entirely enclosed in wire screening and lifted high on spindling foundations."³⁹ The grouping of houses, bare of screening foliage due to mosquito eradication efforts, caused her to remark on these "...houses as queer and ungainly as ours which stood here and there on the hillside like gargantuan bird cages!"⁴⁰

As Canal construction drew to a close, the ICC began to plan for the communities necessary to permanently house and maintain the operating work force. In 1912, the ICC hired Mr. Austin W. Lord of New York to direct the design aspects of the permanent construction. At that time, Mr. Lord was the senior member of the firm Lord, Hewlett, and Tallant concurrent with being head of the Architecture Department at Columbia University. Mr. Lord spent part of July and August 1912 on the Isthmus studying local conditions and meeting with Canal officials. It was decided to present a unified scheme where all permanent buildings would be of the same style.⁴¹

Mr. Mario J. Schiavoni was hired as Mr. Lord's assistant on the Isthmus. General drawings were produced in the New York office, and working drawings were completed in Panama. Mr. Lord's plans were primarily focused on the Administration Building and the planned "gold" town of Balboa. Among the plans prepared by his office were official and permanent quarters, a post office, schoolhouse, hotel, social hall, fire and police stations, dispensary, church, telephone building, clubhouse, and commissary store. Landscape architect William L. Phillips was responsible for permanent townsites, streets, parks, and other necessary features.⁴²

This organization continued until August 1913, when the arrangement with Mr. Lord ended and Mr. Schiavoni was placed in charge of the designs for the primary company town of Balboa.⁴³ Mr. Schiavoni resigned on 5 December 1913, and was succeeded by Mr. Samuel M. Hitt as

³⁹ Katherine Gaillard, manuscript, published as "Katherine Gaillard writes of Canal construction days, part 2: first impressions," Panama Canal Spillway, n.d.

⁴⁰ Ibid.

⁴¹ Canal Record, 7 August 1912, 397.

⁴² Canal Record, 7 August 1912, 397; Isthmian Canal Commission, Annual Report of the Isthmian Canal Commission for the Year Ended June 30, 1913, (Washington, D.C.: GPO, 1913), 21; Canal Record, 18 June 1913, 361.

⁴³ U.S. Senate, Panama Canal: Message From the President of the United States Transmitting a Report by the Commission of Fine Arts in Relation to the Artistic Structure of the Panama Canal, 63rd Cong., 1st sess., 1913, S. Doc. 146, 13.

architect.⁴⁴ The buildings they designed had to meet sanitary regulations such as being "rat proof" and well-screened. For durability and economic concerns, it was decided to construct them from reinforced concrete with clay tile roofs.⁴⁵ This red and white color scheme, along with the common design elements of large screened porches, numerous windows, and some restrained Mediterranean, Spanish Colonial Revival or Mission stylistic devices provide a continuity of appearance from one end of the Canal to the other.

Fortifying the Canal

The Hay-Paueforte and Hay-Bunau-Varilla treaties implied but did not specifically give the United States the right to fortify the Canal Zone. Central to America's decision to fortify was Article Three of the Hay-Bunau-Varilla treaty, which gave the United States all powers, rights, and authority in the Zone. Panama protested in 1904 when the United States government used this sovereignty in establishing ports of entry, customhouses, tariffs, and post offices in the Zone. An amendment giving some concessions to Panama in those areas was made after Secretary of War Taft, George Goethals, and other Army leaders visited the Isthmus in November 1904 to determine questions relating to possible fortifications. The amendment was supposed to be in effect only during the construction period, but it lasted until 1924, and efforts for a new treaty were unsuccessful.

The debate over Canal fortification continued until 1911, when the House of Representatives made a \$2 million appropriation for that purpose. The following year, they added \$1 million for gun and mortar batteries and \$200,000 for land defenses. Construction began on 7 August 1911 under Sydney Williamson, Goethals' Chief of the Pacific Division, and on 1 January 1912, Goethals' son, Lieutenant George R. Goethals, was put in charge of fortification work. The no longer needed construction towns of Empire and Culebra were used for the Army garrisons. There were large forts with gun batteries built at each end of the Canal, with field work for six thousand mobile force troops (infantry, cavalry, engineer, signal, and field artillery). The work of The Panama Canal staff increased significantly with the 1915 military appropriation of \$1,290,000, and subsequent assignment of Army barracks and quarters construction. All design and construction work for Army post buildings was assigned to The Panama Canal. Much of the early quarters construction undertaken by The Panama Canal for the Army utilized existing "type house" designs. By June 1915, almost \$15 million had been spent on fortifying the Canal,

⁴⁴ Isthmian Canal Commission, Annual Report of the Isthmian Canal Commission and The Panama Canal for the Fiscal Year Ended June 30, 1914, (Washington, D.C.: GPO, 1914), 311.

⁴⁵ The Panama Canal, Annual Report of the Governor of the Panama Canal for the Fiscal Year Ended June 30, 1915, (Washington, D.C.: GPO, 1915), 32, 62.; Canal Record, 18 June 1913, 361; The Panama Canal, Annual Report of the Governor of the Panama Canal for the Fiscal Year Ended June 30, 1916, (Washington, D.C.: GPO, 1916), 285; Johnson, "An American Legacy in Panama," 20.

including the locks and dams. Military reservations were officially designated on 18 September 1917 as Fort Grant, Fort Amador, Fort Sherman, Fort Randolph, and Fort de Lesseps.⁴⁶ That same year The Panama Canal designers were asked "...to furnish preliminary plans and estimates for cantonment construction for Army troops and for the proposed permanent posts for mobile troops on the Canal Zone."⁴⁷

This request developed from the investigation and findings of an Army Board of Officers convened to recommend post locations for the troops in the Canal Zone, and to recommend the type and character of buildings required. The Board members represented the Infantry, Engineer Corps, Cavalry, Medical Corps, and Field Artillery. In their report, dated 28 August 1917, the Board recommended placing one brigade of infantry at Gatun, and all other mobile force troops on the Pacific side. There, they supported the location of one infantry brigade at Miraflores Dump, another adjacent to the Curundu River, and one artillery brigade and one cavalry regiment south of the Diablo Ridge. Corozal was the location recommended for the sanitary troops, the Signal Corps troops, and the Engineer regiment, as well as for the main supply depot site. Quarry Heights (created on the site of the former Ancon Quarry) would serve as department and division headquarters.⁴⁸

The placement of troops on the Isthmus did not wait for the construction of military reservations. As early as 1903, there was a Marine detachment present which kept the Panama Railroad open during the revolution. This detachment remained until January 1914, and at the end consisted of 12 officers and 375 enlisted men. The first permanent Army troops (Tenth Infantry) arrived in October 1911 and were stationed at Camp E. S. Otis in Empire. Three companies of the Coast Artillery Corps arrived on the Isthmus September 1914 and were in temporary quarters at Fort Amador and Fort Sherman by November. That same month the Fifth Infantry arrived with several members of the Medical Corps and the Quartermaster Corps, and the regiment was quartered at Empire. Continued arrivals placed the troop strength on the Canal Zone at

⁴⁶ Marshall, *Story of the Panama Canal*, 202-203; Bishop and Bishop, *Goethals*, 132, 221; Mack, *The Land Divided*, 512-513; Frederic J. Haskin, *The Panama Canal*, (Garden City, NY: Doubleday, Page & Company, 1913), 283-284; The Panama Canal, *Annual Report 1915*, 31-32; George M. Wells, Resident Engineer, The Panama Canal to Governor, The Panama Canal, January 27, 1916, File 13-U-2/25, Part 2, January 1, 1916-April 30, 1934, General Records 1914-34, Records of The Panama Canal, 1914-1950, Record Group 185, National Archives, Washington, DC.

⁴⁷ The Panama Canal, Annual Report of the Governor of The Panama Canal for the Fiscal Year Ended June 30, 1917, (Washington, D.C.: GPO, 1917), 75.

⁴⁸ Board of Officers to Brigadier General A. Cronkhite, U.S.A., August 28, 1917, File 13-U-2/25, Part 2, January 1, 1916-April 30, 1934, General Records 1914-34, Records of The Panama Canal, 1914-1950, Record Group 185, National Archives, Washington, DC.

approximately 5,000 when the United States entered World War I.⁴⁹ Authority over the Panama Canal and the Canal Zone was transferred from the Canal Zone Governor to the commanding general of the U.S. Army forces in the Canal Zone by President Woodrow Wilson in a 9 April 1917 Executive Order.⁵⁰ An additional Executive Order was used to proclaim the neutrality of the Canal on 23 May 1917.⁵¹

A consolidated command called United States Troops, Panama Canal Zone had been put into place on 6 January 1915 under Brig. Gen. C. R. Edwards, as part of the Eastern Department. Initially located at Ancon, the headquarters were moved to Quarry Heights in 1916. A separate geographical department was created 1 July 1917 and named the Panama Canal Department of the United States Army. Also headquartered at Quarry Heights, the Department was first commanded by Brigadier General Cronkhite.⁵² The war passed quietly enough in the Canal Zone, and control of the Canal was returned to the Governor at the war's end.

For the Panama Canal Department, the inter-war years provided an opportunity to increase defensive strength by creating permanent posts and upgrading defenses against the growing threat of air attack. By late 1920, the Army aviation base of France Field, and the infantry bases of Fort Clayton (Pacific) and Fort Davis (Atlantic) were in place and manned. A Pacific side air field (Albrook Field) was constructed in 1931.⁵³

When Canal defense requirements were first considered, the threat to be countered was primarily a naval one. Armament and fortifications were planned to repel a frontal naval assault and landing. As aviation technology developed, aerial attacks were perceived as a growing threat, and steps were taken to counteract it. The Army Air Service in the Canal Zone was implemented to "gain and maintain sufficient air superiority to secure the Canal and its accessories against an air attack, to observe fire for the Coast and Field Artillery, to cooperate with the Infantry, to attack any enemy land or naval forces and to cooperate with the Navy in the execution of its mission."⁵⁴ From an initial complement in March 1917 of 2 officers, 51 enlisted men and 2 Curtiss R-4 planes, the air defenses of the Panama Canal Department were expanded in the inter-

⁴⁹ "The Army and Navy: The military and naval activities on the Canal Zone are important elements of the Canal enterprise," in Panama Canal: Twenty-Fifth Anniversary, 1914-1939, (Mount Hope, Canal Zone: The Panama Canal Press, 1939), 93-94.

⁵⁰ Dolores De Mena, "History of the United States Army in the Panama Canal Area," Unpublished manuscript, USARSO History Office, Ft. Clayton, Panama, 1994, 4.

⁵¹ Canal Record, 13 June 1917, 515.

⁵² "The Army and Navy," 94; John R. Baldwin, "History of the Panama Canal Department," Infantry Journal 26 (April 1925): 367-368; De Mena, "History of the United States Army in the Panama Canal Area," 4.

⁵³ Baldwin, "History of the Panama Canal Department," 369; De Mena, "History of the United States Army in the Panama Canal Area," 4-6.

⁵⁴ T. S. Voss, "The Army Air Service," Infantry Journal 26, (April 1925): 417.

war period. France Field was constructed near the Atlantic terminus city of Colon and by 1925 was staffed with 38 planes, 57 officers and 623 enlisted men.⁵⁵ This same year saw the Coast Artillery District abolished and Coast Defense units organized into regiments with separate anti-aircraft batteries.

In 1932, the Department was divided into Atlantic and Pacific sectors. The Atlantic Sector contained France Field and Forts Sherman, Randolph, Davis, and de Lesseps, while Forts Amador, Clayton, and Kobbe, Albrook Field, the Post of Corozal, and the Panama Air Depot were located in the Pacific Sector.⁵⁶ Headquarters remained at Quarry Heights. In January 1934, the Department consisted of 419 officers and 8,884 enlisted men. This manpower level was considered to be restrictive, and by 1936 enlisted strength had increased to 12,990.⁵⁷

Diplomatic issues continued to be negotiated between Panama and the United States. The Hull-Alfaro Treaty, signed on 2 March 1936, helped settle differences over the devaluing Panama dollar and the Canal annuity payments. It guaranteed joint action and consultation between the countries in times of emergency. The United States also gave up the right to intervene in Panama to maintain public order. After debate in the United States that it did not adequately protect American interests in the area, the Senate ratified it three years later.⁵⁸

As World War II broke out in Europe, efforts were underway in the Canal Zone to heighten defenses. One of these efforts had both defensive and economic justifications. The original Canal designers were aware that transit capacity would need to be increased in the future, both in the size and number of ships able to transit at any one time. After several years of military and civilian study, Congress authorized the construction of an additional set of locks in 1939. Known as the "third locks project," new, larger locks would be constructed near the existing ones at Gatun, Pedro Miguel, and Miraflores to increase capacity. For defense purposes, they would be built some distance away (1,500 to 3,000 feet) and connected to the existing locks by approach channels. An initial appropriation of \$15,000,000 was made through the War Department Civil Appropriations Act of 1941. The total cost was estimated at \$277,000,000. A Special Engineering Division of the Department of Operation and Maintenance was created to handle the work in close cooperation with existing Panama Canal organizations. Canal forces had been producing plans for the design and construction and selecting potential key employees

⁵⁵ Ibid.

⁵⁶ Panama Canal Department Historical Section, History of the Panama Canal Department, vol. 1, Introduction and Historical Background 1903-1939 (n.p., 1949), 48; "The Army and Navy," 94.

⁵⁷ Panama Canal Department, vol. 1, Introduction and Historical Background 1903-1939, 49-50.

⁵⁸ U.S. Senate, Background Documents Relating to the Panama Canal, Committee on Foreign Relations, (Washington, D.C.: GPO, 1977), 972-975, hereafter cited as U.S. Senate, Background Documents; U.S. Senate, Chronology, 4-5.

in the United States since the 1939 authorization. Among the first orders of business were three new construction towns (Caecal, Diablo Heights, and Margarita) for the estimated 6,300 employees and dependants associated with the project.⁵⁹

Excavation at the Pacific end of what would be the approach channel to the new Miraflores lock was begun on July 1, 1940. The new locks were designed to be used by the 58,000 ton *Montana* class battleships on order for the Navy. As the threat of war heated up, this consideration soon outweighed those of commerce. Upon the United States' entry into the war, continuation of the project was uncertain. There was strong Navy support for completing the project as soon as possible to accommodate the warships due in late 1945. Through a series of meetings held in January 1942, the War Department decided to accept the Navy position and to press for rapid completion. Some military officers, however, felt the extra locks only provided another target for air attack. Several months later circumstances changed when the Navy indefinitely postponed the battleship construction program. As a result of these factors, the War Department, the Navy, and the President all concurred in a decision to halt almost all work on the third locks, effectively canceling the project.⁶⁰

As World War II approached, Canal Zone Army installations were reinforced by increasing the troop strength in Panama from 13,451 in 1939 to 31,400 by the time of the United States' entry in December 1941. Housing these reinforcements constituted only part of a large construction program, however, as some troops arrived before construction had begun, housing was given the highest priority. Congress appropriated \$50,000,000 in June 1939. Subsequent contract discussions delayed calls for bids until March 1940. In the meantime, soldiers cleared vegetation, prepared sites and even put in footings. Once begun, actual construction was swift, as it was essential to get men and materiel out of tents and into buildings as quickly as possible. Even so, the job was tremendous and every available soldier was detailed to some aspect of construction. There was a severe shortage of civilian labor due to the competing demand for workers on the Third Locks project, and the additional labor force required only increased the ongoing housing shortage.⁶¹ Due to the severe time constraints, much of the new construction was of a temporary nature. Commonly, this resulted in the use of existing building plans, but the

⁵⁹ The Panama Canal, The Third Locks Project, (Canal Zone, Panama: The Panama Canal, 1941), 1-4; John Hannaman, interview by Susan Enscoe, 8 February 1994, Directorate of Engineering and Housing Office, Corozal, Panama.

⁶⁰ Stetson Conn, Rose C. Engelman, and Byron Fairchild, The Western Hemisphere: Guarding the United States and Its Outposts, vol. 12 of United States Army in World War II, ed. Stetson Conn (Washington, D.C.: GPO, 1964), 319-321.

⁶¹ Susan Harp, "Panama Canal Defense Vital During Second World War," Panama Canal Spillway, 2 July 1993; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 309; Panama Canal Department Historical Section, History of the Panama Canal Department, vol. 2, Preparation for War 1939-1941 (n.p., 1949), 53, 67.

substitution of readily available, less expensive, and less labor-intensive construction materials. Designs were stripped down to the essentials, and all ornamental details were eliminated. Temporary structures were less durable, and were often meant to be easily disassembled and re-erected elsewhere.

Emergency measures were initiated in the last days of August 1939, and in addition to troop build-up, included anti-sabotage measures and a change of Canal authority. The Army garrison was given the mission of "protecting the Canal against sabotage and of defending it from positions within the Canal Zone."⁶² The Navy was tasked to provide offshore defense, provide armed guards for ships transiting the Canal, and maintain a harbor patrol at both ends of the Canal.⁶³ As early as 5 September 1939, an Executive Order was issued transferring jurisdiction and authority over the Canal and the Canal Zone to the Army's Panama Canal Department.⁶⁴ Eventually, photography of Canal installations was banned for the duration, mines were placed at both entrances to the Canal, low altitude barrage balloons were placed over the locks with anti-submarine and torpedo nets placed in front of the locks, and chemical smoke pots were positioned throughout a sixty square mile area. The massive guns and batteries on military installations at either end of the Canal were prepared for use. The 6 to 16 inch guns were housed in 11 Atlantic and 12 Pacific batteries, and had a range up to 25 miles. To protect against air attack, anti-aircraft batteries were put in place across the Zone and two anti-aircraft detachments were sent in September 1939. Two long range radar stations were also established that autumn. The main runway at Albrook Field was improved to allow deployment of the more modern bombers which had arrived in June 1939. Military dependants were evacuated to the United States by October 1941.⁶⁵

Also around 1939, the Panama Canal Department commander began an effort to secure additional defense sites outside the Canal Zone in the Republic of Panama, primarily for airfields. Dozens of sites were eventually requested, but action on this request ran into diplomatic trouble between the United States and Panama. The primary problems were leasing versus buying the sites, and the limits of United States defense authority as defined in the as yet unratified 1936 Hull-Alfaro Treaty. The Treaty was finally ratified on 17 April 1939, and negotiations continued for the additional defense sites even as funding was allocated to lease them from the Panamanian government. An agreement was reached on 21 March 1941 to allow United States forces to acquire sites and begin use before final formal approval. On 18 May

⁶² Conn, Engelman, and Fairchild, *Guarding the United States and Its Outposts*, 302.

⁶³ *Ibid.*, 302-303.

⁶⁴ Harp, "Panama Canal Defense Vital During Second World War," 2 July 1993.

⁶⁵ Harp, "Panama Canal Defense Vital During Second World War," 2 July 1993 and 5 November 1993; Conn, Engelman, and Fairchild, *Guarding the United States and Its Outposts*, 304, 310-316.

1942, the two countries signed the Defense Sites Agreement, in which the United States would build 134 bases leased from Panama to use until one year after the end of the war.⁶⁶

In 1941, a major command reorganization was precipitated by the United States' taking into protective custody the British possessions (and prospective base sites) of Jamaica, Antigua, St. Lucia, Trinidad, and British Guiana. To administer these new bases, and to quell issues of command extent between the various Army and Navy forces in the area, a theater command was established. The Caribbean Defense Command was officially activated on 10 February 1941, under the command of General Daniel Van Voorhis, then the commander of the Panama Canal Department. The Caribbean Defense Command was initially set up as strictly Army, and coordination with Navy operations was by "mutual cooperation." A separate command, the Caribbean Air Force, was established for air defense about the same time. General Frank M. Andrews succeeded General Van Voorhis in August 1941.⁶⁷

The Army and Navy personnel in Panama had been on full alert since midsummer 1941. The first immediate effects of the United States' December entry into the war were ones of command structure and reinforcements. The first order of business was to create a unified command through which the Army and Navy could be coordinated. President Franklin D. Roosevelt placed the Army in charge of the Panama sector, and the Navy in charge of the more distant Caribbean Coastal Frontier on 12 December. General Andrews thus became commander of the Army and Navy on 18 December.⁶⁸ Both air and ground forces were heavily augmented over the next two months, with the Panama garrison strength reaching 39,000 by the end of December, and rising to 47,600 by the end of January 1942.⁶⁹

For those living and working in the Canal Zone, World War II was "a time of perceived danger during which the movement of materiel, troops and supplies through the waterway was a critical part of the war effort."⁷⁰ While Panama and the Canal both escaped enemy attack, a damaging U-boat campaign was carried out against shipping in the Caribbean. From February through December 1942, some 270 ships in the area had been sunk by U-boats.⁷¹ Caribbean Defense Command peak strength of 119,000 was reached in December 1942. Of these, over half were stationed in Panama to protect the Canal from attack or sabotage.⁷² By mid-summer 1943, the U-

⁶⁶ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 306-309, 344-348.

⁶⁷ *Ibid.*, 327-335.

⁶⁸ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 409-412; Panama Canal Department Historical Section, History of the Panama Canal Department, vol. 3, The War Period 1941-1945, (n.p., 1949), 1-3.

⁶⁹ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 412.

⁷⁰ Harp, "Panama Canal Defense Vital During Second World War," 2 July 1993.

⁷¹ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 424.

⁷² *Ibid.*, 414.

boat threat was receding due to increased effectiveness of the theater's antisubmarine forces, the effects of Allied victories in other waters, and the shift of U-boats away from the Caribbean.⁷³

With the threat of Canal attack diminishing, the reduction of troop strength became a viable option. Downsizing was begun in January 1943, and continued until the end of the war. From a peak of 119,000, Army forces had dropped to 91,000 by the end of 1943. When the war in Europe ended in May 1945, Caribbean Defense Command strength was down to 67,500.⁷⁴ War-time defenses, including large artillery guns, landing fields, and mine fields were removed as the military returned to a peace-time defensive position. The Caribbean Defense Command was reorganized into the U.S. Army Caribbean and the Caribbean Command (a unified authority over the Army, Navy, and Air Force components).⁷⁵ This command structure would last until 1963, when the Caribbean Command was redesignated as the United States Southern Command (USSOUTHCOM), and the Army component became the United States Army Forces Southern Command (USAFSO). The major Army command would be inactivated in 1974, then re-activated as the United States Army South (USARSO) in 1986.⁷⁶

In October 1947, the United States tried to negotiate an agreement for five more years occupation of thirteen auxiliary World War II sites, and the military air base at Rio Hato, seventy miles west of Panama City, for ten to twenty years. In December, with pressure from the Communist Party in Panama and student anti-American demonstrations, the Panamanian Assembly unanimously rejected the agreement, and the United States agreed to evacuate the remaining fourteen sites immediately, while continuing to negotiate. With national elections coming up in 1948, members wanted to reduce American influence in Panama as much as possible to appease the voters.⁷⁷

In the 1950s, the United States made several concessions to the Panamanians: a single pay scale for American and Panamanian workers was established; Spanish became an official language in the Zone along with English; and Panama was given more money for Canal toll collections. The United States was given 19,000 acres in the Rio Hato area for military training. Panama, however, twice rejected requests by the U.S. to deploy Nike missiles in 1956 and 1958. Two

⁷³ Ibid., 437.

⁷⁴ Ibid., 441.

⁷⁵ De Mena, "History of the United States Army in the Panama Canal Area," 9.

⁷⁶ Ibid., 11, 14.

⁷⁷ U.S. Senate, Background Documents, 921-923, 975-979; U.S. Senate, Chronology, 6; Almon R. Wright, "Defense Sites Negotiations between the United States and Panama, 1936-1948," Department of State Bulletin, vol. 27, 11 August 1952, 212-217; Paul Ryan, The Panama Controversy: U.S. Diplomacy and Defense Interests, (Stanford, CA: Hoover Institution Press, 1977), 28-31; Paolo E. Coletta, ed., United States Navy and Marine Corps Bases Overseas, (Westport, CT: Greenwood Press, 1985), 259; U.S. Department of the Navy, Naval Historical Center, Washington, DC, Operational Archives.

ground-to-air HAWK-AW missile batteries were deployed in 1960 at Fort Sherman and Fort Amador. Growing nationalistic sentiment expressed in student demonstrations in 1955, 1958, 1959, and 1964 helped to finally convince the United States to renegotiate the Hay-Bunau-Varilla Treaty.⁷⁸

In 1974, the United States, under chief negotiator Ellsworth Bunker, agreed in principle to give the Panama Canal and the Canal Zone back to Panama. There were then about 46,000 people living in the Canal Zone. Most (30,000) were active duty military, their dependents, and civilian employees. Roughly 10,000 Americans (employees and dependents) were associated with the Panama Canal Company. During the administrations of President Jimmy Carter and General Omar Torrijos, two treaties were negotiated. The first, called the Panama Canal Treaty, abolished the Canal Zone and returned the territory to Panama, with the United States having the authority to manage, operate and defend the Canal with increasing participation by the Republic of Panama. At noon on 31 December 1999, Panama will assume control of the area and responsibility for the Canal as the United States' presence ends. The second treaty gave the United States the permanent right to defend, jointly with the Republic of Panama, the Canal's neutrality. The treaties were signed on 7 September 1977 by Presidents Carter and Torrijos at the Organization of American States. After months of heated debate, the United States Senate passed the two treaties in March and April 1978, each by a vote of 68 to 32, drastically changing American military and political influence in Panama.⁷⁹

Implemented on 1 October 1979, the Panama Canal Treaty impacted the United States Army forces in Panama through the immediate turnover of some military facilities, the relocation of other facilities, and the undertaking of previous Panama Canal Company responsibilities. Some facilities at Fort Amador were turned over immediately, necessitating the relocation of U.S. Army headquarters to Fort Clayton. Portions of the former Albrook Army Airfield were transferred in stages to the Republic of Panama, U.S. Army and Air Force flying activities were moved to Howard Air Force Base, and the remaining area was redesignated Albrook Air Force Station. The Department of Defense became responsible for the education, health care, and postal services previously run by the Panama Canal Company. Since 1979, the turnover of

⁷⁸ U.S. Senate, Chronology, 7-9; U.S. House, Panama Canal, 1971: Hearings before the Subcommittee on Inter-American Affairs of the Committee on Foreign Affairs, (Washington, D.C.: GPO, 1971), 18, 30-31, 35-37, 114; Knapp and Knapp, Red, White, and Blue Paradise, 54-59; William Jordan, Panama Odyssey, (Austin, TX: University of Texas Press, 1984), 38-49; Coletta, Navy and Marine Corps Bases Overseas, 259-260.

⁷⁹ U.S. Senate, Chronology, 9-36; U.S. Senate, Defense, Maintenance and Operation of the Panama Canal, Including Administration and Government of the Canal Zone -- Hearings before the Committee on Armed Services, (Washington, DC: GPO, 1978), 62-63, 83-84, 139, 164-165, 258-259; Coletta, 260-261; Knapp and Knapp, Red, White, and Blue Paradise, 47; Robert A. Pastor, "The Carter Administration and Latin America: A Test of Principle," Occasional Paper Series, Volume II, Number 3, (Atlanta: The Carter Center of Emory University, 1992), 11-13.

military facilities has continued and will proceed until the expiration of the treaty at 12 noon on 31 December 1999.⁸⁰

U.S. Military Aviation in Panama

World War I and France Field

The outbreak of World War I brought the first pioneering aviation operations to the Canal Zone. As the efficiency of combat aviation progressed during that conflict, it became clear that the U.S. must provide some form of air force for the defense of the Canal. In March 1917, just prior to American entry into the War, the 7th Aero Squadron deployed to Panama to provide aerial reconnaissance capabilities in cooperation with Navy and Coast Artillery forces in the Canal Zone. This first aviation unit consisted of just two officer pilots and 51 enlisted men, under the command of Captain H. H. "Hap" Arnold. Its entire aircraft complement consisted of two Curtiss R-4 observation planes. For the first few months after arrival in Panama, the 7th shifted its operations between a number of Army bases while its new flying field was under development. March found the 7th at Corozal, but it immediately moved to Camp Empire, and then to Fort Sherman by August 1917. In the meantime, development had begun on a new Army air field adjacent to the Navy's air station at Coco Solo. The first preliminary improvements centered around providing an adequate landing surface, which was accomplished by laying a base of crushed coral and covering it with hydraulic fill. Grass was planted over this base by August 1918, at which time flying operations commenced on a small scale. It was not until January 1919, however, that the 7th permanently moved into its new quarters at France Field. After the war, a significant construction program commenced in order to provide permanent facilities for the Air Corps' growing commitment in Panama. Most of the original permanent construction at France Field was completed between 1920 and 1922, including a new flight line with six hangars. Nevertheless, significant problems plagued France Field throughout its existence, centering around its inferior landing surface. Its flying field could not be expanded due to its location. More importantly, the coral foundation was prone to constant uneven settling, which required an inordinate amount of costly new filling and leveling work. It was also rather brittle and could not safely support the ever-increasing weights of new aircraft. Already by the early 1930s, France Field was deemed unsafe for the operation of the large bombers and commercial aircraft of the day. As soon as other airfields were available in the Canal Zone, it became a secondary operation. Eventually, the limitations of its landing surface prohibited France Field's efficient use as an Air Force Base. By late 1949, France Air Force Base supported only a small caretaker detachment. In accordance with Canal Zone Order Number 54, it ceased to be an Air Force installation on 22 August 1960, and its lands were

⁸⁰ De Mena, "History of the United States Army in the Panama Canal Area," 13.

assigned to the Department of the Army, Department of the Navy, and The Panama Canal Company.⁸¹

Early Aviation in Panama

Following the Armistice of November 1917, additional aviation units were assigned to Panama to support the peace-time security efforts of the other service branches. These units joined the 7th Aero Squadron at France Field to form the 6th Composite Group, composed of one observation, one pursuit, and one bombardment squadron and various supporting elements such as air intelligence, photography, and services. By 1924, the Army's air strength in the Canal Zone stood at 57 officers and 623 enlisted men operating 38 aircraft. Despite constant requests for more airpower and a new airfield for Canal defense, little congressional funding support was forthcoming. By 1929, the authorized air complement remained at only 666 men. These men stayed extremely busy, nevertheless, conducting a wide range of missions, not all of which were directly related to their military responsibilities. For example, in the spring of 1923, heavy flooding isolated parts of Costa Rica from the outside world, cutting roads, railroads, and telegraph lines. Until service could be restored, the Army Air Service provided airmail service into San Jose and Port Limon. Air Service flyers also provided emergency transportation in response to a number of medical crises in remote areas of Panama, both for American citizens and Panamanian nationals. This kind of public service activity served to improve relations between the U.S. and its Central American neighbors. In an effort to foster regular commercial aviation service to and from the Canal Zone, a new position was created in 1929 for an advisor to the Governor of The Panama Canal. Air Corps Lieutenant R. T. Zane was the first to hold the position. Pan American Airways, Inc., commenced regular air mail service to and from the Canal Zone in February 1929. The next year, Pan Am began to provide passenger service between Panama, the U.S., and various points in Mexico, Central America, and the east coast of South America. Pan America-Grace Airways, Inc., also began service to a number of cities along South America's west coast. At this time, all commercial air mail, passenger, and cargo services into the Canal Zone employed Army airfields and Panama Canal Department harbors. France Field served as Pan Am's primary flying field until 1936, when commercial service moved to the recently opened Albroom Field, where a more serviceable runway was available.⁸²

⁸¹ Murray, Panama Chronology: U.S. Air Corps & U.S. Air Force, (n.p.: U.S. Air Force South, n.d.), 4-6; Panama Canal Department Historical Section., History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 14-15; Historical Section, Sixth Air Force, History of the 6th Air Force, 1939, 5; "Land Holdings of the Armed Forces in the Canal Zone, 1956," (Quarry Heights, Canal Zone: Panama Area Joint Committee, Headquarters Caribbean Command, 1956), 3-4, 9; "Land Holdings of the Armed Forces and the Federal Aviation Agency in the Canal Zone, (Quarry Heights, Canal Zone: HQ USARSO, HQ USAFSO, and HQ USNAVSO, 1970), 2; Robert C. Sullivan, 24th Wing Historian, Howard Air Force Base, written comments, 7 November 1996, 1.

⁸² Voss, "The Army Air Service," 417-420; Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 93-94; The Panama Canal, Annual Report

Albrook Field

The need for an airfield on the Pacific side of the Panama Canal had become apparent to Army Air Service and Canal Department officials early in the 1920s. By that time, it had been accepted by U.S. military planners that the original threat assessment for Canal defense was obsolete. No longer were naval bombardment and sabotage the only significant threats to the Canal. Rapid developments in naval aviation -- particularly the aircraft carrier and more advanced and efficient carrier aircraft -- made direct air attack on the Canal more feasible. As a result, the air defenses of the Canal Zone had to be upgraded to meet this new aerial threat. France Field was already proving to be too small to accommodate even the slowly growing Air Service presence in the Canal Zone during the 1920s. Its location offered no possibility for meaningful expansion, and its landing surface was already of questionable utility for the larger aircraft in use even at that time, not to mention the new bombers that the Air Service planned to field in the near future. Moreover, because it was situated on the Atlantic side of the Isthmus, Air Service leaders felt that it offered only imperfect defense against air attack from the Pacific side. It was determined, therefore, that a substantial new flying field must be established on the Pacific side in order to provide adequate defense against the growing threat of air attack.⁸³

Requests for needed expansion fell on deaf ears until the passage of the Air Corps Act of 1926. This act temporarily settled the long-running debate in military circles regarding the establishment of an independent Air Force. It stopped short of this reform, but did authorize the formation of the Army Air Corps, and advocated significant expansion for the Army's air arm. The most significant practical impact of the Air Corps Act was the approval of the Five-Year Plan for Army Aviation. This plan called for a doubling of the strength of the Air Corps over a 5-year period, and a corresponding expansion of the Air Corps' ground facilities. Two new installations were authorized in the plan. One was a new primary training field to be located in San Antonio, TX. The other was a new operational flying field on the Pacific side of the Canal Zone. The primary justification for the establishment of this new field was the Air Corps' plan to deploy a new bombardment group to Panama, and France Field's inability to accommodate it. The location chosen for the new field was the old Balboa Fill Landing Field, a rough auxiliary landing field that was then being utilized during the dry season.⁸⁴

of the Governor of the Panama Canal for the Fiscal Year Ended June 30, 1929, (Washington, D.C.: GPO, 1929), 59-61, 77; The Panama Canal, Annual Report of the Governor of the Panama Canal for the Fiscal Year Ended June 30, 1930, (Washington, D.C.: GPO, 1930), 103; Canal Record (1929), 384; Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, (Canal Zone, Panama: Sixth Air Force, n.d.), Enclosure #45.

⁸³ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 301-302.

⁸⁴ Robert Frank Futrell, Ideas, Concepts, Doctrine: Basic Thinking in the United States Air Force, 1907-1960, Vol. I, (Maxwell AFB, AL: Air University Press, 1989), 31-39, 51-53; Maurer Maurer, Aviation in the U.S. Army, 1919-1939, (Washington, DC: Office of Air Force History, USAF, 1987), 191-221; Wesley Frank Craven and James Lea Cate, The

The site of this field had once been a swampy tidal basin, but had been raised over the proceeding ten years by pumping in material from the Canal mixed with water (hydraulic fill), and layering dry material on top. By 1922, a temporary hangar was erected in the middle of the sod field in order to support emergency landing operations. A detachment of pilots from the 7th Aero Squadron, under the command of Lt. Frank. P. Albrook, became the active personnel for this new field, known as the 8th Air Park. In November 1924, it was redesignated as Albrook Field, in honor of the late Lt. Albrook, who had just died following a crash at Chanute Field, IL. When Albrook Field was selected for expansion under the Five-Year Plan, much filling and surfacing work remained before any real construction activities could even begin. The first appropriations for Albrook Field came in FY28, but covered only housing facilities, providing no funding for technical construction. Follow-on appropriations in FY29 addressed this lack, but significant delays in construction resulted from a series of disputes during the planning stage regarding the placement of the flight line. Actual construction on the field did not begin until 1930, and was not completed until 1932 -- five years after initial approval of the project.⁸⁵

Major E. A. Lohman arrived at the expanded field in 1931 with a detachment of the 44th Observation Squadron from France Field, composed of eight officer pilots flying three old O-19 observation aircraft. Their practical duties were mostly limited to towing gunnery targets for the Coastal Artillery. Construction was still under way at this point, and even the official boundaries of the reservation were not finalized until 1932. Since no concrete runways had been provided in the original construction, these men were forced to operate off of the warm-up apron in front of the three original hangars, which were still completing construction when they arrived. With the arrival of the rainy season in 1932, regular flying operations were forbidden due to the extremely poor quality of the landing field, which became a muddy lake during heavy rains. In emergencies, the light O-19s could use the paved warm-up ramp, but this was not employed for day-to-day flying. On 15 October 1932, following improvements to the drainage system on the field, the 78th Pursuit squadron deployed to Albrook from France Field with their P-12 biplanes. At this point, flying operations picked up, and tactical exercises took over from the aerial target

Army Air Forces in World War II, Vol. I. Plans and Early Operations, January 1939 to August 1942, (Chicago: University of Chicago Press, 1948), 29.

⁸⁵ Jerold E. Brown, Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941, (New York: Greenwood Press, 1990), 74, 80, 165; "Hearings, War Department Appropriation Bill, 1929, Part 1," before the Subcommittee of the House Committee on Appropriations, 70th Congress, 1st Session, (Washington, D.C.: GPO, 1928), 325, 459; "Hearings, War Department Appropriation Bill, 1930, Part 1", before the Subcommittee of the House Committee on Appropriations, 70th Congress, 2nd Session, (Washington, D.C.: GPO, 1928), 327-328; "Hearings, Army Construction," before Subcommittee No. 2 of the House Committee on Appropriations, 70th Congress, 2nd Session, (Washington, D.C.: GPO, 1929), 4; "Hearings, Construction at Army Air Corps Posts," before Subcommittee No. 2 of the House Committee on Appropriations, 70th Congress, 2nd Session, (Washington, D.C.: GPO, 1929), 4, 27-28; Albert A. Mittag, "Albrook Flying Field in the Canal Zone," Civil Engineering, Vol. 4, no. 7, July 1934:340-344; Murray, Panama Chronology, pp. 7-8; Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, Enclosures #4, #19.

duties that had dominated previously. Subsequently, the 78th was split into two squadrons, the 74th and 78th Pursuit Squadrons, which were augmented by the 44th Observation Squadron. These three squadrons at Albrook joined others at France Field to form the 19th Composite Wing, which comprised the entire Army Air Corps contingent in Panama. The total personnel strength at Albrook in 1934 amounted to 46 officers and 662 enlisted men, and increased only slowly until the build-up prior to World War II, although the planned squadron of B-10 heavy bombers did deploy to Albrook in the form of the 74th Attack Squadron in 1936. Throughout the period, Albrook Field and the 19th Composite Wing were plagued by insufficient manpower and funding support, and almost no improvements were made to the base itself. The much-needed runway paving project was not even begun until 1937, and was not completed until 1939. Nevertheless, Air Corps personnel succeeded in conducting regular tactical training operations. Perhaps the most important of these training activities were the annual Joint Landing Maneuvers conducted by Army and Navy forces, which served to enhance the readiness of the Canal's defenders, and to illuminate areas in which current defense dispositions were lacking.⁸⁶

Expansion for World War II

It gradually became apparent to Air Corps leaders, through lessons learned during these Joint Landing Exercises, that the air defense of the Canal Zone was growing increasingly inadequate with each passing year. As early as 1934, the Air Corps requested significant expansion of its strength in Panama in order to enable it to defeat possible air attacks. As in the 1920s, rapid improvements in naval aviation made the threat of attack by aircraft carriers more and more potent. In addition, as the long-range heavy bombers of the day became increasingly efficient, the threat of attack by land-based aircraft increased. Moreover, with the expansion of commercial aviation in Central and South America, the airfields from which such an attack might be mounted had become far more numerous. Under the command of Brigadier General Herbert A. Dargue, who assumed command of the 19th Composite Wing in October 1938, important advances were recommended and accomplished in preparing the air defenses of the Panama Canal for war. Dargue examined the preliminary studies on the subject made by students of the Air Corps Tactical School in 1934, and concluded that more attention had to be given to stopping enemy air attack before it ever reached the Canal Zone. Engaging the enemy over the canal would be entirely too late to prevent damage or destruction of this vital strategic asset. Instead, Dargue advocated the establishment of a network of outlying bases from which to detect and intercept incoming air attacks. Modern pursuit aircraft were necessary for such an interception mission, and more bombers were needed to destroy enemy air bases and aircraft carriers before

⁸⁶ Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 75-77, 95-96, Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, Enclosure #8; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 303; Sullivan, written comments, 1.

they could launch attacks. Little, however, was done to improve the situation until after a brief inspection tour by General H. H. "Hap" Arnold -- now Commanding General of the Air Corps -- in May 1939. Immediately following Arnold's departure, plans were approved to substantially expand Air Corps strength in Panama.⁸⁷

In June 1939, this program of expansion finally received congressional approval and funding support. Referred to anachronistically as the Caribbean Air Command Expansion Program, and the Air Force Augmentation Program, this plan for expansion had actually been advocated by the Air Corps since 1935. In that year, the Drum Board, a special committee of the Army General Council, had concluded that American air power lagged dangerously behind that of other world powers, and called for a significant expansion of its combat strength and basing facilities. Seven geographical areas within the continental U.S. had been identified as critical air defense sectors in which should be established a single major airdrome backed by a system of more primitive dispersal fields. The Drum Board identified the Panama Canal Zone and Hawaii as eighth and ninth critical air defense regions, outside the continental U.S. In 1935, Congress had passed the Wilcox Act, which authorized the necessary expansion of the Air Corps' airfield network, but funding was only gradually approved to allow for the authorized building programs. Since the expansion program required an immense increase in the manpower at Albrook, much of the new construction was dedicated to barracks quarters. In addition, a small amount of technical construction was also included for the flight line, and some for the establishment of the Panama Air Depot (PAD) on the east side of the Albrook reservation. Landscaping advice and assistance at expansion Army and Navy posts was done by the landscape unit of The Panama Canal.⁸⁸

As of December 1939, Albrook's personnel strength stood at 77 officers and 1,721 enlisted men. New troops were scheduled to begin arriving in August 1940 at the rate of 150 men per month. No housing facilities were available at that time, so an emergency appropriation of \$400,000 was approved to begin construction of temporary barracks at Panama Canal Department installations to house the expected flow of reinforcements. Plans for the permanent construction quickly passed through the Quartermaster Corps' Construction Division, but after that delays were immediately encountered. As a result, no construction began at Albrook until July 1940 -- a year after the funds had been released, and only a month before the first recruits arrived. While the

⁸⁷ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 301-303; Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 78-86 and Vol. 2, Preparations for War: 1939-1941, 150; Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, 11-15.

⁸⁸ Brown, Where Eagles Land, 95-98; Futrell, Ideas, Concepts, Doctrine, 67-68; Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 17; Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, 19-21; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 309; The Panama Canal, Annual Report of the Governor of the Panama Canal for the Fiscal Year Ended June 30, 1940, (Washington, D.C.: GPO, 1940), 69.

temporary barracks projects helped somewhat to alleviate the inevitable overcrowding as Albrook's manpower rapidly expanded, housing remained a real problem at the base until well into the war. Many new arrivals were forced to go without proper quartering, with the majority being housed in one or two of the hangars and in tent camps. It was not until early 1942 that the permanent housing facilities reached completion, and even then some quartering problems remained.⁸⁹

Howard Field

The increasing limitations of France Field, coupled with larger and heavier airplanes, made the creation of a new airfield a necessity. The justification given for the necessity of a new field had been that the present field was too small for the operation of modern aircraft, the coral surface couldn't support the new planes, and the coral surface by its constant sinking made maintenance unreasonably expensive.⁹⁰

As early as 1937, the Fort Kobbe Military Reservation had been selected as the site for the future air base. The \$50 million appropriation for upgrading Canal defenses provided the funding to create the new facility, and plans were made definite on 12 July 1939. The Quartermaster General began drawing up specific plans, upon completion of which construction could begin. The development of Howard Field encountered the same contractual delays as other Panama Canal Department projects, and the designs for the hangars were altered, causing a delay of many months.⁹¹

Plans for personnel were more advanced, as there was little time to waste. The new air base was needed quickly, as existing plans indicated an increase from the August 1939 level of 63 officers and approximately 1,390 enlisted men to 140 Air Corps officers and 4,000 Air Corps enlisted men (by 225-man monthly increments) by June 1940. A September 1940 estimate included plans for stationing at Howard Field the Headquarters and Headquarters Squadron of the Panama Canal Air Force and the 19th Bombardment Wing, the 6th and 9th Bombardment Groups, the 59th Bombardment Squadron, the 7th and 44th Reconnaissance Squadron, and the 16th Air Base Group. It was estimated that the above units would house 3,198 enlisted men and 413 officers.

⁸⁹ Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 2, Preparations for War: 1939-1941, 34, 46, 50; Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, 19-21; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 312-313, 316.

⁹⁰ Historical Section, Sixth Air Force, History of the 19th Wing, A.C., 1 January 1940 - 20 November 1940, (Canal Zone, Panama: Sixth Air Force), 35.

⁹¹ "Hearings Before the Subcommittee of the Committee on Appropriations, House of Representatives, Seventy-Fifth Congress on the Military Establishment Appropriation Bill for 1939," (Washington: D.C.: GPO, 1938), 476. Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, 19-20.

The new arrivals were quartered in temporary facilities at Rio Hato air field until the housing facilities at Howard were ready to be occupied.⁹²

General Netherwood, Commanding General of the 19th Bombardment Wing, established priorities in March 1941 for the occupation of Howard Field. No troops were to be transferred until the construction of permanent facilities had advanced to the point where continuing construction work would not impede the mission of the base. The Air Base Group, Headquarters Squadron of the 19th Bombardment Wing, and several service detachments were considered first priority. Next would be the 9th Bombardment Group and the 59th Bombardment Squadron, currently at Rio Hato. These would be followed by the 6th Bombardment Group and the 7th and 44th Reconnaissance Squadrons. The 16th Air Base Group arrived from France Field on or about 5 May 1941, and General Netherwood took command of the Howard Field-Fort Kobbe Military Reservation on 15 May 1941.⁹³ On 20 June 1941, the status of Fort Kobbe was changed from being a sub-post of Fort Amador to an independent post containing Howard Field. The Base Commander of Howard Field became Post Commander.⁹⁴ Shortly thereafter, other troops to be stationed at Howard Field began to arrive:⁹⁵

Four companies of the 550th Airborne Battalion on 1 July; units of the 501st Parachute Battalion on 7 July; the 44th Reconnaissance Squadron (from Albrook) on 8 July; six days later the 74th Bombardment Squadron, also from Albrook; early in August the 46th Signal Platoon, the 325th Signal Company, to be followed sometime later in the month by the 59th Bomb Squadron (L) from Rio Hato; in October the 10th Quartermaster Company, and late in November the 7th Reconnaissance Squadron.

Growing tensions in Europe and the Far East spurred a rapid modernization and expansion of the 19th Composite Wing's aircraft complement, and contributed to a series of organizational changes in the air defense of the Panama Canal. To shift the defense focus from attacking a hostile force from the few ground installations in the Canal Zone to one of regional defense, it was necessary to radically expand the geographic reach of the air defense. As outlying bases were acquired and developed, the Air Force was repeatedly reorganized to maintain efficiency in

⁹² Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, 1, 3, 23; Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, 20 November 1940 - 8 May 1941, (Canal Zone, Panama: Sixth Air Force, 1944), Enclosures #56, #57.

⁹³ Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, 20 November 1940 - 8 May 1941, 45, 47.

⁹⁴ Johnson, American Legacy in Panama, 42; Dolores De Mena, The Era of U.S. Army Installations in Panama, (Fort Clayton, Panama: History Office, Headquarters, U.S. Army South, 1996), 181.

⁹⁵ Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, 20 November 1940 - 8 May 1941, 117-118.

the operation of remote installations. This expansion served to fulfill the mission of the Panama Canal Department Air Force, which was to "detect and defeat an enemy force on the outer rim of the defense arc, or if necessary, to destroy enemy planes which had broken through that arc to the inner defenses of the Canal."⁹⁶

In early 1939, the 19th Composite Wing operated only 28 medium bombers, 14 light bombers, and 24 pursuit planes, plus a few trainers and utility planes. This meager force was clearly not up to defending the Canal in time of war. As soon as the new runway at Albrook Field was completed in April 1939, the obsolescent B-10s of the Wing were replaced with 30 new B-18 long-range medium bombers. In August of that year, following the German invasion of Poland, 30 new P-36 fighters were also sent to Albrook to provide more modern combat aircraft for the defense of the Canal. November 1940 brought a significant air defense reorganization in response to the alarming German military successes of May and June. With the fall of France and German successes in North Africa, new threats developed to the Panama Canal -- and to South America and the Caribbean in general. Direct attack of South America from Dakar appeared to be a real possibility, and Vichy control of French Guiana, Martinique, and Guadeloupe provided even closer bases for the potential enemy. In response, the War Department authorized the formation of the Panama Canal Air Force on 20 November 1940, which took on the task of defending U.S. interests in Panama and in Central and South America. General Frank M. Andrews became its first commanding general. In May 1941, President Roosevelt declared a state of unlimited emergency, and called for accelerated preparations for war. August of that year brought the formation of the Caribbean Air Force -- still under General Andrews as Commanding General, Caribbean Defense Command -- which assumed unilateral command of all Army Air Force and Navy aviation assets in the Caribbean region in order to provide coordinated air defense for the region. This organization assumed command over a much larger geographic area, and included the many new bases throughout the Caribbean that had been acquired from the British through the Lend-Lease program. In addition, troop strength had increased markedly -- as of 11 December 1941, the Caribbean Air Force consisted of and estimated 1,112 officers and 14,974 enlisted men.⁹⁷

A number of new aircraft arrived during the summer of 1941 to supplement the small and aging complement of aircraft already in place. By late August, the 19th Bombardment Wing had 26 B-18's, 21 B-18A's, 9 B-17B's, 12 A-20A's, and 3 A-17's, all destined for Howard Field. The 12th Pursuit Wing at Albrook possessed 64 P-40C's, 2 P-40B's, 11 P-26A's, and 16 P-36A's. In Late

⁹⁶ Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 4, The Reconversion Period 1045-1947, 88.

⁹⁷ Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 303-304, 312, 334, 349; Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, Vol. I, (Canal Zone, Panama: Sixth Air Force, 1945), 1, 261; Murray, Panama Chronology, 14-15.

November, all eight B-17's in the Department were concentrated at Howard Field for more efficient maintenance and operation. The acquisition of these aircraft gave a boost to the Air Force training program, but it continued to be operating at a disadvantage. The rapid escalation of troop numbers meant a high percentage of raw recruits and a serious shortage of experienced officers. The high incidence of station changes interrupted training as logistics had to be restored, and quite often the bases were still under construction, requiring base function work of men who were supposed to be busy with training. Nevertheless, every effort was made to prepare the Air Force for combat situations, and joint exercises were conducted in the autumn of 1941 utilizing the bomber, pursuit, and antiaircraft artillery units for simulated bombing attacks.⁹⁸

World War II

Immediately after the Japanese attack on Pearl Harbor, the War Department instructed its department commanders to put the Rainbow 5 plan into effect. This was the Orange Plan, which identified the Japanese as the primary aggressor, and singled out the Panama Canal as one of the key defense initiatives. General Andrews' requests for immediate reinforcements therefore met with a positive reaction from the War Department, and a number of new units were deployed to Panama as a result. Overall manpower within the Department expanded from about 28,000 men at the close of 1940, to about 31,000 by December 1941, and to a peak of over 66,000 by early 1943.⁹⁹ During the last week in December 1941 the Air Task Force was organized, with oversight of all Army and Navy air assets in Panama and the Caribbean and Pacific naval frontiers. Its mission was to locate, track, and attack any enemy force encountered in these areas. Command was given to the Commanding General of the 6th Bomber Command of the recently formed 6th Air Force. In effect, Atlantic security was left to Navy elements, who concentrated on the German submarine threat, while Army aircraft concentrated around the Pacific approaches to the Canal area. By August, it appeared to military intelligence authorities as though the submarine threat was receding, as the Germans withdrew from the Caribbean to safer hunting grounds in the Atlantic. The reduction of this threat left Atlantic units available for increased patrols in the Pacific sector.

Serving as a bomber and fighter base, Howard Air Base was assigned P-38's, P-39's, and P-40 fighters along with B-17's, B-18's, B-24's, B-25's, B-26's, and A-20 bombers. In order to explore the effects of their tactical abilities, a simulated bombing run on the Howard Air Base runway was conducted in 1942. Explosive charges under one end of the runway were ignited without

⁹⁸ Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, Vol. I, 282-286, 321, 332.

⁹⁹ Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 2, Preparations for War: 1939-1941, 46, 50; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 412.

warning, to see the damage produced and to test the repair crews. The 23-ft diameter crater was filled and other damage repaired within six hours, when the runway re-opened for business.¹⁰⁰

As the threat of attack was beginning to recede, Albrook Air Base began a training mission that continued until 1989. The Air Force School of the Military Training Center of the Panama Canal Department, located at the PAD, opened in 1943 to train Latin American Air Forces. The first class consisted of one officer and ten enlisted men from Peru who signed up for three months of apprentice training.¹⁰¹

In April 1943, the Canal Defense Category was downgraded from "D" to "B" status, with a corresponding reduction in the number of patrol tracks expected to be flown each day. With this development, the Navy split its patrol assets between the Caribbean and Pacific sectors, leaving Army assets free to act as a strike force in time of need. No sooner had this new patrol system come into effect than the Germans began to renew their submarine efforts in the Caribbean and Army assets had to be released to supplement Naval patrols in that area. From November 1943 to April 1944, Army aircraft conducted patrols in support of the Navy, but no combat engagements occurred. Throughout the entire course of the war, in fact, the 6th Air Force engaged in only two combat engagements against German U-boats in the Caribbean, damaging one on 6 July 1942 and sinking another on 22 August 1942. The bulk of its patrol operations were conducted without major contact with the enemy, and the war passed relatively quietly in and around Panama.¹⁰²

Postwar Development

The early years of the postwar period were characterized by sharply reduced budgets and manpower allotments, command reorganizations, and the emergence of the Air Force as a separate branch of the U.S. military. These alterations impacted air defense facilities in the Canal Zone in varied ways, leaving lasting changes.

The huge drawdown of personnel after the war ended resulted in the elimination of units assigned to the Sixth Air Force as airmen were discharged or rotated out. In order to maintain an effective organization over sharply reduced forces, the Sixth Air Force was separated out from the Panama Canal Department, combined with the Antilles Air Command and re-formed as the Caribbean Air Command (CAirC) on 31 July 1946. Operating under the Caribbean Defense

¹⁰⁰ De Mena, *Era of U.S. Army Installations*, 181.

¹⁰¹ A. Glenn Morton, "The Inter-American Air Forces Academy," *Air University Review*, n.d., 16.

¹⁰² Charles Morris, *Security and Defense of the Panama Canal, 1903-2000*, (Balboa Heights, Republic of Panama: Panama Canal Commission Printing Office, 1995), 90-96; Conn, Engelman, and Fairchild, *Guarding the United States and Its Outposts*, 436.

Command, this reorganization placed the air forces on the same command level as the Panama Canal Department. In 1947, the Air Force became a separate branch of the military, but its assets in Panama remained under the umbrella of the unified Caribbean Command. The Air Force divested itself of the many remote bases acquired for the war effort, abandoning some as early as 14 July 1945.¹⁰³

By the start of the next decade, completion of the drawdown resulted in only one active air base remaining. As headquarters of the CAirC, Albrook Field remained active, and became Albrook Air Force Base on 26 March 1948. On 1 January 1950, the CAirC placed France Field and Howard Air Base on inactive status, and transferred all real estate at Howard to the Army for an indefinite period. In 1952, the ongoing confusion over the ownership of Fort Kobbe/Howard AFB led to the issuance on 28 October of General Orders 95. The two installations were officially separated into Army and Air Force property with Fort Kobbe retaining approximately 1,622 acres and Howard Air Force Base encompassing approximately 4,475 acres.¹⁰⁴

During the 1950s, Albrook Air Force Base served as CAirC headquarters and remained the only continental, western hemisphere, active USAF base south of Mexico. In addition to protecting the Canal, training and disaster relief were the primary missions undertaken by the CAirC at this time. Joint exercises were held regularly, and the Albrook Jungle Survival Training School was organized in July 1955. Later renamed the Tropic Survival School, the courses acquainted personnel with the physical and psychological needs for land and water survival. The Latin American training school had been reorganized in 1948 into the USAF School for Latin America (in 1966 the name changed to the Inter-American Air Forces Academy). The School existed to "...provide training in Air Force occupational specialties for personnel of the Latin American Air Forces and provide Spanish translation service for Air Force training publications."¹⁰⁵ Instruction was provided in the students' native languages. In addition to providing training for both U.S. and foreign Air Force personnel, the CAirC also provided many relief missions to Latin American countries hit by natural disasters such as floods and earthquakes.¹⁰⁶

In 1954, Howard AFB was reestablished as an auxiliary airfield, and one year later an Air Force/Army joint agreement allowed regular flying operations to resume at the base. This marked the beginning of Howard's rise to its current status as the primary USAF base in Panama. The air facilities at Howard were used by the Air Force as a jet aircraft training site and terminal.

¹⁰³ Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 4., The Reconversion Period 1045-1947, 90-91.

¹⁰⁴ De Mena, Era of U.S. Army Installations, 170; Office of History, 24th Wing, "History: 24th Wing Howard Air Force Base and Albrook Air Force Station," (Howard AFB, Republic of Panama: Office of History, 24th Wing, 1994), 9; Johnson, American Legacy in Panama, 42.

¹⁰⁵ Morton, "Inter-American Air Forces Academy," 13.

¹⁰⁶ Office of History, 24th Wing, "History," 9-10; Murray, Panama Chronology, 35-41.

The Army used Howard as a landing field for Army aviation in the area. Albrook AFB's location had proved over time to be convenient for personnel but limiting for air operations. Sandwiched in between a range of hills and the town of Balboa, there was no room for runway expansion at a time when larger and more powerful planes required more takeoff and landing area. Never at ease with being directly under the flight path, Balboa citizens began demanding closure of Albrook as early as 1946. By the mid-1950s, pressure for removal mounted, and on 15 December 1961, all USAF flight operations moved from Albrook AFB to Howard AFB. The runway at Albrook continued to be used by the U.S. Army for helicopter and light aircraft. In July 1974, the airfield and PAD area were turned over to the Army and renamed the Albrook Army Airfield. USAF headquarters redesignated Albrook AFB to Albrook Air Force Station on 1 February 1975.¹⁰⁷

The Cuban missile crisis in 1962 refocused attention on Panama as a bulwark of U.S. national security. As a result, funding increased and facilities were upgraded. A program to extend the instrument runway at Howard by 1,500 ft (for a total of 8,500 ft) was begun in January 1963 and finished six months later. The House Armed Services committee approved an appropriation of \$2,842,000 in March 1964 to fulfill construction programs, radar and communications requirements, navigational aids, and airdrome modernization programs at Howard AFB.¹⁰⁸ In February 1963, Howard AFB was designated a ". . . primary installation capable of supporting tactical fighter and reconnaissance operations."¹⁰⁹ On 1 October 1963, the USAF regained control of Howard AFB from the Army, although it was several years before all the housing was back in Air Force hands. In recognition of its expanded role in implementing U.S. foreign policy in Latin America, the CAirC was redesignated United States Air Forces Southern Command (USAFSO) in June 1963. The missions of training, combat readiness, search and rescue, and disaster relief continued under this command, with the addition of counter-insurgency programs. In 1976, command was transferred to the USAF Southern Air Division, and in 1989 this command became the 830th Air Division. Redesignated in February 1991 as Air Forces Panama, the command continued for a year, until the 24th Wing was designated as the ranking air unit in Panama, soon serving under the Air Combat Command activated on 1 June 1992. During the 1970s and 1980s, the USAF in Panama remained busy supporting U.S. foreign policy regarding the political upheavals in many Latin American countries.¹¹⁰

Signing and implementation of the Panama Canal Treaties had a large impact on Air Force facilities and operations in the Canal Zone area. USAFSO headquarters moved to Howard AFB in 1978. When the treaties were implemented on 1 October 1979, Howard AFB and Albrook Air

¹⁰⁷ Office of History, 24th Wing, "History," 10, 13, 54.

¹⁰⁸ Ibid., 55-56; Murray, Panama Chronology, 59.

¹⁰⁹ Ibid., 11.

¹¹⁰ Ibid., 5, 23, 25, 37-40.

Force Station were classified as Defense Sites. These Sites are the areas, and installations they contain, that U.S. Forces control and Panama permits the U.S. to use for purposes allowed by the Treaties. The PAD area and the Army airfield were transferred to the Republic of Panama on 1 October 1979. The Army units occupying these areas moved their aircraft and maintenance elements to Howard AFB, and their headquarters, motor pool and supply to facilities at Albrook Air Force Station. By mid-1981, all units were consolidated at Howard AFB and Fort Kobbe. All United States Air Force facilities in the former Canal Zone are scheduled for transfer no later than 31 December 1999. By the early 1990s, a drawdown of Air Force personnel had begun in anticipation of the transfer. The primary air mission today involves promoting U.S. interests in and around Latin America by providing, employing, and supporting air power. Activities include counternarcotics activities, search and rescue, disaster relief, noncombatant evacuation, and humanitarian missions. Major units in place at Albrook Air Force Station in 1995 included Special Operations Command-South, 214th Medical Detachment, Department of Defense Dependents Public School System Office, and the Center for Treaty Implementation. At Howard AFB, major units included the 24th Wing (12th Air Force), 1st Battalion 228th Aviation Battalion (Army), and the 61st Military Airlift Group (until 1992). The 24th Wing now operates both Albrook and Howard. According to current plans, Albrook Air Force Station will be transferred to the Republic of Panama by 30 September 1997, with Howard AFB remaining until the expiration of the treaties on 31 December 1999.¹¹¹

Albrook Air Force Station Construction History

By the mid-1920s, rapid changes in the air defense environment of the Panama Canal had convinced Army Air Service leaders that a new flying field on the Pacific side of the Canal Zone was absolutely necessary to ensure the Canal's security. The passage of the Air Corps Act of 1926, and the resulting Five-Year Plan for Army Aviation, authorized the establishment of the new field. The site chosen for this field was the old Balboa Fill Landing Field, which had just recently been redesignated Albrook Field in 1924.

¹¹¹ "Impact of the Panama Canal Treaty on the United States Military in the Panama Canal Area," 193rd Infantry Brigade, Public Affairs Office, Public Information Paper, n.d.; Office of History, 24th Wing, "History," 5, 22, 35, 36; De Mena, Era of U.S. Army Installations, 170-171; William R. Evinger, Directory of U.S. Military Bases Worldwide, (Phoenix: Oryx Press, 1995), 268-269; Sullivan, written comments, 2.

The Balboa Landing Field

Albrook Field occupies a shallow valley that runs northeast-to-southwest from the western edge of Panama City to the eastern bank of the Canal. The site was originally a swampy, alligator-infested run-off basin for the Rio Grande and its three tiny tributaries -- the Maria Sala, Curundu, and Quebrada Plata rivers. Between 1912-1913, the Canal Department constructed a dike across the mouth of the Rio Grande to prevent flooding at high tide. The resulting swamp became a serious malaria hazard, and since the Dredging Division needed a place to deposit spoil from the Miraflores Locks project, this swampy area was selected. By 1915, the Dredging Division brought the original hydraulic fill project to completion, but it would only be the first of many. In 1922, the Air Service began to explore the possibility of employing the site as an auxiliary landing facility for the 6th Composite Group at France Field. A contract was let to the Al Geddes construction company of New York to make a dry fill of the area and level some small hills and other obstructions on the field. Three to 5 ft of dry fill were added on top of the hydraulic base, and Bermuda grass was planted in an effort to drive out the native grasses, which tended to clump and produce small hummocks that interfered with flying operations. Upon completion of the dry fill, a single temporary hangar was erected in the middle of the field, along with a simple fuel storage facility. A small group of pilots from the 7th Squadron under the command of 1st Lieutenant Frank P. Albrook was directed to establish the 8th Air Park at the new Balboa Fill Landing Field. This field then began to support emergency landing and take-off operations during the dry season, but was unusable during the rainy season due to excessive flooding and slow drainage. On 11 November 1924 the Balboa Fill Landing Field was redesignated as Albrook Field.¹¹²

Original Construction Program

While the passage of the 1926 Air Corps Act granted the Army initial construction authorization for the establishment of the new Albrook Field, no funding was forthcoming for another two years. During that period, other airfield projects took precedence for the Air Corps' limited financial resources. When funding was finally approved for Albrook, more delays followed during the planning stage as a result of some debate over the placement of the flight line. When plans were finally approved, yet more delays ensued as the original contract bids all came in significantly over the approved appropriation, and the plan then had to be reworked to allow for less expensive completion. Construction actually began in 1930, and most was completed by 1932 when the flying field was finished. Some of the technical construction was further delayed, as two of the hangars remained uncompleted until 1934. Thus the entire construction process, from initial approval to final completion of the flying field, took eight years to complete -- a time

¹¹² Murray, Panama Chronology, 2-3, 7-8; Mittag, "Albrook Flying Field in the Canal Zone," 340.

span that compared very unfavorably with the 3-year average that might be expected in the continental U.S.

The original funding appropriation for Albrook construction passed through Congress in 1928, as part of the Army's construction program for FY29. This appropriation called for \$1.9 million to be expended on a dispensary, barracks for 634 enlisted men, and married housing quarters for 90 NCOs and 71 officers. No funds were provided for technical construction at this date. Later that same year, this lack was made good through further appropriations for FY30 construction, which provided \$1.5 million for the construction of hangars, field shops and warehouses, Headquarters and Operations buildings, radio buildings, an armament and parachute building, gas and oil storage facilities, and improvements to the flying field. A supplemental appropriation of \$274,000 for FY30 provided funds needed for the construction of an NCO Club, Officers' Mess, guard house, garage, quartermaster warehouse, theater, gymnasium, Post Exchange, fire station, and magazines. In addition, \$51,000 was earmarked for the completion of a warm-up apron in front of the hangars.¹¹³

A series of potential plans for the construction campaign at Albrook was submitted by the Department Engineers in early 1928, and by May Plan D was adopted. A dispute immediately began between the Engineering office and members of the Air Corps planning staff over the siting of the hangars along the flight line. The Air Corps officials insisted that the southern three hangars of the plan be removed to the south to allow for the longest possible east-west approach to the flying field. By early 1929, the dispute had been resolved and Plan J was adopted and approved by the Engineers. This plan called for six double-hangars, the southern three of which were to be separated from the northern three to allow for the desired approach path. The number of hangars was later amended to four for reasons of economy. Four large barracks were laid out in a shallow crescent plan to the west of the flight line, with space left for the addition of a fifth barracks when funding allowed. Married Officer and NCO quarters were divided into two general sections, with the officers' quarters situated along what are now Dargue, Hazelhurst, and Canfield Avenues, and NCO quarters situated along what are now Hall and Hanson Streets and Sempsey Circle. In 1929, a contract was let to the Panama Canal Company for the hydraulic and dry fill operations necessary for the resurfacing of the flying field, and work began immediately. Original bids from a great number of American contractors for the building construction projects were opened in October 1930, but all exceeded the Congressional appropriation, and were rejected. The construction plan was then revised to allow for less expensive construction materials, although no reductions in the scope of construction were approved. New bids were submitted by November 1930, and the resulting contracts divided the work between three different companies. The J. A. Jones Construction Co., of Charlotte, NC received the contract

¹¹³ "Hearings, War Department Appropriation Bill, 1929," 325, 459; "Hearings, War Department Appropriation Bill, 1930, Part 1," 327-328; "Hearings, Army Construction," 4; "Hearings, Construction at Army Air Corps Posts," 4, 27-28.

for the construction of all barracks, quarters, utilities, and the hangar and shop foundations. J. W. Patience received the contract for the erection of the hangars and shops. Tucker T. McClure was selected for the construction of aprons, roads, and ramps.¹¹⁴

The Panama Canal began work on the flying field in 1929, and proceeded rapidly thereafter. The project called for hydraulic fill varying in depth from 2- 6 ft over the entire field. This fill was obtained from the Canal prism, and amounted to some 1.2 million cubic yards of material. Additional dry fill to a depth of 1 ft was then authorized for certain areas to support aprons, runways, hangars, and shops. These filling operations were all completed by early 1931. By that time, the two small rivers that flowed through the Albroom reservation were also directed through underground culverts. A system of drains and culverts was then emplaced throughout the flying field to allow for rapid drainage during tropical storms. These efforts improved the field's ability to operate in adverse weather, but even then significant delays were experienced after heavy rains. The nature of the filled land on which Albroom was situated continued to present a source of difficulty. Having been applied in three different efforts, the field experienced a constant uneven settling, resulting in pocket depressions that filled with water and required far too long to drain and dry. This constant settling action left the field very uneven -- even exposing drain covers at times, which posed particular hazards to landing operations. The drainage system was fine for continental U.S. precipitation levels, but was completely inadequate for tropical conditions. After heavy rains, the field required days to dry out before it could be used again. As early as 1931, Major General Preston Brown, commanding general of the Panama Canal Department, stated that concrete runways placed in the direction of the prevailing winds would be absolutely necessary for safe, reliable, efficient aircraft operations from Albroom Field. This improvement, however, was delayed for many years due to funding shortages, and was finally completed only in 1939. Even with this artificial surface, in fact, yearly settling produced many maintenance and repair problems, which eventually played a large role in the decision to abandon the field in favor of Howard AFB in 1961.¹¹⁵

The constructing contractors arrived on site in 1930 and commenced work as soon as the state of the filled land allowed. The four original enlisted men's barracks (Buildings 800, 802, 803, 804) began construction in 1930, and were completed by 1932. Buildings 800 and 803 were

¹¹⁴ Brown, Where Eagles Dare, 165; Murray, Panama Chronology, 8-9; Mittag, "Albrook Flying Field in the Canal Zone," 342-344; "Hearings, War Department Appropriation Bill, 1930, 427-428; "The Panama Canal, Annual Report, FY30, 36; "Army Rejects All Bids on Albroom Field," The Panama American, 23 October 1930; "Reject All Bids or Albroom Field Job," The Star and Herald, 23 October 1930; "Albrook Bids To Be Opened November 29," The Panama American, 20 November 1930; "Jones Co. Gets Contract for Albroom Field," The Panama American, 30 November 1930.

¹¹⁵ Mittag, "Albrook Flying Field in the Canal Zone," 340-341; Murray, Panama Chronology, 9; Panama Canal Department Historical Section, History of the Panama Canal Department, Vol. 1, Introduction and Historical Background 1903-1939, 95-96; The Panama Canal, Annual Report, 1930, 36; Historical Section, Sixth Air Force, History of Albroom Field: Introduction, 1931-1938, Enclosures #4, #19.

constructed according to Standard Plan 3301-1, for 110-Man Air Corps Barracks. Buildings 802 and 804 were constructed from Standard Plan 3302-1, 200-Man Air Corps Barracks. All were three stories, and featured rectangular floor plans on concrete pier foundations, concrete stucco walls, and gable-on-hip tile roofs.¹¹⁶

The married Officers Quarters also began construction in 1930, and were completed by 1932. There were four Field Officers Quarters constructed according to Standard Plan 3214-1 (Buildings 2-5), and 32 Company Officers' Quarters (Standard Plan 3215-1, Buildings 7-12, 15-18, 20, 22, 24-43). The Officers Quarters maintained the installation's predominant structural elements and architectural style. All 31 of the married NCO Quarters (Standard Plan 3216-1, Buildings 200-230) were finished in 1932, on schedule with the rest of the housing units, and featured structural elements and architectural style similar to the Officers Quarters. The primary difference was that they were intended to house two NCO families in a duplex layout, whereas Officer Quarters housed only a single family.¹¹⁷

The Open Mess (Building 13, now the BOQ) was also completed in 1932. This two-story structure featured structural elements and architectural style similar to the Officer and NCO housing units. It included 16 two-room quarters on the second floor, along with a common dining room, library, and billiard room. Servants rooms and a garage originally occupied the first floor.¹¹⁸ The machine shop and warehouse (Buildings 401 and 402) were constructed according to the Quartermaster Corps Construction Division's Standard Plan 695-250.¹¹⁹

Only three of the four planned hangars were actually constructed, due to funding shortages. Contracts were not let for Hangars No. 2 and 3 (Buildings 445 and 446) until early 1931, as additional filling work had to be completed before construction could begin, and extra time allowed for settling. Hangar No. 1 (Building 444) began even later in 1931, because special drainage facilities had to be completed to allow for the diversion of the Maria Sala River which ran directly behind its proposed site. Nevertheless, all three hangars were completed by the end of 1932. These double-hangars were constructed according to an Air Corps standard plan (1930-B Design) that found wide-spread use in the continental U.S. in other expansion projects associated with the Five-Year Program. The hangars were fronted by large concrete warm-up aprons that measured 400 x 150 feet. These aprons were constructed to allow for the simultaneous preparation of an entire squadron of pursuit aircraft, but were also designed to support the weight of a loaded bomber of the type employed by the Air Corps at that time.

¹¹⁶ Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB; Mittag, "Albrook Flying Field in the Canal Zone," 342-344.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ Ibid.

Wheel loadings of the design also called for the aprons to be able to support the weight of a fully-loaded fuel truck, at 7.5 tons. Shortly after their completion in 1932, the two aprons were connected by a 50-foot wide concrete strip, providing an emergency landing area that measured 950 x 50 feet which would remain clear and dry even in adverse weather.¹²⁰

By April 1932, this original construction program was complete. All the necessary housing facilities were ready to accept personnel, and the flight line had received the hangars necessary to support regular flying operations. The field itself still needed a good deal of drainage work to allow for all-weather flying, and the new Bermuda grass surface had yet to be completed in order to keep down the native grasses. Nevertheless, in April 1932, Albrook field was surveyed, its boundaries were marked off as an official Field Reservation, and it was commissioned as an active air field. Active units at this time were the 44th Observation Squadron, the 7th Squadron, and the 25th Bombardment Squadron.¹²¹

Early Improvements

Before other operational units could arrive, more work had to be done to the flying field to allow its use during rainy weather. Besides this field work, little other new construction was accomplished before the build-up prior to World War II. Throughout the mid-1930s, very little funding support was available for expansion of base facilities, and the Air Corps had to make do with what it had. New construction was limited to seven buildings that had been left out of the original construction program. In addition, a good deal of landscaping had yet to be completed, and this apparently posed some real problems. The original personnel at Albrook were having trouble keeping the landscape vegetation alive, as the soil that had been used for fill was infertile. Major E. A. Lohman assigned a set group of numbered palm trees to each officer on base. He told them that they were to guard and tend the trees, and that if any of their trees died, they would be summarily court-martialed. The presence of the thriving palms at Albrook today speaks volumes for the officers' dedication, and perhaps their fear that Major Lohman meant what he said.¹²²

Improvements to the flying field itself were needed as soon as Albrook was commissioned. As early as 1931, the Departmental Commander, General Preston Brown had stated that concrete runways situated in the direction of the prevailing winds would be absolutely necessary in order

¹²⁰ Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, 3, 5-6; Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB.

¹²¹ Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, 3; Sullivan, written comments, 2.

¹²² *Ibid.*, Enclosure #8

to render Albrook Field safe for all-weather flying operations. This request was echoed on a yearly basis by the a succession of Albrook's base commanders, beginning with Major Lohman. These requests met with repeated rebuttals from the Air Corps and the War Department, on the basis that funds were simply not available for the improvement of a newly commissioned airfield. More time was to be given to see if the sod field might possibly be improved enough to allow for efficient flying operations. Some additional improvements were made to the drainage system during the period, but they never successfully corrected the essential flaws in the field that resulted from the constant uneven settling and slow drainage during rainy weather. In the end, it was not until 1938 that Congress approved funding for the construction of a paved runway at Albrook, which was finally completed only in April 1939.¹²³

Better luck was had in securing the construction of other facilities that were needed for the efficient support of flying operations at Albrook. The 1932 Emergency Relief Construction Act identified Albrook Field as one of its beneficiary sites, and subsequent appropriations for new construction at Albrook were obtained in FY33 and FY34, totaling some \$250,000. In 1934, Albrook received two new buildings, including an Air Corps shops building (Building 403) and a Parachute and Armament building (Building 405). The shops building appears to have been constructed from the components of the old temporary hangar that had been placed on the Balboa Fill Landing Field in the 1920s. This structure was a U.S. All-Steel Hangar, a standard type that was erected all over the world by the Army during and after the First World War. The Parachute and Armament building featured concrete, stucco, and tile construction.¹²⁴

In 1935, Albrook received more new construction in the form of a Paint, Oil, and Dope House (Building 406), a Quartermaster Warehouse (Building 407), a Dispensary (Building 865), and a Headquarters and Operations Building (Building 868). These buildings all shared structural and architectural elements similar to the structures of the original construction campaign, with concrete slab foundation, and concrete block walls with stucco cladding. Roofs were the typical clay tile or corrugated metal.¹²⁵

By 1936, commercial air traffic that had utilized France Field began to shift to Albrook, where better landing facilities were available. The brittle runway at France was unable to accept the

¹²³ Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, 4-9; Historical Section, Sixth Air Force, History of the Sixth Air Force, 1939, Appendix C; Panama Canal Department Historical Section, History of the Panama Canal Department, vol. 1, Introduction and Historical Background 1903-1939, 95-96.

¹²⁴ Brown, Where Eagles Land, 94; "Hearings, War Department Appropriation Bill, 1933," before the Subcommittee of the House Committee on Appropriations, 72nd Congress, 2nd Session, 1932, (Washington, D.C.: GPO, 1932), 256; "Hearings, War Department Appropriation Bill, 1934," before the Subcommittee of the House Committee on Appropriations, 73rd Congress, 2nd Session, 1933, Washington, D.C.: GPO, 1933), 818.

¹²⁵ Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB.

weight of the civilian transports that Pan Am operated at the time. One major accident had already occurred when a heavily loaded DC-2 had punched one of its landing gear through the field surface and crashed. In order to alleviate some of the over-crowding on the Albrook flight line that arose from this civilian air traffic, a new hangar was approved to be added to the southern end of the runway, away from the three original hangars. This structure - Hangar 6 (Building 450, Standard Plan 3696-1) - was begun in 1938 and completed the following year. While a good bit larger than Hangars 1-3, this structure resembled them in structural elements and architectural style.¹²⁶

Beyond these minor improvements, intended to fill holes in the original program of construction, essentially no new expansion was approved for Albrook Field during the funding droughts of the Depression era. Not until 1938 did the base even receive its first swimming pool. Even then, Albrook lacked proper recreational facilities such as gymnasias and playing fields. Moreover, Department officials were not confident in the current defense establishment's ability to meet a war-time crisis. Already by 1936, the Commanding General of the Panama Department, General Brown was testifying before Congress that much expansion would be necessary at both France and Albrook Fields to put them in state of readiness for any serious conflict. Significant expansion of housing facilities, in particular, were needed to shelter increasing troop strengths. For the department as a whole, Brown called for appropriations of \$5 million over each of the next five years to bring them to a state of meaningful readiness, and the two flying fields presented the most pressing needs in his opinion. Such repeated requests for the expansion of the Army's air arm in Panama fell on deaf ears during the Great Depression, but began to receive more serious consideration in the late 1930s. By this time, growing tensions in Europe and the Far East had begun to convince American military and political leaders that some expansion of the defense establishment would be necessary to ensure the security of the nation during the coming troubles. By 1939, expansion programs that had been approved under the Wilcox Act of 1936 finally began to get under way, and the most significant construction issues for Albrook would no longer revolve around a lack of funds, but rather, would entail questions of how to expend all the available funds fast enough to meet its rapidly growing needs.¹²⁷

¹²⁶ Historical Section, Sixth Air Force, History of Albrook Field: Introduction, 1931-1938, Enclosure #45; Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB.

¹²⁷ "Hearings, War Department Appropriation Bill, 1937," before the Subcommittee of the House Committee on Appropriations, 74th Congress, 2nd Session, 1936, (Washington, D.C.: GPO, 1936), 645-650.

Pre-war Expansion Program

As the key to the expansion of the Canal defenses was an immense increase in the garrison's manpower, much of the new construction campaign revolved around providing adequate quartering for these new men. In addition to the new barracks and quarters, the plan of expansion for Albrook Field also included some technical construction at the airfield itself. In addition, a substantial project was planned for the east side of the field to establish a new Panama Air Depot (PAD), which was to be relocated from France Field as soon as possible. Since the first wave of new reinforcements was due to arrive in August 1940, it was imperative that construction on the housing facilities begin immediately. Therefore, an emergency appropriation of \$400,000 was passed in late 1939 to allow for the construction of temporary barracks, and the hasty completion of plans for the general expansion program. These plans passed quickly through the Quartermaster Corps' Construction Division, but then encountered significant delays. These delays resulted from two primary factors. First, there was some confusion in Washington over what form the contracts should take. Second, the original plans themselves were flawed, in that they failed at times to take into account the local topography of the base, prevailing winds, and the unsteady condition of the ground on which some of the larger structures were originally located. Moreover, a number of important structures were entirely omitted from the first plan, including an additional hangar, various office and warehouse buildings, and some standard post facilities. More time was lost in modifying the original plan to meet the practical needs of the base. As a result, the contractors did not begin work on site until July 1940 - a year after funds had been released. Some soldier labor was employed in clearing and leveling the construction sites prior to the arrival of the contractors, so that real work could commence as soon as they did arrive. While this did save some valuable time, yet more delays were experienced as a result of the nature of the contracts themselves. These contracts were let in late 1939, before the President had proclaimed a state of limited emergency. As a result, they allowed for what would later appear to be an excessively long period for the actual construction work. None of the contracts were due to be completed before early 1942. While all the projects met the contracted deadlines, these deadlines themselves had become drastically out of date as the war progressed, and the U.S. was thrust ever closer to the brink of open conflict. In the meantime, serious housing shortages remained at Albrook, with new arrivals being quartered in hangars and tent camps where necessary.¹²⁸

The construction program at Albrook fell into five main elements: 1) Enlisted men's barracks, 2) NCO quarters, 3) Officers' Quarters, 4) airdrome improvements, 5) the PAD project. The nine

¹²⁸ Panama Canal Department Historical Section, History of the Panama Canal Department, vol. 1, Introduction and Historical Background 1903-1939, 17, vol. 2, Preparation for War 1939-1941, 34, 46, 50-51, and vol. 4, The Reconversion Period 1945-1947, 85-93; Historical Section, Sixth Air Force, History of the 6th Air Force, 1939, 19-21; Conn, Engelman, and Fairchild, Guarding the United States and Its Outposts, 309, 312-313, 316.

permanent barracks included in the plan were joined by a number of temporary barracks which were thrown up as quickly as possible to accommodate the flood of in-coming recruits. Such was not the case for officers and NCOs, however. When the plan was produced, peace-time conditions still prevailed in construction and housing policies, so adequate quartering for officers still entailed permanent, high-quality housing for the officer and his dependents. Seven general plans were adopted for Officer and NCO quarters, both one and two-family units, all with reinforced concrete construction, stucco walls, and tile roofs. Of course, with the evacuation of dependents in late 1941, these units were actually made to house up to six officers under war-time conditions.

Airdrome improvements included one new hangar, an improved and expanded warm-up apron, concrete taxiways to connect the apron to the recently paved runway, and more improvements to the drainage of the field itself. The PAD project called for about \$2 million worth of new construction on the east side of the Albrook reservation, across the field from the existing flight line. The project stemmed from a long-standing Air Corps request to establish a new air depot in Panama to replace the old facility at France Field. France's depot had received essentially no improvements since World War I, and had fallen into disrepair. A complete reconstruction would have been necessary to allow for efficient support of modern aircraft, such as the new heavy bombers that were planned for Albrook Field. Since there was precious little room for expansion at France Field, and constant problems had been experienced in regard to its landing surface, it was determined that the new depot should be established at Albrook Field, across the landing field from the main flight line. Air Corps planners intended to civilianize the Depot to a great extent, reasoning that the use of military technicians in Panama was inefficient because the standard tour of duty was too short to allow much service time after training was completed. Therefore, the plan for the PAD included 50 units of civilian housing in addition to 16 officers' quarters for the military supervisory personnel, and the shops and warehouses that made up the technical buildings of the depot itself. This plan was very quickly expanded to include 350 low-cost housing units to accommodate a greater proportion of its civilian employees. All of these civilian quarters were pressed into service as officer and NCO housing following America's entry into World War II, as all civilian employees were returned to the U.S.¹²⁹

¹²⁹ "Hearings, War Department Appropriation Bill, 1940," before the Subcommittee of the House Committee on Appropriations, 76th Congress, 1st Session, (Washington, D.C.: GPO, 1939), 246-247; "Hearings, War Department Supplemental Appropriation Bill, 1940," before the Subcommittee of the House Committee on Appropriations, 76th Congress, 1st Session, (Washington, D.C.: GPO, 1939), 116-117; "Hearings, War Department Appropriation Bill, 1941," before the Subcommittee of the House Committee on Appropriations, 76th Congress, 3rd Session, (Washington, D.C.: GPO, 1940), 325-327; "Albrook Field, Canal Zone, Facilities," on file in the Office of the Historian, 24th Wing, Howard AFB, Republic of Panama, 1-3; Historical Section, Sixth Air Force, History of the 19th Wing, Air Corps, 1 January 1940 - 20 November 1940, 26-34; Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, 96, 101-102.

Crucial to the expansion program were the nine permanent enlisted men's barracks (Buildings 801, 805-812) that were intended to house the growing numbers of in-coming personnel at Albrook. Eight of these structures were arranged in two even rows west of the flight line along what is now Andrews Boulevard, while the ninth was placed in the gap that was left in the original 1932 barracks row. All nine buildings were designed as 150-man units (Standard Plan 12301-1), and featured the standard concrete walls, stucco surfacing, and clay tile roofing. Contractors experienced only a minimum of delays in their completion, resulting from the buildings having been sited on the lowest portion of the Albrook reservation. This meant that more time had to be given for the foundations to settle before work could begin on the ground floors. The first foundation pilings were laid in May 1940, and the first barracks (Building 806) was completed in mid-1941. The rest were ready to accept occupants by early 1942, with the last to reach completion being Building 801. In the meantime, a number of temporary barracks were erected to house troops on an emergency basis, with four reaching completion behind the original 1932 barracks in April 1941, and one more a month later. None of these temporary barracks remain today.¹³⁰

The 182 new Officer and NCO quarters were sited in four basic groupings on the northwest side of the field. One small group lies immediately to the north of the old 1932 NCO development, along what are now Cirrone Circle and Hall Street. Another small group lies immediately to the east of the old Officers row, along what is now Dargue Avenue. One large group lies to the north-west of the 1932 developments, along what are now Hall, Abernathy, Morgan, and Holbert Streets. The last large group lies to the north of the 1932 developments, along what is now Canfield Avenue and its side streets - Evans, Clark, Davis, Gardner, Dawson, Porter, Harrington, Edward, and King Streets. Within these four general site groups, the new quarters were constructed according to seven individual - though substantially similar - plans.¹³¹ Four standard plans were used for the Officers' Quarters. One example exists of Standard Plan 625-9445, Single CO Quarters Type 4 (Building 50). There are 26 examples of Standard Plan 625-6315, Single FO Quarters Type 4 (Buildings 63-69, 73-74, 77-81, 87-88, 95-96, 100, 105, 111, 115, 117, 120-121, 130, and 144). Standard Plan 625-6320, Single FO Quarters Type 5 is represented by three structures, Buildings 51, 57, and 60. Seventy-one examples exist of Standard Plan 625-9455, Double CO Quarters Type 6 (Buildings 44-49, 52-55, 59, 61-62, 70-72, 75-76, 82-86, 89-94, 97-99, 101-104, 106-110, 112-114, 116, 118-119, 122-129, 131-143, and 145-147). Three plans were used for the NCO Quarters, with 62 examples of Standard Plan 625-5555, Double

¹³⁰ Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB; "Albrook Field, Canal Zone, Facilities," on file in the Office of the Historian, 24th Wing, Howard AFB, Republic of Panama, 1-3; Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, November 1940 - May 1941, 28, 31.

¹³¹ For an architectural description of these standard plans, see the sub-section on "Standard Plans" in the "Architectural Overview" section of this report.

NCO Quarters Type 3 (Buildings 238-244, 249-254, 256-265, 267-280, 282-289, 291-294, 296-300, 302-306, and 309-310). There are 13 examples of Standard Plan 625-5560, Double NCO Quarters Type 4 (Buildings 231, 233, 236-237, 246-247, 266, 281, 290, 295, 301, and 307-308), and five examples of Plan No. 625-5580 Double NCO Quarters Type 8 (Buildings 232, 234-235, 245, and 248). The last Officers' Quarters was the single General Officer's Quarters, which was constructed according to Plan No. 12430-1, Special Type 4-Bedroom. Its detached Maid's Quarters and Garage Building followed Plan No. AIO 163-2. All of the quarters were constructed on concrete slab or concrete pier and beam foundations, all have poured concrete or concrete block construction, and all have stucco cladding and clay tile roofing. It appears as though the individual developments tend to be comprised of buildings constructed according to the same plan types, though there are some exceptions. If an imaginary north-south line is drawn across the middle of the installation, Officers' quarters are mostly located to the east towards the airfield, and NCO quarters are found to the west.¹³²

Construction on the new quarters began in November 1940, and proceeded quickly, with few delays. The NCO quarters finished a bit ahead of the Officers' Quarters, as their locations tended to require less clearing and grading. Nevertheless, all of the new quarters were completed on or ahead of schedule, and were ready for occupancy by February 1942. Even with the timely completion of the new quarters, significant housing shortages remained at Albrook throughout the war. This shortage was somewhat alleviated by the construction of new housing connected to the PAD project, but recourse was made to the temporary barracks, hangars (usually Hangar 2), even tent camps until the defense requirements of the Canal Zone began to slacken in 1943.¹³³

Improvements to the airdrome facilities centered on paving and drainage work, but one new double-hangar (Hangar 5) was also constructed at the south end of the flight line, just to the north of Hangar 6. Built according to Standard Plan 3605-1, it featured structural elements and architectural style similar to its counterparts. Ground was broken for Hangar 5 in November 1940, and work proceeded at a rapid pace. By April 1941, its steel framework was already completed. Its hangar space was sorely needed in light of the fact that at least one of the existing hangars, and sometimes two, were filled with incoming recruits who had no proper housing. Moreover, by May 1941, one of these hangars had to be vacated to allow room to store the heavy equipment that was pouring into Panama to outfit the Howard Airfield and the PAD, which were both nearing completion. Hangar 5 was completed by November 1941, and was immediately put

¹³² Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB.

¹³³ "Albrook Field, Canal Zone, Facilities," on file in the Office of the Historian, 24th Wing, Howard AFB, Republic of Panama, 1-3; Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, 20 November 1940 - 8 May 1941, 27-41; Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, 95-116.

to use storing this incoming material, so that the older hangars could resume aircraft maintenance operations. By 1942, an Equipment Repair Building and an Engine Repair Building (Buildings 442 and 443) were also added on the north end of the flight line, an enlarged radio control tower was added to the roof of Hangar 3, a new night lighting system was emplaced, and a new aviation fuel system was completed.¹³⁴

Across the field, work on the PAD also progressed rapidly during 1940 and 1941, although it was not scheduled to be fully functional until June 1942. The first 50 civilian housing units at the PAD area reached completion in February 1941, and were immediately pressed into service as emergency housing for Albrook personnel. Most of the rest of the housing, including some 350 low-cost civilian housing units, were finished by that summer, and were similarly employed for Albrook's growing garrison. Still, none of the hangars or shops buildings were completed before the U.S. entered the war, although the depot function had begun to be gradually transferred from an over-worked France Field as early as September 1941. By mid-1942, work on the PAD area had reached completion, and full-scale air depot operations commenced at that time.¹³⁵

Expansion During World War II

With the 1942 construction campaign completed, Albrook Field had assumed the basic form that it would maintain throughout the war. Relatively little new construction was added during hostilities, despite the fact that some housing shortages remained. One significant construction project involved a 1,000 ft addition to the north end of the runway. Although planning and funding for this project had been discussed as early as 1940, the extension was not completed until 1943. The war passed fairly quietly in Panama, and by 1943, it was already clear that there was very little threat to the security of the Canal itself. Anti-submarine and maritime air patrols continued throughout the war, but no contact was made with the enemy after 1943. At this point, the Army began to demobilize in Panama to some extent, in order to shift assets to theaters in more direct threat. Some attention had been given to Albrook's anti-aircraft defense in 1942, in conjunction with a Department-wide initiative to improve this facet of Canal defense. By January 1943, one additional battery of automatic weapons was assigned to each airfield in the Department. Albrook actually received two batteries, one for the main field and one for the PAD

¹³⁴ Historical Section, Sixth Air Force, History of the 19th Wing, Air Corps, 1 January 1940 - 20 November 1940, 31-32; Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, November 1940 - May 1941, 28, 35-39; Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, 97, 107-108.

¹³⁵ Historical Section, Sixth Air Force, History of the 19th Wing, Air Corps, 1 January 1940 - 20 November 1940, 27-28; Historical Section, Sixth Air Force, History of the Panama Canal Department Air Force, 20 November 1940 - 8 May 1941, 29, 32-34; Historical Section, Sixth Air Force, History of the Caribbean Air Force, 8 May 1941 - 6 March 1942, 96-101.

area. This program was rather short-lived, however, as both batteries were considered superfluous by September 1943, and were removed. The latter years of the war saw the addition of a number of base support structures such as bomb and munitions storage facilities, gasoline storage facilities, concrete aircraft hardstands, a radio station, a chapel (Building 860), a Common Headquarters Building (Building 861), a police station (Building 869), a photographic laboratory (Building 870), and a new sentry house (Building 885). Improvements were also made to roads and sidewalks. These facilities were planned in 1943 and completed by 1944, after which time construction activity was limited to the constant maintenance and upkeep of the field. In late 1943, a new civilian terminal opened on the east side of the field in order to allow PanAm to use the runway without interfering with military flight operations.¹³⁶

Postwar Development

Since Albrook was the only operational airfield in Panama after demobilization, it had to accommodate all Air Force personnel in the Canal Zone. Once again, the provision of adequate housing became a problem. In 1946 Congress authorized funds for the construction of new married NCO quarters to accommodate this increase in personnel. This housing construction campaign was the only substantial expansion at Albrook before the Air Force transferred flight operations to Howard AFB in 1961.

In 1948, 25 new NCO quarters were completed in a small development along Olte Street. Their structural elements conform to the base standard, with concrete slab foundations, concrete block walls with stucco cladding, and clay tile roofing. However, these structures vary considerably from the architectural style that dominates Albrook's other quarters developments as they conform to a standard design that lacks the tropical feel that so dominates the other buildings on base. The only other major construction effort in the immediate postwar period was an additional 1,000-ft runway expansion to the north conducted in 1945-46. A new taxiway was constructed in conjunction with the expansion. By 1951, the runway had been extended an extra 150 ft to the south, thereby reaching its maximum length of approximately 6,850 ft.¹³⁷

¹³⁶ "Albrook Field, Canal Zone, Facilities," on file in the Office of the Historian, 24th Wing, Howard AFB, Republic of Panama, 4; Morris, Security and Defense of the Panama Canal, 62; The Panama Canal, Annual Report of the Governor of The Panama Canal for the Fiscal Year Ended June 30, 1942, 117; Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB; Sullivan, written comments, 1.

¹³⁷ Real Property Records on file at the Real Estate Office, Howard AFB; Record Drawings on file at the Engineering Flight, Drafting Section, Howard AFB; Office of History, 24th Wing, "History," 53-54; Historical Section, Caribbean Air Command, "History of the Sixth Air Force, Caribbean Air Command, October 1946," (Canal Zone, Panama: Caribbean Air Command, 1959), 12; Sullivan, written comments, 1.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural Character: The architectural character of Albrook Air Force Station is dominated by the ubiquitous Canal construction scheme of red and white, with concrete buildings and Spanish tile roofs. Roofs have wide, overhanging eaves, and many have mediaguas (lower floor roof projections) to deflect rain from lower story windows. Numerous windows and screened porches were used for ventilation before the advent of air conditioning. Architectural influences that depart from the Spanish imitations are present in the form of Art Deco, Art Moderne, and International Style details on a small collection of buildings.
2. Condition of the Fabric: Most housing at Albrook is in good physical condition. However, the enclosure of porches and historically incompatible replacement windows have contributed to the slight degradation of integrity of most units. Technical facilities that have retained their original or similar uses, are in generally good condition. The fabric of those that have been subjected to substantially different uses, as well as industrial and shop areas, is fair.

B. Site:

1. General Setting: Albrook Air Force Station is located in a flat open expanse at the bottom of a slight valley between Panama City and the Canal. It is on the east side of the Canal at the Pacific terminus, north of Balboa (Figure 1). The site was originally swamp until 1915, when the Canal Department Dredging Division used it as the dumping grounds for spoil left over from the Miraflores Lock project. The airfield and its nearby technical construction is located on this fill. The installation borders on Gaillard Highway to the west. Canfield Avenue runs north-south through the entire length of the base and intersects with Clayton-Curundu Road, the main thoroughfare to Fort Clayton, at Albrook's north entrance. Housing was constructed north of the flight line on rolling hills. Approximately five housing clusters are situated along Canfield Avenue and Hall Street. The administration, recreation, and service buildings are located between the flight line structures and housing areas.
2. Landscaping, Enclosures: The main entrance to Albrook was relocated from Broberg Avenue to Andrews Boulevard shortly after the base opened. Eight barracks buildings were deliberately constructed in a linear pattern flanking both sides of Andrews Boulevard. The formal Beaux-Arts arrangement here provided a dignified entry to the base. This type of planning did not extend to the rest of the installation however. Terrain

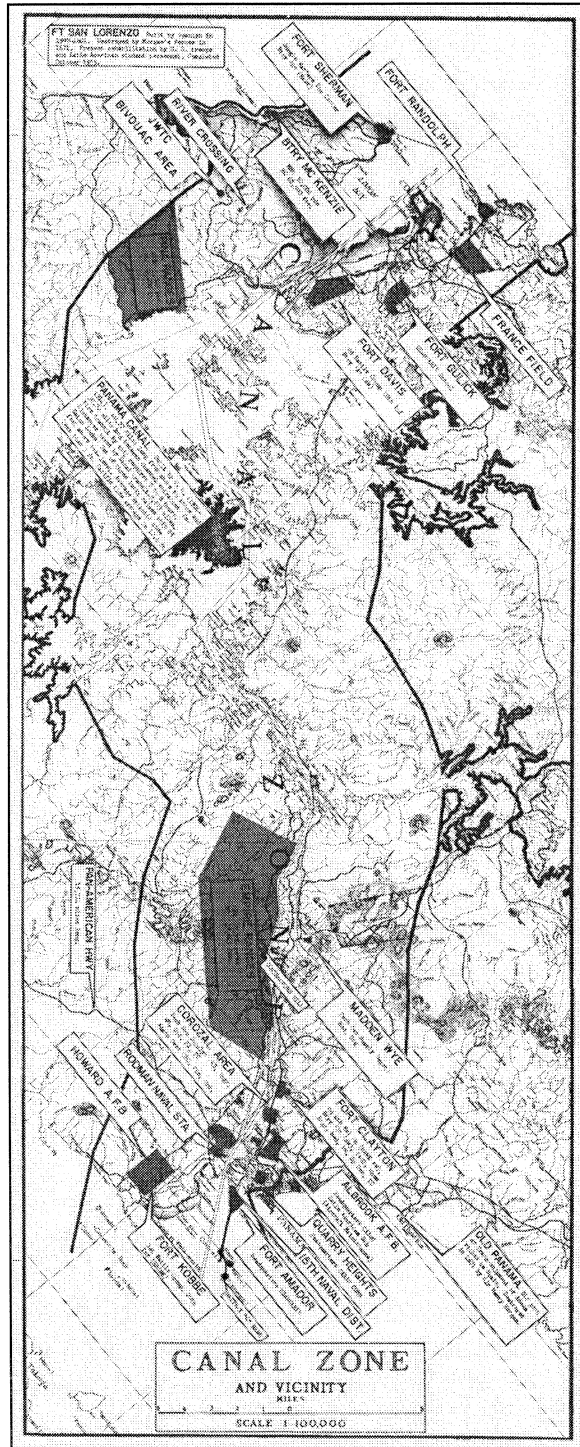


Figure 1. Map of Canal Zone and vicinity. (Source: Directorate of Engineering and Housing, Headquarters, U.S. Army Garrison-Panama, Corozal, Republic of Panama)

in the northernmost sections of the base consist of rolling hills and meandering streets. These areas were cleared of their original vegetation to allow for the construction of housing. Grass was planted, and today mature palms line the major streets of the installation.

3. Buildings: The site contains technical construction near the airfield, including the Parachute & Armament Building (HABS No. CZ-10-D). Some administrative and support structures are also present, including the Dispensary (HABS No. CZ-10-E). There are also residential buildings, including Field Officer's Quarters 2 (HABS No. CZ-10-A), Company Officer's Quarters 29 (HABS No. CZ-10-B), and Non-Commissioned Officers' Duplex (HABS No. CZ-10-C). Many of the remaining buildings are industrial and recreational.

PART III. SOURCES OF INFORMATION

A. Architectural Drawings:

Original drawings and reproductions of original drawings for Albrook Air Force Station are housed at the 24th Civil Engineer Squadron, Engineering Flight-Drafting Section, Building 1, Howard Air Force Base, Republic of Panama.

B. Early Views:

A significant collection of historical photographs was found at the Office of the Base Historian, 24th Wing, Howard Air Force Base, Republic of Panama.

C. Interviews:

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- E. Likely Sources Not Yet Investigated: Research into material at the National Archives would be beneficial.
- F. Supplemental Material: None.

PART IV. PROJECT INFORMATION

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