CHAPTER TWO: THE COMMEMORATION OF THE WRIGHT BROTHERS, 1926-1941

BACKGROUND ON CONTEXT

This context embodies a site-specific theme tied to the recognition of the Wright brothers as pioneers in the development of powered flight and to their unique achievements in the Kill Devil Hills area of the Outer Banks of North Carolina. Links to contexts set out in North Carolina's Comprehensive Planning document are largely indirect. There are some ties to the area of "Public Works; Federal Programs," specifically "Conservation." There is an oblique connection with "Transportation; Air Transportation" and "Engineering; Aeronautical Engineering." The main monument at the site, the Wright Brothers Monument dating to 1931-1933, has further significance for its architecture as an outstanding example of Art Deco style (Division of Archives and History n.d.). The context falls under the National Park Service Thematic Framework theme of "Expressing Cultural Values."

It is important to realize that the Wright Brothers National Memorial is an essentially commemorative site, marking the location and recognizing the achievements of the Wright brothers' work. Contributing historic resources at the site are related to the recognition and interpretation of the Wright brothers' achievements and the preservation of the site at which the experiments of the 1900-1903 period occurred.

The period of significance for the commemoration context begins with the efforts to erect a monument at the site in the late 1920s. It ends in 1941 when the end of public works funding used to develop the park and the start of World War II effectively stopped commemorative development of the site. Following the war, in 1947, NPS developed a new Master Plan for the park that added a layer of interpretation to the site. In addition to commemorating the Wrights' achievements, the new Master Plan called for broadening the unit's focus to include interpreting the brothers' work. Orville Wright's death in 1948 ended an intermittent period of family involvement in the site. The new 1947 Master Plan resulted in a significant shift in the way in which the site was interpreted. The park acquired additional land, dropped many unfulfilled aspects of the earlier plan, and introduced a new circulation system, including a new entrance, trails, and roads for visitors, significantly changing the relationships among features within the site. Beginning with work in the early 1950s, the NPS placed further emphasis on the interpretation of the site through exhibits in reconstructed buildings and a museum, rather than

the commemoration offered by earlier monuments, a direction reinforced by yet another Master Plan in 1965 (Amundson 1987). As a result, during the most recent phase of development, the park continued to emphasize interpretation of the original event over memorialization of the Wrights' achievements.

The area surveyed for this study includes an approximately 431-acre site located north of the resort community of Nags Head, North Carolina, and just four miles south of the community of Kitty Hawk. The history of the site is closely tied to these two communities. The Kill Devil Hill, referred to in the original title of the memorial, is the highest of three one-time sand hills or dunes located just east of Colington Creek and west of the Atlantic Ocean front. The originally sandy site of the Wright brothers' experiments is now sodded and partially covered at the periphery by a variety of shrubs and larger trees, all of which are products of efforts to stabilize the area and to prevent continued erosion, beginning in the late 1920s. The Wright Brothers National Memorial, previously the Kill Devil Hill Monument National Memorial, is located on the west side of state route 158, in the middle of commercial and residential development.

Because of the overall significance of the site, the geographical area discussed in this context extends well beyond the limits of the site itself Reference obviously is made to the growing acceptance in the 1920s, especially, of the significance of the Wright brothers' achievements as well as to parallel interpretive and commemorative efforts of the same period. There is also reference to other federal projects of the era and to expressions of Art Deco style elsewhere in the United States during the same period (as well as to the art movement's partially European origins).

In addition to its significance as the site of the Wright brothers' successful aeronautical experiments, the park is significant for the subsequent commemoration of these events. These commemorative efforts, dating from the late 1920s when local and national groups made the first tangible moves to protect and mark the site, have a significance in many ways distinct from the original event. In 1926 the first bill was introduced in Congress to establish a memorial on the site. A group of New jersey land owners in the area donated a portion of the site to the federal government in 1927. In 1928, the National Aeronautics Association placed the first commemorative marker at the estimated point of liftoff. Between 1930 and 1933 the War Department further developed the site for visitation and supervised the erection of an impressive granite monument at the top of the sodded and stabilized main hill. The NPS assumed responsibility for the monument in 1933. NPS reassessed the purpose and orientation of the site's program, introducing a new Master Plan in 1947, later augmented by a revised Master Plan in 1965 (Amundson 1987). The new Master Plans instituted significant changes at the park, reflecting a change of emphasis from commemoration to interpretation.

Earliest development of the Kill Devil Hills site, beginning in the late 1920s and extending through the 1930s to 1941, provides insights into the growing recognition of the enormous significance of the Wright brothers' achievements. The site of the first flight achieved national and international significance. Efforts to preserve, commemorate, and interpret the Wrights'

experiments represented national acceptance of the brothers' unique contributions to aeronautics and invention.

Early Recognition of the Wrights' Efforts

While the Wrights' success in achieving powered flight on December 17, 1903, received immediate notice, recognition of the full importance of their work arrived more slowly. Following the success of their first flight and three subsequent flights on the same day, the Wright brothers returned to Dayton, Ohio, to spend the Christmas holidays with their family. The brothers telegraphed news of their successful first efforts to their family from the Outer Banks on the first day (Combs 1979:228-31; Howard 1988: 141-45). Their sister Katherine and older brother Lorin acted as defacto press agents, contacting the Dayton *Journal,* whose reporter served as a representative for the Associated Press. Reports contained factual inaccuracies with misattributions of distances, times, and even misspellings of the Wrights' names. Although the Wrights attempted to correct the mistakes, the general public misunderstood the full significance of their efforts for several years (Combs 1979:225-28; Howard 1988: 140-43; Bonney 1962:60).

The Wrights' efforts received a more positive reception from the scientific community. Octave Chanute, another early aerial experimenter and in some ways the Wrights' scientific mentor, understood the full impact of the two Dayton bicycle shop owners' accomplishments. In the spring of 1903, he reported on their flight experiments to the Aero Club of Paris (Bonney 1962:60) and to other interested scientists and enthusiasts. Chanute invited Wilbur Wright to give a preliminary lecture before the June 1903 Chicago meeting of the Western Society of Engineers (Howard 1988:339; Bonney 1962:61). The earliest scientific recognition of the precedent set by their first powered flight occurred in January 1906, when the French journal *L'Aerophile* printed an accurate account of their tests and a description of their 1903 *Flyer.*

Unfortunately, the Wright brothers' need for secrecy over the details of the *Flyer* prevented a more aggressive publicity campaign. In 1902, in order to protect their invention, they applied for a patent on their combined wing-warping and rudder mechanism. The patent was not granted until 1906, the year of the *L'Aerophile* article. In the intervening years they felt forced to keep their original machine and subsequent models out of sight (Wright 1953; Anderson 1985:30; Worrel 1979). They shielded their increasingly successful experiments, conducted near Dayton using a succession of machines and engines, from public scrutiny. During the intervening years they first developed a truly practical aircraft, in the form of the *Wright Flyer III,* a plane that completed a 38-minute flight in 1905 (Anderson 1985:30; Bilstein 1984:63). When they began demonstration flights for the French and U.S. armies in 1908, they brought their work back into public view.

The two brothers immediately realized the military potential of their invention (Bonney 1962: 172). They contacted the U.S. War Department as early as 1905 (Joseph 1962: 119) and made further efforts to interest the U.S. Army the next year (Bonney 1962:63). In frustration they began discussions with representatives of a French syndicate late in 1905 and finally entered into a contract to supply a prototype—the option for which the French group eventually dropped

(Howard 1988: 197-99). Similar dealings with the British War Office also fell through. In 1907, more serious discussions began with the U.S. War Department, and the Wrights embarked upon an effort to meet the prototype specifications of the Signal Corps. Shortly afterward, further negotiations began with the French War Ministry (Howard 1988:225). Testing their final model at Kitty Hawk, North Carolina, in the spring of 1908, the Wrights divided forces for the remainder of the year, with Wilbur traveling to France for trials held at LeMans in August 1908 and Orville undertaking the trials for the U.S. Signal Corps at Fort Myer, Virginia (Kelly 1943; Combs 1979; Howard 1988).

The LeMans and Fort Myer tests received wide acknowledgement as resounding successes. Wilbur continued the trials in France throughout the fall of 1908, taking dignitaries as passengers on demonstration flights and setting new endurance and distance records at Camp d'Auvours and Les Hungedieres (Gibbs-Smith 1970: 133-34; 1963b; 1974a). In December of that year he won the prestigious Coupe Michelin, a 20,000-franc prize for the longest flight to-date in France (Howard 1988:271). Orville gave equally dramatic performances at Fort Myer in early September 1908, with the new *Flyer* setting new records for both single-piloted and passengered flight. Delayed temporarily by an accident of September 17, 1908, injuring Orville and killing his passenger, the Wright *Flyer's* successful demonstrations continued into the following year, when the plane exceeded the Signal Corps specifications and finally made air machines a part of military operations for the U.S. government, with other nations following shortly behind (Bonney 1962:68).

THE WRIGHT BROTHERS' CONTENDERS

By 1909 the Wrights clearly led the world in the piloting and production of airplanes. However, their standing was not universally accepted at the time; indeed, for many years they faced a number of contenders for priority in aeronautics. In the United States, the main competition came from Glenn Curtiss, whose own experiments, including efforts to vindicate the work of the Smithsonian's Secretary Langley, for many years helped obscure the Wrights' own significance (Crouch 1978:37; Gibbs-Smith 1963b; Blines 1968). Curtiss, who began as a mechanic and a motorcycle racer, attracted the attention of Thomas Baldwin and Alexander Graham Bell, both of whom threw support behind him. In association with a group of avid aeronautical enthusiasts known as the Aerial Experiment Association (AEA), Curtiss initiated a series of prototype trials, including the 1908 flight of Baldwin's *White Wing* craft. In the summer of 1908, or before the Wrights' success at Fort Myer and LeMans, Curtiss's own *June Bug* covered a distance of over 2,000 yards in one minute forty-three seconds to win a prize set by *Scientific American* magazine (Hatch 1942; Roseberry 1972; Casey 1981).

In subsequent years, as the Wrights turned to military training and patent litigation over their early inventions, Curtiss became the leading figure in American aviation. His improved machine, the *Gold Bug,* made impressive public flights in New York, winning a second *Scientific American* prize with a flight of 24.7 miles in 1909, around the time the Wrights finally met the Signal Corps specifications in Virginia. Although the Wrights eventually won the rights to their

wing-warping mechanism in court, Curtiss's independent development of the opposite acting ailerons, or flaps, eventually superseded the Wrights' method and pointed to the future of aeronautical control. Finally, Curtiss's development of successful hydro-airplanes or "flying boats" assured his success with the Navy, as that arm of the service moved into air flight after 1910.

Curtiss was not alone as an aeronautical experimenter during this period. In 1911, Calbraith P. Rodgers completed the first transcontinental flight from New York to Pasadena, California, in forty-nine days (Gibbs-Smith 1970: 159). The same year a plane flown by Eugene Ely made news by taking off and landing from the U.S. *Pennsylvania* (Josephy 1962: 134, 150). In Canada, J.A.D. McCurdy, a member of the AEA, made his contribution in 1909 when his plane, the *Silver Dart,* took off from the frozen surface of a lake near Alexander Graham Bell's Nova Scotia estate—the first heavier-than-air flight in Canada (Dwiggins 1969; Bilstein 1984).

The successes of Curtiss and others clouded the Wrights' accomplishments during this period. Curtiss added to the confusion by resurrecting Langley's *Aerodrome* and reconditioning it for new test flights. Langley, a leading figure in aeronautical research in the 1880s and 1890s, corresponded with the Wright brothers during his tenure as Secretary of the Smithsonian Institution. He played a part in the development of the Wrights' interests, if not in the specific design of their own machine (Howard 1988:335-36). Langley developed a series of experimental airplanes in the 1890s, and in 1896 flew a model plane in a circular path for some 3,200 feet over the Potomac River; a second flight reached a distance of 4,200 feet. With a grant of $50,000 from the War Department, Langley also designed a larger aircraft, fitted with an internal combustion engine, which, in model form, managed to make a 1,000-foot flight on August 8, 1903, several months before the Wrights' own successful flight. He attempted a manned flight of the full scale *Aerodrome* on October 7, but it resulted in failure; a second effort December 8 also failed (Oehser 1949: 157-60; Crouch 1978:37; Vaeth 1966; Crouch 1981).

Despite the unsuccessful flights of the *Aerodrome,* many contended that Langley made the main contribution to powered flight up to that point. Even when the Wrights received the Langley Medal in 1910 for their "achievements in aerodynamic investigation and its application to aviation" (Howard 1988:335), some suggested they had only tested Langley's own theories, not developed anything independently (Howard 1988:335). The resurrection of Langley's experimental craft by Curtiss added to the controversy. Curtiss's reconstructed *Aerodrome* of 1914 achieved two brief over-the-water flights and a later sustained flight over Lake Keuka in New York. After the plane was returned to the Smithsonian, the museum labelled Curtiss's reconstructed Langley *Aerodrome* in an exhibit as "the first airplane capable of sustained free flight with a man" a point of great annoyance to the Wright brothers (Oehser 1970: 100). Following Wilbur's death in 1912 of typhoid fever, Orville continued to bear a grudge. It was not until 1948 that the original Wright *Flyer* finally occupied its rightful place in the Smithsonian's collections (Combs 1979:346).

Europeans as well as Americans contested the Wrights' precedence in powered flight (Gibbs-Smith 1974a). While Wilbur's successful demonstrations of 1908 and recognition of the

brothers' accomplishments through the award of the prestigious Legion of Honor medal in 1909 partially cemented their worldwide reputation, there remained serious contenders to the Wrights' claims of priority throughout Europe during the early years of powered flight. In France, Alberto Santos-Dumont coaxed his awkward canard (tail first) biplane into the air for some six flights, one covering 720 feet, as early as 1906 (Wykeham 1962; Da Costa 1973; Gibbs-Smith 1974a). Gabriel and Charles Voisin, flying for their sponsor Henri Farman, remained airborne for more than a minute in 1907; and the development late the same year of Leon Lavavasseur's eight-cylinder, fifty-horsepower Antoinette engine made long duration flight a real possibility for the first time (Gibbs-Smith 1970: 135-40). With Louis Bleriot's and Leon Delagrange's achievements of 1908 and early 1909, European inventors and pilots came closer to matching the heroic efforts of Wilbur and Orville Wright. On July 25, 1909, Louis Bleriot flew across the English Channel for the first time (Gibbs-Smith 1963b, 1970, 1974a). This was merely the first of many milestones and records set by Europeans, and eventually other American pilots, as the Wright brothers settled down to the more mundane tasks of revising and improving designs mainly for military use.

ADVANCES OF THE 1910S AND 1920S

The importance of air flight—and of the Wright brothers' contributions to its development—became dramatically obvious during World War I. As a result of the clear significance of air power, both for covering ground troops and for reconnaissance, the days of independent researchers and friendly prize contests ended. Governments willingly invested huge amounts for aircraft development and production. In 1914, France mobilized some 150 military planes, along with lighter-than-air ships; Germany about 260 aircraft, and 14 zeppelins; Britain fewer than 100 craft (Bruce 1957; Haddow 1962). By the end of the war each of these countries maintained literally thousands of planes. As of 1918, more than 180,000 people in France alone held positions in some aspect of the aircraft manufacturing industry (Gibbs-Smith 1970).

The impetus of World War I resulted in an outpouring of improved aircraft designs. France entered the war with a number of biplanes and monoplanes, most of them developed for racing during the heyday of air competitions during the 1910-1912 period. Early "bird cage" Voisin and Caudron bombers and observation planes gave way to efficient long-range Brequet and Letord day bombers. Single-seat fighters, such as Nieuport and Spad, became the favorites of French, British, and American pilots, proving themselves over the German Fokkers, Pfalz, and Albotros squadrons (Thetford 1954, 1957). By the war's end, the British Royal Flying Corps, originally made up of 150 aircraft and 1,800 men and officers, expanded to 300,000 officers and men and 22,000 aircraft. The U.S. air division, which started with Wright-supplied Signal Corps aircraft in 1917, grew to a force'of 13,000 planes, with orders pending for 52,000 more (Shrader 1953).

The war and its aftermath proved the value of aircraft. During a short-term hiatus as military needs diminished, public interest continued to grow. In 1918, the U.S. Post Office experimented with air-delivered mail. In 1920, the agency inaugurated transcontinental mail service (Josephy 1962; Bilstein 1984). Research during the same period also received official blessing. In 1915

the Smithsonian Institution recommended to Congress the establishment of a National Advisory Committee on Aeronautics (NACA), suggesting further that the committee be authorized to build its own laboratories and test areas. During the next decade, aeronautical research conducted by the NACA at Langley Field in Virginia introduced a significant number of advances. Further support from the Guggenheim Fund and other organizations put the U.S. at the forefront of aeronautical research by the end of the 1920s (Shrader 1953).

The 1920s brought the Wrights some level of recognition for their overall contribution to the development of heavier-than-air flight. By that period, bad feelings resulting from the Wrights' seemingly self-serving patent litigation had subsided, and Americans placed the Wrights' and the country's contributions in perspective. Air flight developed more systematically by the mid-1920s as centralized research operations introduced innovations and encouraged development through interest-grabbing demonstrations and flight records. In 1925, President Coolidge appointed a board to create a national air flight policy (Shrader 1953).

In 1926, the Air Commerce Act, anticipating the development of commercial travel, the Navy's Five-Year Aircraft Program, and the Army's parallel program, contributed further to American aviation development. Other countries made comparable moves, establishing a series of civil and military regulations and controls. In short, governments regularized air flight and development, making the achievements of aerial pioneers ripe for rediscovery and recognition (Shrader 1953; Josephy 1962; Bilstein 1984).

The mid-to-late 1920s also introduced a period of renewed public interest in the capabilities of aircraft and the general potential for air flight. In 1926, Colonel Billy Mitchell, who in 1921 demonstrated the military effectiveness of aircraft through demonstrations off the Outer Banks of North Carolina, gained notoriety when he received a court-martial for insubordination over his insistence that aircraft outmoded many conventional naval operations (Howard and Gunston 1972: 178-79; Bilstein 1983:43). Record-breaking flights, such as Lieutenant A.J. Williams's 266.6 MPH world speed record in 1923 and Lieutenant. J.A. Macready's altitude record of 35,239 feet in 1924, captured the public's imagination, as new craft were developed and old records broken. Long distance flights especially became subjects of interest. In 1925, Italian Commander de Pinedo and his mechanic traveled from Italy to Australia in their single-engine Savoia flying boat, returning via Japan for a record distance of over 30,000 miles. In November of the same year, the British pilot Alan Cobham flew from London to Cape Town via Cairo in a then-astounding time of ninety-four hours. And in May 1926, Commander Richard E. Byrd and his co-pilot Floyd Bennett flew from Spitsbergen over the North Pole and back in their three-engined monoplane the *Josephine Ford* (Josephy 1962; Bilstein 1984).

However, the biggest aviation event of the 1920s, and one that synchronized with the initial development of the Wright brothers' memorial near Kitty Hawk, was Charles A. Lindbergh's nonstop flight from New York to Paris in May 1927, winning Lindbergh the coveted $25,000 Orteig prize and catapulting the young, former airmail pilot into international prominence (Ross 1968). Lindbergh's flight encouraged further long-distance efforts (Ward 1958). In June 1927, Clarence Chamberlain and Charles Levine flew in their Bellanca monoplane from New York to

Eisleben, Germany. The same month, Lieutenants Maitland and Hegenberger (of the U.S. Army flew 2,400 miles from Oakland, California, to Honolulu. In October, the pilots Costs and Le Brix flew the Brequet biplane from Senegal on the west coast of Africa to Rio de Janeiro, establishing yet another first (Bonney 1962; Josephy 1962; Dwiggin 1969; Bilstein 1984).

RECOGNITION OF THE WRIGHT BROTHERS' ACHIEVEMENTS

The increased flight activity of the late 1920s and the burgeoning public and governmental interest in all things connected with air flight led to a new attention to the history of flight experimentation and to recognition of the Wrights' special place in that history. Efforts to recognize the Wright brothers' achievements had both a national and local dimension. The national aspect included the continuing controversy over priority and patents represented by the Wright brothers (and after 1912 by Orville Wright) and their champions on one side, and by Curtiss's and Langley's advocates on the other (Wright 1953; Worrel 1979; Reynolds 1950). At the local level, North Carolinians sought to recognize and protect the site of the Wrights' experiments and to underscore the significance of North Carolina and the Outer Banks to the Wright brothers' seminal accomplishments. Both the national interest, tinged by increasing patriotism as the U.S. reassessed its own contribution to the development of air flight, and the local interest, in part fueled by both pride and regional boosterism, converged at the Kill Devil Hills site to create a monument to both the Wright brothers and to America's important place in aviation history (Bilstein 1983:143).

W.O. Saunders, the outspoken editor of the nearby Elizabeth City *Independent*, originated the movement to recognize the Wrights and to give special attention to the Kill Devil Hills site (Hewes 1967:16). A longstanding champion of Outer Banks causes, Saunders progressively pushed for economic development, pressing for and supporting governmental programs, and otherwise promoted the potential of the Outer Banks. Local landowners and investors, as well as prominent long-time residents, heeded Saunders's call for development of the Banks, with a memorial to the Wright brothers seen as only a part of that development. Important players in these efforts included Frank Stick, a native of New Jersey but a strong advocate of the developmental potential of the Outer Banks (Stick 1970:53), and North Carolina administrators and politicians such as Frank Page of the North Carolina Highway Commission and Dare County native R. Bruce Etheridge, Director of the North Carolina Department of Conservation and Development (Stick 1958:248).

National figures joined local efforts to promote the idea of a Wright brothers memorial. U.S. Representative Lindsay Warren of North Carolina first introduced a bill for a Wright memorial to Congress on December 17, 1926, the twenty-third anniversary of the Wrights' historic flight *(Congressional Record* Dec. 17, 1926). Senator Hiram Bingham of Connecticut, a former World War I aviator, as well as the renowned discoverer of Machu Pichu, the "Lost City of the Incas" in Peru, introduced a similar bill in the U.S. Senate the same day; Bingham was closely tied to the Wrights' cause and played an effective role in establishing the memorial both through his political office and as president of the National Aeronautics Association (Hewes 1967:8;

Bingham 1963). Warren sought the support of Orville Wright, presenting Wright's positive response in a speech to the U.S. House of Representatives. He also separately enlisted the support of the National Aeronautics Association (Hewes 1967:5). As a last dramatic gesture in his presentation to the House, Warren pointed to Frank Stick, Allen Heuth, and Charles Baker's donation of the plot of land at Kill Devil Hills where the Wrights conducted their experiments as reason for creating a memorial *(Congressional Record* Feb. 8, 1927, p. 3282). The act finally passed both houses of Congress and was signed by President Coolidge on March 2, 1927, rewarding the efforts of Warren and Bingham.

The specifics of the Wright Brothers Memorial Act called for the Secretaries of War, Navy, and Commerce to appoint a memorial committee to establish an appropriate site for a commemorative monument and to appoint a second committee to oversee the construction of the monument and plan for its dedication. The standing Commission of Fine Arts and the Joint Committee on the Library received responsibility for approval of the final design and for other plans for the memorial *(Congressional Record* Feb. 8, 1927, p. 3281). Other individuals involved, both formally and informally, in decisions concerning the monument included future President Herbert Hoover, Charles Lindbergh, Cecil B. DeMille, Joseph Pulitzer, Fiorella La Guardia, Commander Richard E. Byrd, General John P. Pershing, and Harry Guggenheim, all of whom joined the Kill Devil Hills Memorial Association, a national and local support group for the project founded August 27, 1927 (Elizabeth City *Independent* 8/19/27).

The supporting organizations played a central role in the realization of a Wright brothers memorial, and their members worked assiduously to both prepare the way for and determine many of the details of the final monument. W.O. Saunders held a key role, organizing the Kill Devil Hills Memorial Association in August 1927 and then pressing for the road and bridge construction required for access to the memorial (Hewes 1967:15-16). Up to the time of the Wright memorial, little real development had occurred on the isolated and economically stagnant Outer Banks (Dunbar 1958; Stick 1958; Bishir 1987). Warren obviously recognized the problem and hoped to draw the Outer Banks into a more sustainable economy (Hewes 1967:3). The proposed Wright brothers memorial, as well as concurrent efforts to develop the commemorative and interpretive site of Fort Raleigh on Roanoke Island near Manteo, played a central role in Saunders's and other local boosters' plans for state expenditures on bridges and highways for the Outer Banks (Stick 1970:53). The Kill Devil Hill Monument National Memorial offered an incentive for tourists to visit the area, and therefore provided a justification for new roads and bridges, including the Wright Brothers Memorial Bridge, planned by a group of Elizabeth City investors, led by local businessman Carl Blades. Completed in 1930, this three-mile-long toll bridge assured the construction and paving of a new road past the memorial (Stick 1958).

BEGINNINGS OF THE WRIGHT BROTHERS MEMORIAL

An important first step in the realization of the Wright brothers memorial occurred on December 17, 1928, when 200 delegates from the International Civil Aeronautics Conference, as well as friends and family of the Wrights and more than 3,000 other visitors, dedicated a granite marker

placed at the approximate site of the 1903 liftoff and laid the cornerstone of the monument to be placed on the largest of the Kill Devil Hills. The National Aeronautics Association (NAA) provided the six-foot-high marker, carved to resemble a boulder and carrying the following inscription on a bronze tablet:

> THE FIRST SUCCESSFUL FLIGHT OF AN AIRPLANE WAS MADE FROM THIS SPOT BY ORVILLE WRIGHT DECEMBER 17,1903 IN A MACHINE DESIGNED AND BUILT BY WILBUR AND ORVILLE WRIGHT.

Identifying the exact location of the flight was problematic because the dunes and hills had shifted considerably over the years following the Wrights' experiments. On November 4, 1928, under the direction of the NAA, Captain William Tate organized a meeting of three of the four surviving witnesses to the first flight to determine the point of takeoff. Using Orville Wright's accounts of the flight, Will Dough, Adam Etheridge, and Johnny Moore identified the approximate location of the first flight takeoff. Tate presented the method of determination at the marker's dedication ceremonies:

> Dough, Etheridge, Moore, and I assembled here and I explained to them the importance of arriving at a definite conclusion with respect to the spot where the Wright brothers' airplane, in making its first successful flight, first began to move along the ground. We

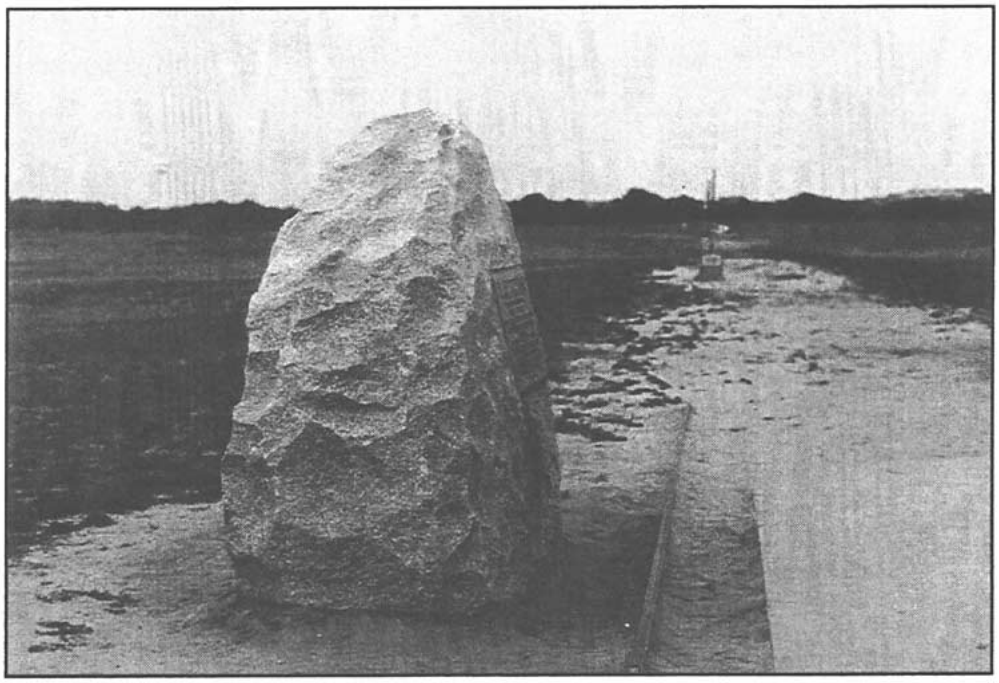


Figure 7 First Flight Marker, 1991

> located the four corners of the building in which the machine was housed . . . . We took into consideration what Mr. Orville Wright said about it in his article How We Made Our First Flight. We had a compass with us and we were sure of our compass course. After considering all these things and talking it over these other three men proceeded by themselves to come out here on this point and select the spot on which this magnificent boulder stands and said that this was the spot where the Wright airplane started its first successful flight. . . .After agreeing upon this exact spot we signed a paper to that effect. . . . (U.S. House, 70th Congress, 2d Session, House Document 520, 1929:23)

The granite marker, obtained at a price of $2,500 and measuring approximately 6 by 4 feet, was placed at the top of a small mound on the spot the witnesses identified with the inscription facing the Kill Devil Hill. By general agreement it has remained the best available indicator of the Wrights' historic takeoff point.

A second memorial, a modest stone shaft, placed around the same time in William Tate's yard about four miles north of the Kill Devil Hills location, indicated the location of the first assembly of the Wrights' first glider (Howard 1988:429; *New York Times* 12/16/28).

While the NAA completed background research on the site and provided the first two memorials, other efforts were made for the main monument. Beginning in the summer of 1928, prior to the unveiling of the granite marker, a joint effort of the Coast Guard and local citizens partially stabilized the large hill at Kill Devil Hills through an encircling band of shrubs and stub grass in order to help prepare the hill for the planned larger monument *(New York Times* 12/18/28; Howard 1988:429-30). This became the first major alteration of the site; the War Department eventually stabilized, planted with shrubs and trees, and sodded the ground, thus altering the once barren scene of the flight forever.

The day before the granite marker's unveiling, the delegates from the International Civil Aeronautics Conference traveled to the site on a steamer. Due to heavy fog, the travelers, including Orville Wright and other family members, spent the night in Norfolk, Virginia, transferring to buses for the final seventy-five-mile trip to the Outer Banks. Reaching the end of the improved roads, the passengers transferred to a fleet of seventy automobiles, which in turn carried them over a system of temporary corduroy and mud roads to the ferry at Point Harbor. At Kitty Hawk they changed to a second fleet of cars, which took them over a new road to a barbecue and turkey lunch near the site. After lunch they made the final trip to the Kill Devil Hills for the unveiling and dedication of the marker. More than 3,000 other spectators, arriving by boat, private car, mule, and pony cart, joined the group at the site *(New York Times* 12/18/28).

W.O. Saunders, Senator Bingham, and Secretary of War Dwight Davis addressed the gathering. After the laying of the cornerstone, the Norfolk Naval Station band played "The Star-Spangled Banner." The crowd then moved down the hill to be near the marker designating the point of take-off in 1903. Orville stood by the well-known aviator Amelia Earhart, barely recognizable in her cloche hat (Howard 1988:430). The boulder was sheathed in a parachute of white silk, which Mary Byrd Saunders and Florence Ballard, both of Elizabeth City,

ceremoniously removed. Simultaneously, a sailor from the Norfolk Naval Station released a flight of fifteen carrier pigeons "which put on a formation of spirals and turns before turning northward toward their home" *(New York Times* 12/18/28). Following another rendition of the national anthem, the crowd dispersed, returning over the next few days in an operation compared by the press to Napoleon's retreat from Moscow, to their *various* homes *(New York Times* 12/18/29).

SELECTION OF THE MONUMENT DESIGN

The placement of the rock-faced marker with inscription initiated the commemorative development of the Wright brothers memorial site. The cornerstone laid at the top of Kill Devil Hill on December 17, 1928, initiated the construction of the principal monument as set out in the 1927 Congressional Act, but the selection of the actual design for the monument remained. All the interested parties immediately disagreed over the monument design and function. The Memorial Commission, established by the act, dealt with all concerns. Congressman Warren expressed hopes "that the plans will call for something grand and artistic which will worthily mark the public recognition of what the achievement signified" *(Congressional Record* Feb. 10, 1927, p. 3281). Another suggestion called for the monument to be combined with a new structure for the lifesaving station at Kitty Hawk, then in disrepair. William P. MacCracken, Jr., the Assistant Secretary of Commerce for Aeronautics, as well as Secretary of Commerce Herbert Hoover, supported this proposal. As Hoover expressed it, he was reluctant to dump "a quarter of a million dollars of public money on a sand dune where only a few neighborhood natives would see it" (Elizabeth City *Independent* 11/18/32). Hoover also suggested a marine light to further the monument's utility (Hewes 1967:29).

The Commission of Fine Arts, retaining the right of final design approval, rejected the utilitarian proposals put forward by the Memorial Commission and Hoover, favoring a purely commemorative structure. Senator Bingham especially expressed his disagreement with the plan that attempted "to combine memory with utility" (Hewes 1967:28). He promoted a Greek temple design, constructed from granite quarried in his home state (Howard 1988:428). Nonetheless, utility ultimately won out. Charles Moore, Chairman of the Commission of Fine Arts, indicated to the Memorial Commission that the final design included "a memorial tower which should carry a powerful light to air flyers... [and] a landing place for planes" (Hewes 1967: 19). While the commemorative airstrip took many years to be realized, the final design included a beacon, though as one of the architects recorded, it was more a memorial with a beacon than a beacon glorified as a memorial (Hewes 1967:34).

Much of this controversy over the design took place in the early part of 1928, before the official unveiling ceremony for the smaller marker and dedication of the cornerstone. By June 1928, the Office of the Quartermaster General, charged with supervising actual construction, realized the impossibility of a quick decision and announced a design competition (Hewes 1967:21). The Memorial Commission appointed members of a jury to select the winning design in accordance with principles established by the American Institute of Architects (Hewes 1967: 27-28). While the jury awaited submitted designs, the Quartermaster General prepared a report

on the site, which suggested that the top of the largest hill at Kill Devil Hills would indeed be a suitable location for the monument. At first thought to be subject to further shifts and erosion, the hill consisted of moist and heavily compacted sand, which could be stabilized as a suitable base. Although selection of the final design was delayed until the early part of the following year, by October 1928 the site was finally agreed upon.

By January 31, 1929, the jury had received a total of thirty-six entries. The jury selected the submission of the New York architectural firm of Rodgers and Poor; and on February 18, 1929, the Commission of Fine Arts concurred, over the objections of Senator Bingham. The Joint Committee on the Library, of which Bingham was a member, held up the decision for nearly another year. On February 14, 1930, the firm of Rodgers and Poor finally received formal notification that their design won the $10,000 prize and that they were to proceed as architects for the construction of the monument (Hewes 1967:34).

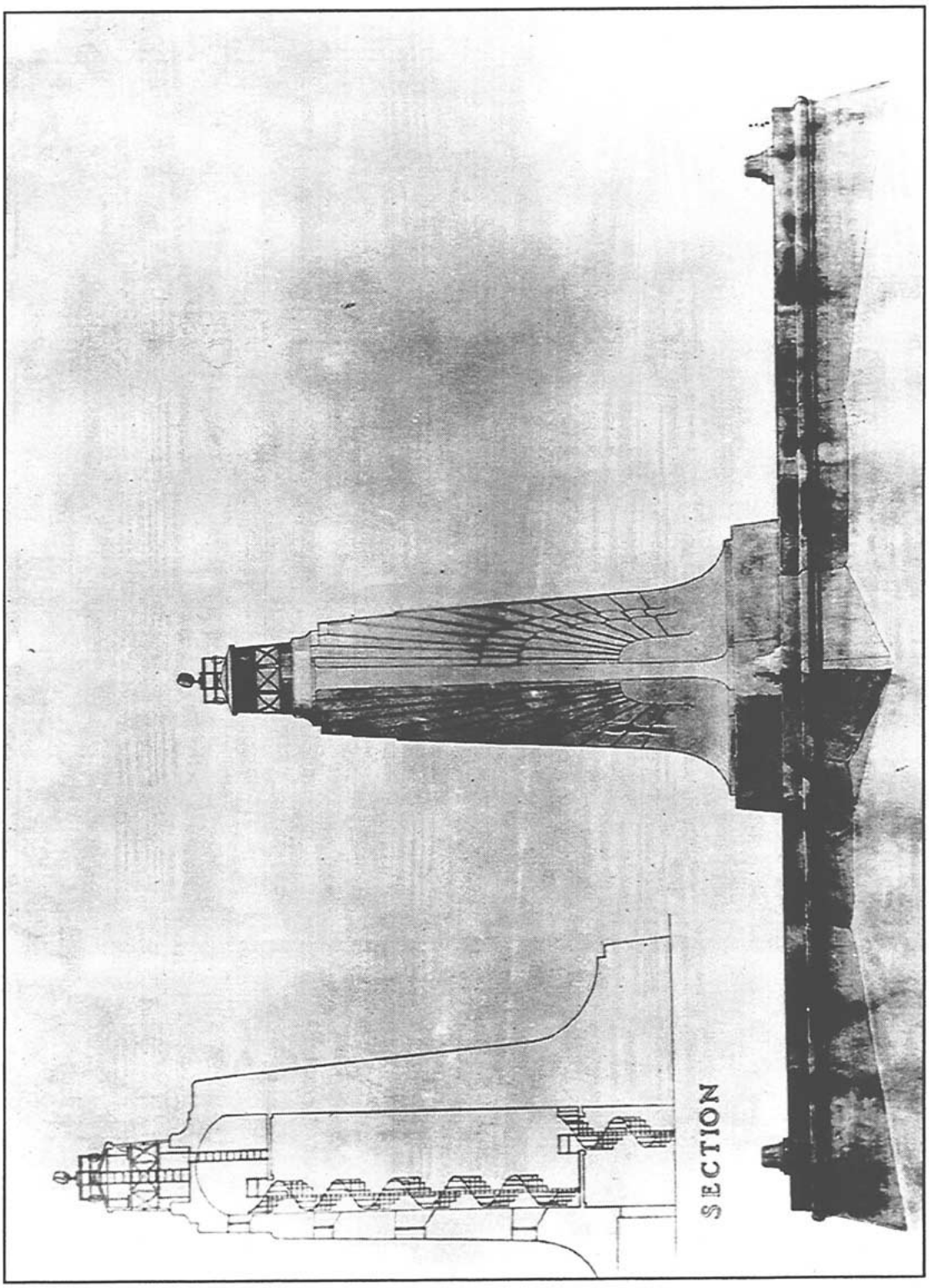
Respected Beaux-Arts-trained architects, Rodgers and Poor were well-suited to the task. Robert Perry Rodgers (1895-1934) graduated from Harvard University in 1917 and served in the Navy during World War I in an Atlantic transport unit. He studied at the famous Ecole des Beaux Arts in Paris, receiving a diploma in 1920. His early training began as a draftsman in Bertram Goodhue's office in New York (Rodgers, Robert Perry 1939).

Rodgers began his collaboration with Alfred Easton Poor (1899-1988) in the late 1920s, working on an office building for Little and Brown Publishers and a private studio on East 78th Street. Poor also attended Harvard, as well as the University of Pennsylvania, receiving degrees in architecture from both. His interests included historic American architecture, and in 1932 he published *Colonial Architecture of Cape Cod Martha's Vineyard, and Nantucket,* still considered a standard work on the topic (Poor, Alfred Easton, Obituary, *New York Times* 1/8/88).

Interestingly, the Rodgers and Poor design was anything but traditional and, in fact, revealed strong ties to the then-popular Art Deco movement—a movement traced to the 1925 *Exposition Internationale des Arts Decoratifs et Industriels* in Paris (Duncan 1988). Few designs of this style existed among federally sponsored buildings; most tended to be more fully in the classical and Beaux Arts tradition (Craig 1984:286). Rodgers and Poor's design gave expression to the "aesthetics of the machine" (Craig 1984:306). Essentially a masonry shaft, about 60 feet high, the monument was embellished with highly stylized sculpted wings on each side to symbolize the ideas of flight and motion. The design implied ancient Egyptian motifs, an important source for Art Deco designs, which also drew upon Native-American and Asian precedents (Duncan 1988:7-8).

The Wright Brothers Monument was a design unequaled by other federal projects of the era, most of which focused on utilitarian functions and character. Among the other more noteworthy projects of the same period were the Arlington Memorial Bridge, the Deadwood Dam, and the Hoover Dam (Craig 1984:32; Wilson, Pilgrim and Tashjian 1986:111). In part to placate Senator Bingham, the commission authorized the architect to give even further embellishment to the building, emphasizing the design features of the memorial more than the functional qualities of

Figure 8 Rodgers and Poor Monument Design Entry, 1929


SECTION

the beacon. Simultaneously, the Quartermaster Corps agreed to construct the monument from North Carolina granite, rather than the concrete proposed by Rodgers and Poor, in deference to Congressman Warren *(American Architect* 37 [1930] 55). Most of the parties involved felt the resulting unique memorial, suffused with the appropriate symbolism and majesty, properly marked the site.

BUILDING THE MONUMENT

Before construction of the monument began, the site required further stabilization and construction of access roads. The Quartermaster General sought an appropriation for the necessary funds to carry out the work with support given by the Secretary and Assistant Secretary of War. In addition to the original $25,000 in preparation and planning money authorized by the 1927 act, the budget now reached a tremendous $277,688, well over the $100,000 originally considered. The War Department allotted some $25,000 of this amount to stabilization work, with leadership assigned to Captain William H. Kindervater of the Quartermaster Corps, appointed inspector of construction on January 16, 1929 (Hewes 1967:26). Kindervater began work immediately. Most of the work involved the planting of grasses and shrubs, an effort presaged by Captain Gould, the caretaker of the nearby Bodie Island Gun Club, who first experimented with the use of dune grasses in the early-to-mid 1920s (Stick n.d. I:16; Copeland 1940:15). Kindervater found that the most serviceable grasses and shrubs were the locally available wire (bermuda) grass; Bitter Tanic, gathered at nearby Virginia Beach; and a range of local shrubs, including yaupon, myrtle, pine, live oak, and sumac, among others. As early as January 1929 he worked out a formula for fertilizer to encourage the growth of vegetation on the shifting sand hills. In April he wrote the Senior Agronomist at the Department of Agriculture for suggestions on "any seed that has a pretty flower ... [in order to] spell out the words Kill Devil Hill in flowers" (Hewes 1967: 30), an idea never acted upon. He also sought to protect the site from "the molestation of tourists and souvenir collectors, and the ravages of wild hogs," and to this end he constructed a wire fence around a portion of the site to prevent animal grazing on the newly planted grass. In August, apparently in recognition of his success, Kindervater received a promotion from inspector to superintendent of construction (Hewes 1967:31).

Kindervater chose a relatively straightforward method for stabilizing the hill and surrounding area. He harrowed the site, loosening sand and soil; spread a two-inch layer of pine straw, rotted leaves, and wood mold; sowed grass seed; and then covered the whole with brush to protect new growth. The area also received heavy fertilization (Hewes 1967:31). The dune withstood storms in 1929 and 1930, justifying the operation. The successful work at the Kill Devil Hills site helped lay the groundwork for the massive dune stabilization project along the proposed national seashore at Cape Hatteras during the mid- to late-1930s (Stick n.d.; Stick 1958; Stick 1970:59).

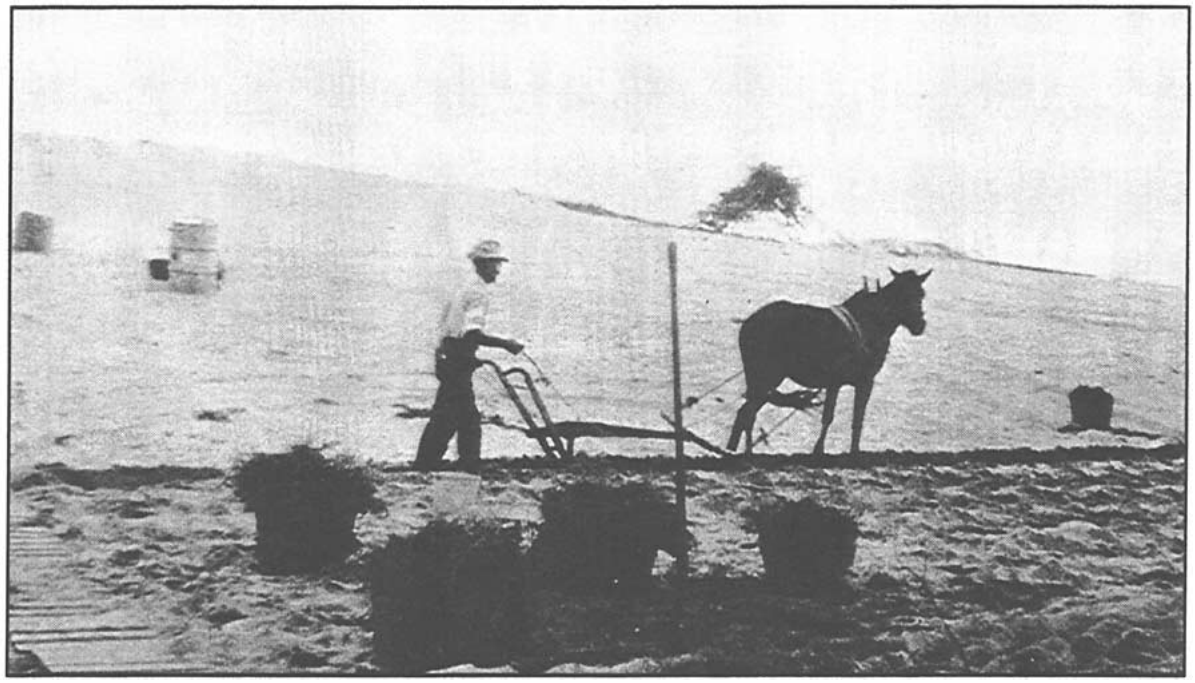


Figure 10 Planting Method, Kill Devil Hill Stabilization, 1930

Figure 11 Wood Mold Application, South Slope of Kill Devil Hill, 1930

Before construction began on the monument, workers improved access by creating a drive from the newly constructed North Carolina Highway Route 158, south of the site. Further roadways planned within the 314-acre reservation included a road forming a semicircle on the east side of the big hill. Other construction was required for part of the old Kitty Hawk/Nags Head road which passed by the site. In the early part of 1931, Congress authorized the Secretary of War to allocate $25,000 for road construction, with the stipulation that Dare County provide maintenance costs. Bidding for the combined sand and asphalt roads opened in February, with construction beginning in April and completed in May (Hewes 1967:38).

Congress confirmed appropriations for the building of the Rodgers and Poor-designed monument in December 1930. The contract documents were released shortly afterward (Specifications for Construction of Wright Brothers Memorial 1930). The Office of the Quartermaster General appointed Marine Captain John A. Gilman as the Constructing Quartermaster of the site. The Wills and Mafera Corporation of New York won the bid for general contractor around the same time, quoting a low bid of $213,000 for the monument and a powerhouse at the foot of the main Kill Devil Hill (Hewes 1967:37, 41). Construction specifications, dated November 1, 1930, called for a granite tower, 61 feet high, with a base measuring 36 by 43 feet (Specifications for Construction of Wright Brothers Memorial 1930). Plans called for the use of stainless steel for the metal fittings, except for roofing, flashing, and thresholds, which were copper and bronze. The tower included a light beacon, but the contract described only the mounting, not the installation of the light. The War Department designed the more utilitarian powerhouse that supplied electricity to the monument's beacon.

The contractors scheduled construction beginning February 1931 following the completion of Captain Kindervater's work on stabilization and road construction. Materials arrived late, delaying the project start to October of that year.

Wills and Mafera received bids for granite from a number of companies in New England and North Carolina. The Sargent Granite Company of Mount Airy, North Carolina, received the contract award. The same company provided the material for the Arlington Memorial Bridge in Washington, D.C., and for the Gettysburg Memorial in Pennsylvania, two other important federal projects of this period, securing their reputation (Elizabeth City *Independent* 11/18/32). The stone traveled to the site by railroad via Norfolk and Elizabeth City and then by barge and truck to the Kill Devil Hills reservation. The bridge at Kitty Hawk opened that spring (Stick 1958), and allowed smaller pieces to be delivered directly by truck. Larger stones required on-site rails for moving *(The Baltimore Sun* 8/28/32).

Work on the star-shaped granite base began in December 1931. Granite blocks were lifted into place by a crane mounted on the hillside. In all, the project required nearly 1,200 tons of granite, more than 2,000 tons of gravel, more than 800 tons of sand, and nearly 400 tons of cement (Elizabeth City *Independent* 9/23/32). Each construction crew averaged more than fifty men. Many local residents participated in the construction, giving them their first experience with government-sponsored projects on the Banks (Hewes 1967:41-42).

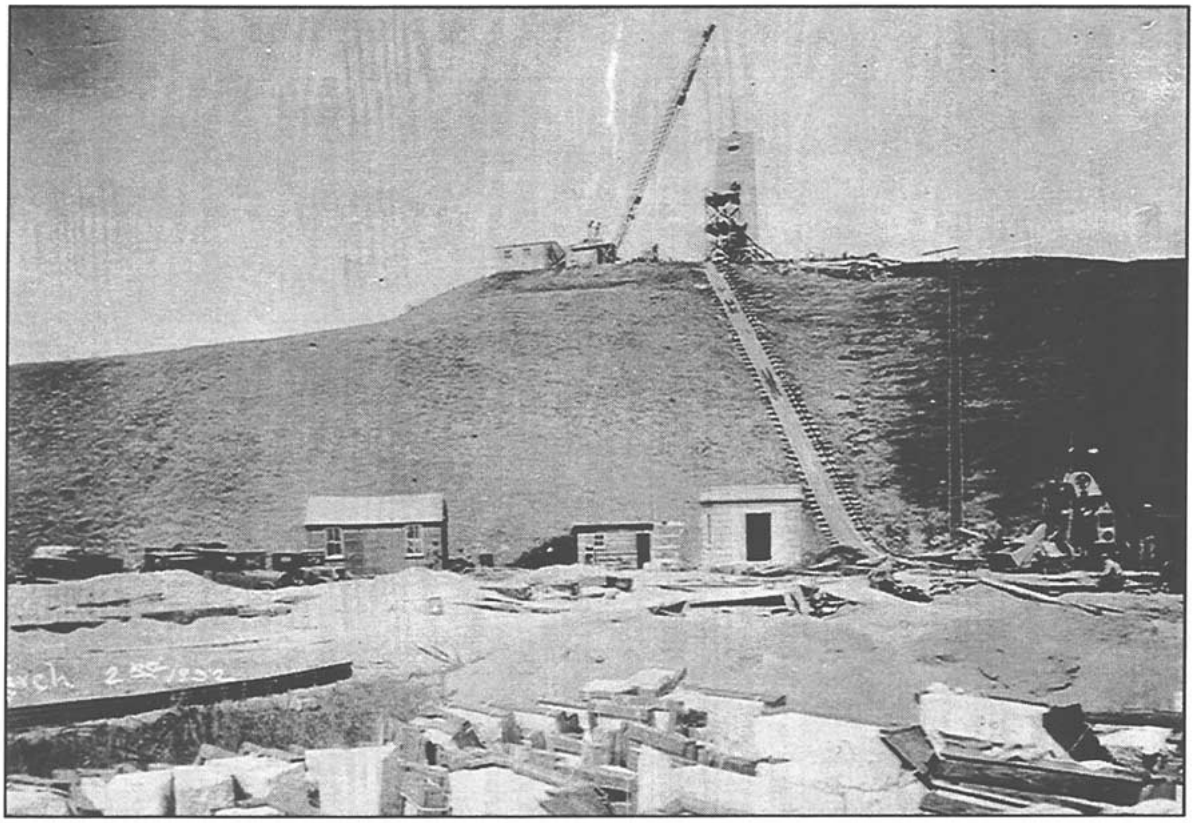
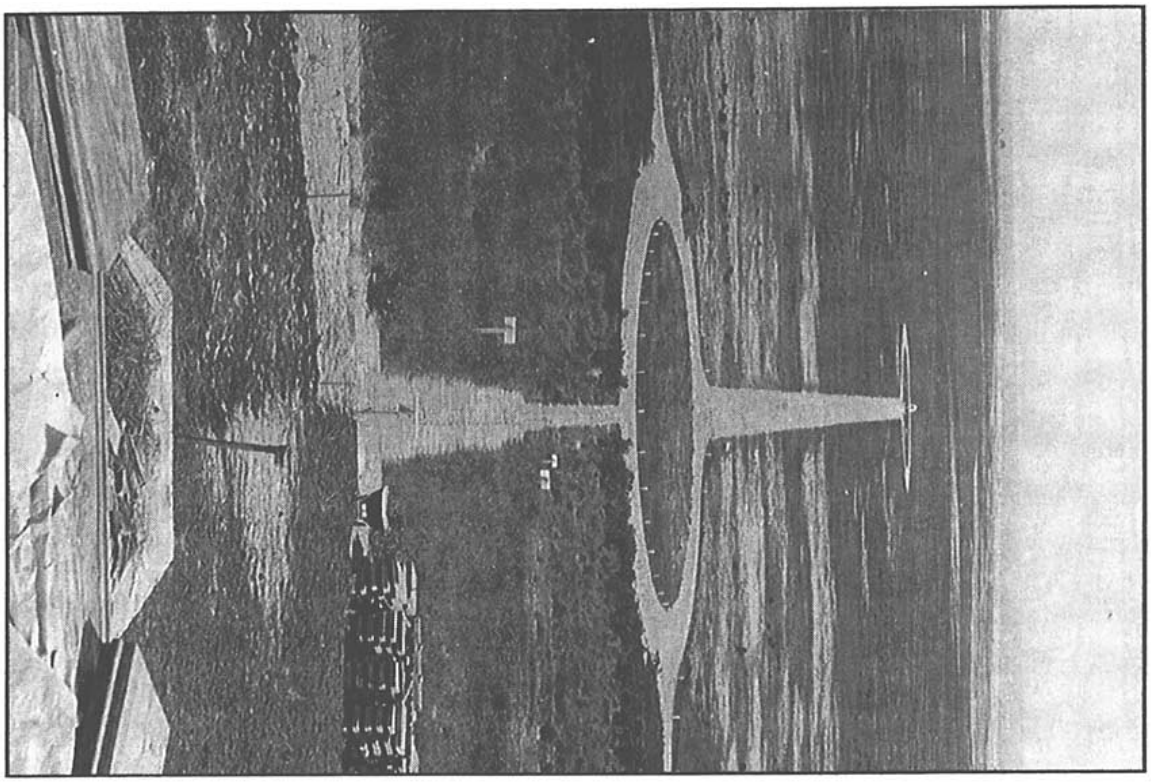
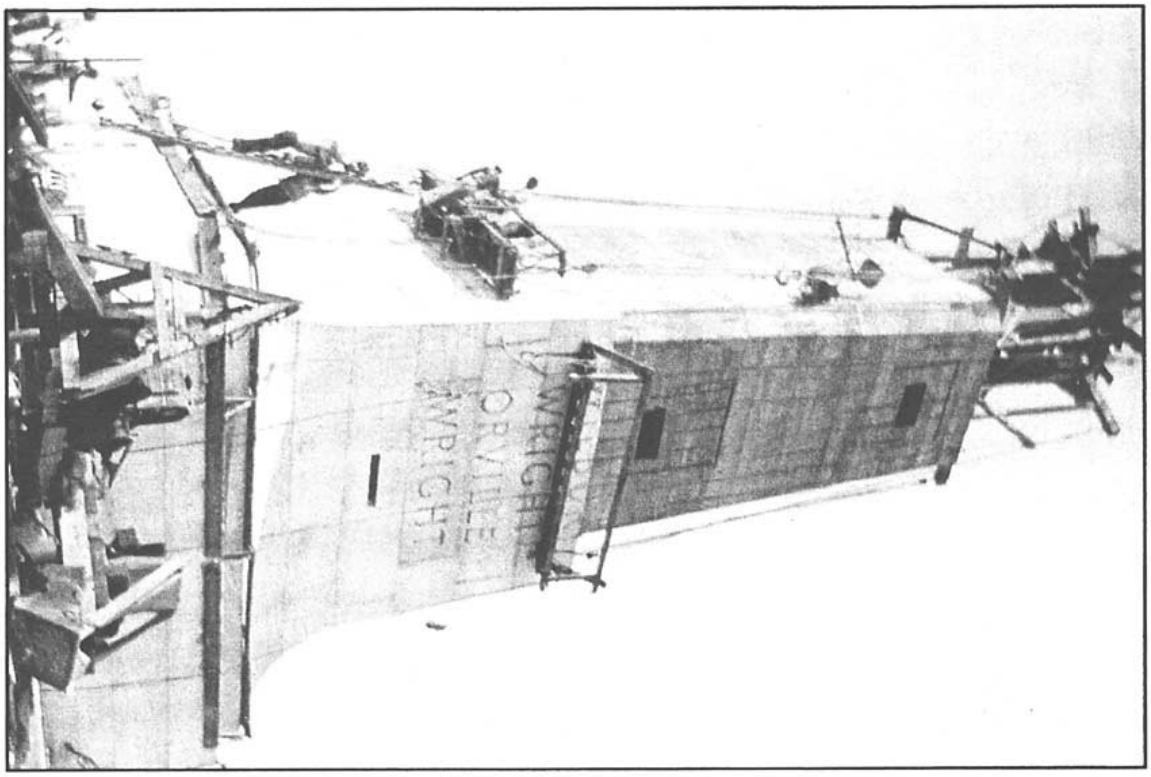


Figure 12 Monument Construction Using Crane; Powerhouse at Base of Hill, 193l-32

The crews completed the monument construction in November 1932. By this time the site included the new monument on top of the big hill and its associated powerhouse, the original granite marker north of the new monument, a road from state route 158 leading to the park boundary, a park road circling the east side of monument hill and turning due north to circle the granite marker, and a straight pedestrian trail leading from the road at the base of Kill Devil Hill to the monument. The War Department placed the memorial under the jurisdiction of the Commanding General of the Fourth Corps Area and appointed a caretaker to maintain and protect the monument. The Quartermaster General recommended Joseph Partridge, a local resident who worked as a foreman on the project, for the job of caretaker. Orville Wright and "25 outstanding citizens" including President Hoover, favored Captain William (Bill) Tate, the former Kitty Hawk postmaster who played such a central role in attracting the Wrights to the site in the first place. Surprisingly, the Quartermaster General selected Partridge. When Partridge died early the following year, Kindervater served as a temporary replacement, receiving help from an unskilled laborer (Hewes 1967:42).

Plans for the dedication of the monument began the summer before the scheduled completion date of October 1, 1932 (Elizabeth City *Independent* 12/26/32). Despite a pending presidential election, General Louis H. Bash, the Acting Quartermaster General, chose November 19, the Saturday after elections, as the dedication date. Soldiers from Fort Monroe, Virginia,

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volunteered to participate in the ceremony (Elizabeth City *Independent* 12/18/32). The U.S. Navy planned to send a dirigible, and the Army a bomber and fighter squadron for an aerial display. Members of Congress, local dignitaries, military officers connected with the project, well-known aviators, and aircraft manufacturers, as well as the President of the United States, received invitations to the event. Orville Wright headed the list as the guest of honor. Boats chartered from Washington provided a round-trip excursion fare of $7.50. Organizers provided bleachers for 2,000 people and parking for 1,000 cars. In all, they anticipated as many as 20,000 spectators *(The Washington Post* 11/20/32).

Dedication day arrived with heavy rains and high winds. Neither the dirigible nor the airplanes received permission to leave their bases, and estimated attendance reached no more than 1,000 *(The Washington Post* 11/20/32). General Bash acting as master of ceremonies, read a letter from President Hoover expressing his regret at not being able to attend. Refraining from any general address to the audience, Orville later confided that he felt the monument was "distinctive, without being freakish" *(The New York Herald Tribune* 11/20/32). At the end of the ceremony, aviator Ruth Nichols pulled a cord to officially mark the dedication of the monument. The cord released a well-drenched American flag concealing the word GENIUS in the inscription along the base of the monument:

IN COMMEMORATION OF THE CONQUEST OF THE AIR
BY THE BROTHERS WILBUR AND ORVILLE WRIGHT CONCEIVED BY
GENIUS
ACHIEVED BY DAUNTLESS RESOLUTION AND UNCONQUERABLE FAITH

While a few details still remained to be finished, including the beacon grill, the ventilator covers, and the entrance gates (these were under separate contract), the monument was complete.

THE NATIONAL PARK SERVICE AND ADDITIONS TO THE SITE

With the monument completed, the Quartermaster General planned further development of the site and the management of daily activities. To replace Partridge and his temporary replacement Kindervater, the Quartermaster General appointed local Outer Banks resident Horace Dough, beginning a long-time association between Dough and the site. Dough previously made his living as a boat builder, fisherman and for a short time, laborer on the monument. The new appointment made him acting caretaker beginning August 8, 1933 (Hewes 1967:47).

On August 10, 1933, jurisdiction over the Kill Devil Hills Monument National Memorial was officially transferred to the National Park Service (NPS), an agency seen by several officials, including former President Hoover, as the most appropriate to manage the site *(The National Parks Index* 1987). Dough's temporary appointment as caretaker became permanent early the following year. As a result of President Franklin D. Roosevelt's New Deal, the site received a windfall of Public Works Funds for operation and development work during the earliest period of Dough's caretakership. The Kill Devil Hills Memorial Association, responsible in many ways

for initiating the monument, pressed for completion of the proposed airstrip (see Elizabeth City *Independent* 8/26/32, 9/8/33). This required additional lands, which local advocate Frank Stick agreed to help secure. Although Park Service officials considered the costs prohibitive, they agreed in principle and moved toward taking options for additional purchases. In the meantime, park officials agreed that the windfall appropriation of $90,500 from Public Works be spent on improving the roads and trails; building a superintendent's residence; building a shelter and comfort station for visitors; providing additional fencing; supplying electrical service; and improving the landscape (Hewes 1967:50).

Roads and trails received a high priority in order to prevent future erosion of the site caused by visitors and to act as fire lanes, then considered of great importance for the newly planted hill (Hewes 1967:57). In all, the park built 2.04 miles of new roads and 1.99 miles of trails between 1934 and 1935. A major improvement included the construction of a curvilinear trail system around the monument, consisting of four circuitous trails of sandrock asphalt laid out in a symmetrical design on either side of a straight line axis from the monument to the First Flight Marker. Completed in July 1936, the curving trails replaced the War Department's straight path climbing up the hill and continue to serve as the main access to the monument. A new road was built from the park boundary at state route 158 circling the Kill Devil Hill for a distance of .9 miles and surfaced with a bituminous sand road mix. The circular road also included five symmetrically placed parking areas. The park retained the road from the hill to the granite marker and agreed to cooperate with the state of North Carolina for the construction of a road from state route 158 to the city of Colington. The completed Colington Road utilized a portion of the park road circling the Wright brothers monument (Hewes 1967:58).

Another feature of the site was the entrance gates, built before the park's transfer to NPS by the L.R. Broyhill Company of Hampton, Virginia, and then linked through the revised NPS plan to the new circular road. Roughly following the form of truncated obelisks, they suggested ancient Egyptian precedent. Extending about 9 feet above grade with approximately 30-inch-square, slightly projecting bases, they tapered to less than 24-inch-square at the top, where a recessed, pyramidal cap provided definition. Bronze combination panel and picket fence sections, fitted between the outer posts, and similarly designed moveable bronze gates, mounted on the two inner-most posts, guarded the entrance. The park built a small, concrete contact station, measuring about 18 by 22 feet, just to the west of the entrance. With a total floor area of 376 feet, the contact station served as the superintendent's or caretaker's office and the first point of contact with visitors. The contractors completed the entrance gates on June 24, 1933 (Hewes 1967:48). The Quartermaster General Corps supervised this construction and completed the complementary contact station the following year, just before transfer of the property to NPS (USDI, NPS Fixed Property Record). The gate posts, now abandoned and lacking their bronze gates, remain within the monument site. The contact station, outmoded by 1960 and first scheduled for demolition in 1963, was finally removed in 1978 (USDI, NPS Fixed Property Records).

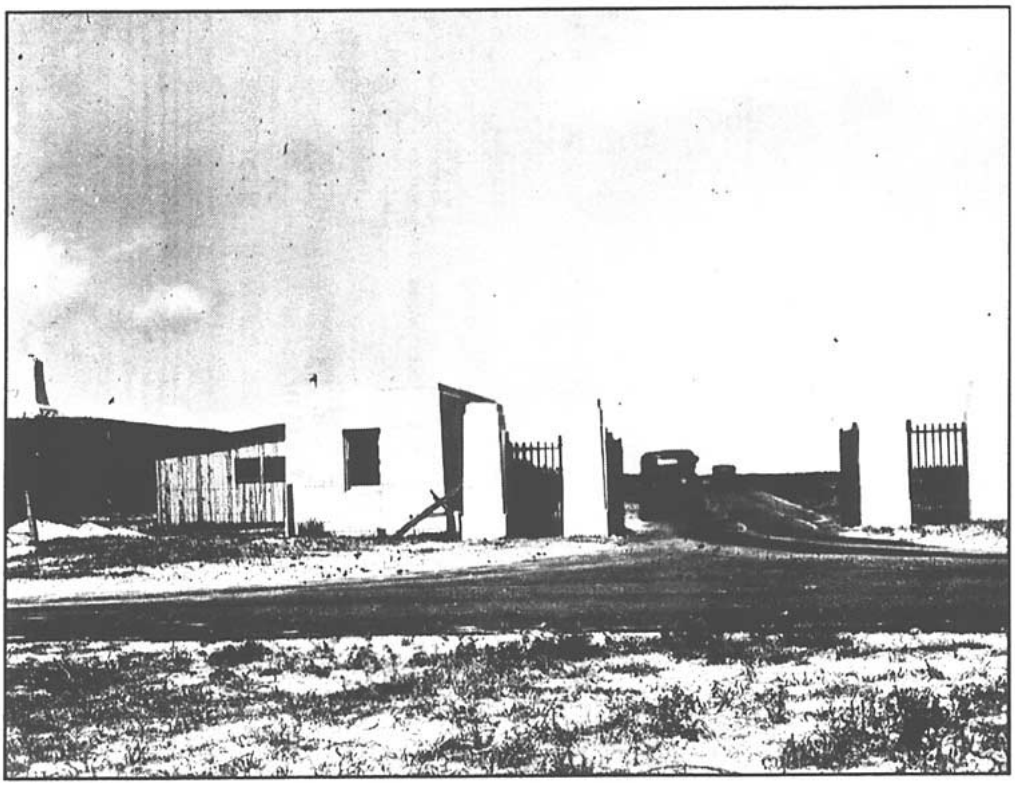

Figure 15 Contact Station, Entrance Gate, and Garage, c. 1935

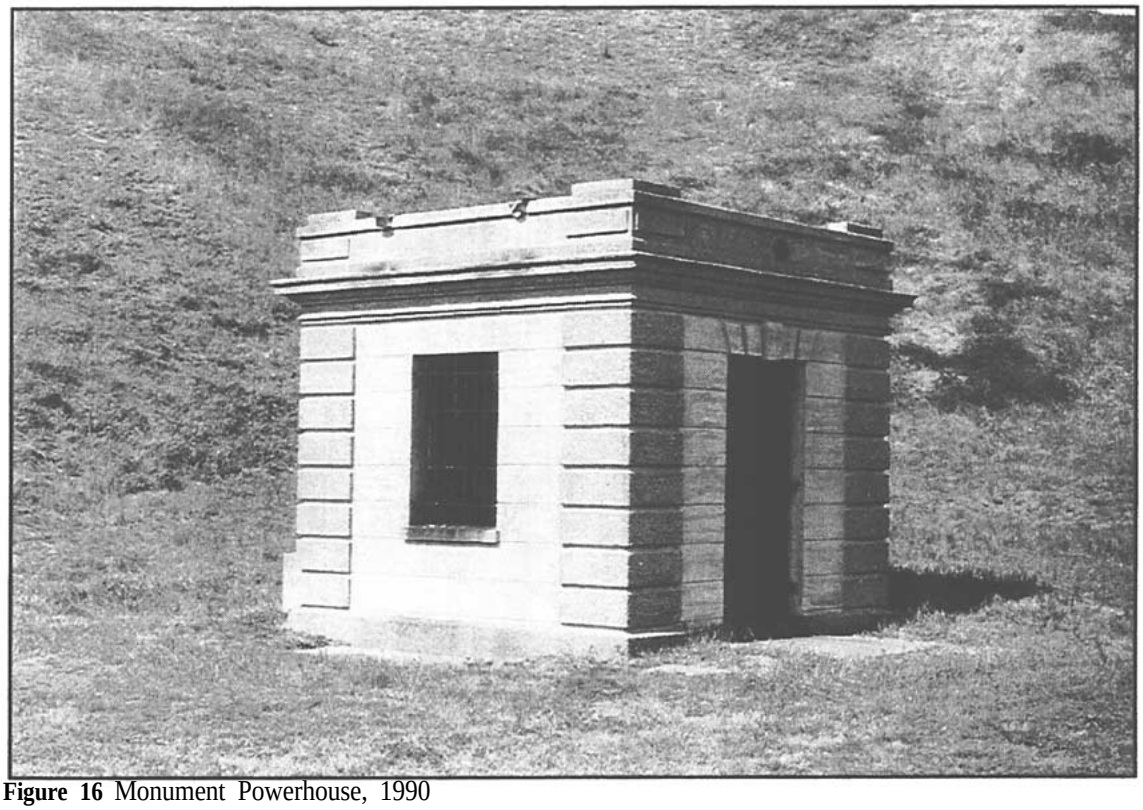

Figure 16 Monument Powerhouse, 1990

The powerhouse served as a utilitarian feature of the site during its earliest development period. Built in 1932, this small concrete structure housed the generator necessary for lighting the monument's beacon. Designed and built by Quartermaster Corps engineers, it followed the conventional Beaux Arts styling typical of many government projects in that period. Fitted with standard metal sash windows and metal doors, the building employed scored concrete resembling ashlar stone work and included decorative quoins and keystones. Overall dimensions were 12 by 12 feet. By the late 1930s the introduction of conventional power sources outmoded the building's function. Its equipment served, however, as a source of auxiliary power until 1954, though even in 1940, during a power outage, it failed to perform that function (Wright Brothers National Memorial, 106 Statement n.d.). The building remains as a reminder of the monument's original dual function as a memorial and aviation beacon.

Major new additions to the site during the early NPS period included the superintendent's quarters, with an associated access road, and a comfort station for visitors. Architect J.R. Thrower prepared the designs for both, sending first versions of the plans to Horace Dough late in 1934 (Hewes 1967:58). Charles Peterson, the founder of the Historic American Buildings Survey program, signed the drawings as Supervisory Park Architect (Construction Drawings Fort Raleigh 9/20/34; signed 10/2/34). Construction of the comfort station and the superintendent's quarters began in October 1935 (Horace Dough to Thomas C. Vint 8/16/37) and ended in 1936.

The simple, two-bedroom 1,141-square-foot superintendent's quarters featured Art Moderne elements designed to create a streamlined effect, including a flat roof with parapet walls, common bond yellow brickwork banded by header rows, stone coping, and partial stringcourses. Grouped windows originally featured metal sashes and frames. The design included a living room kitchen, two bedrooms, separate office at the northeast comer, and recessed terrace along the north side. At a later date, NPS replaced the original copper-sheathed roof with slag and pitch (asphalt). NPS required Superintendent Horace Dough to move from his longtime home in Manteo to live at the site. As a result, he commuted nearly every evening to visit family and friends (Hewes 1967:59).

The comfort station, located north of the superintendent's quarters near the base of the monument hill and directly on axis with the powerhouse, featured a more streamlined character than Dough's residence. (Superintendent's Monthly Report 8/36). NPS constructed this small, brick, flat-roofed, rectangular building with strongly emphasized brick banding and a sharply cantilevered roof, protecting the two south-facing entrances. Concrete pathways linked the building to the park's circulation system. NPS completed construction in April 1936 and removed the building around 1977, at about the same time as the contact station (USDI, NPS Fixed Property Record).

In addition to the superintendent's quarters and the comfort station, NPS added a number of other essentially utilitarian structures to the site during the late 1930s and early 1940s. The park erected an 85-foot steel flagstaff in a triangular open space southeast of the hill, just northwest of the entrance in 1936 (USDI, NPS Fixed Property Record). In 1939, the park added a

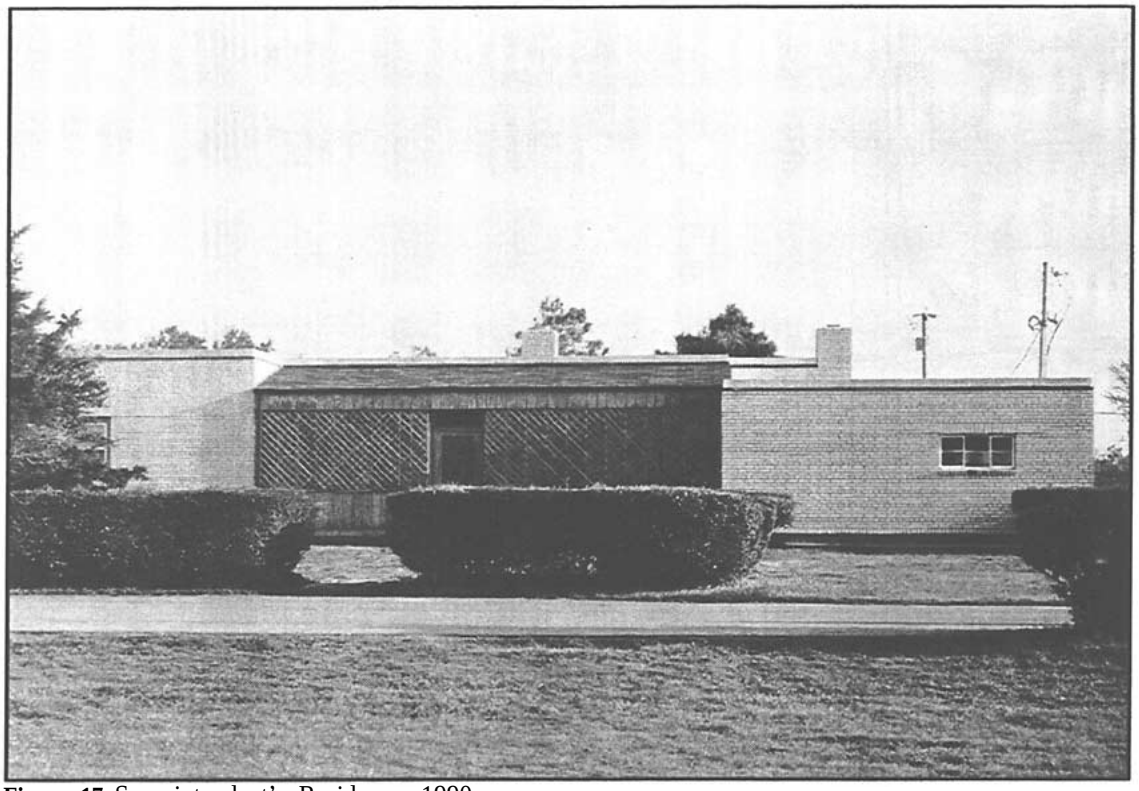

Figure 17 Superintendent's Residence, 1990

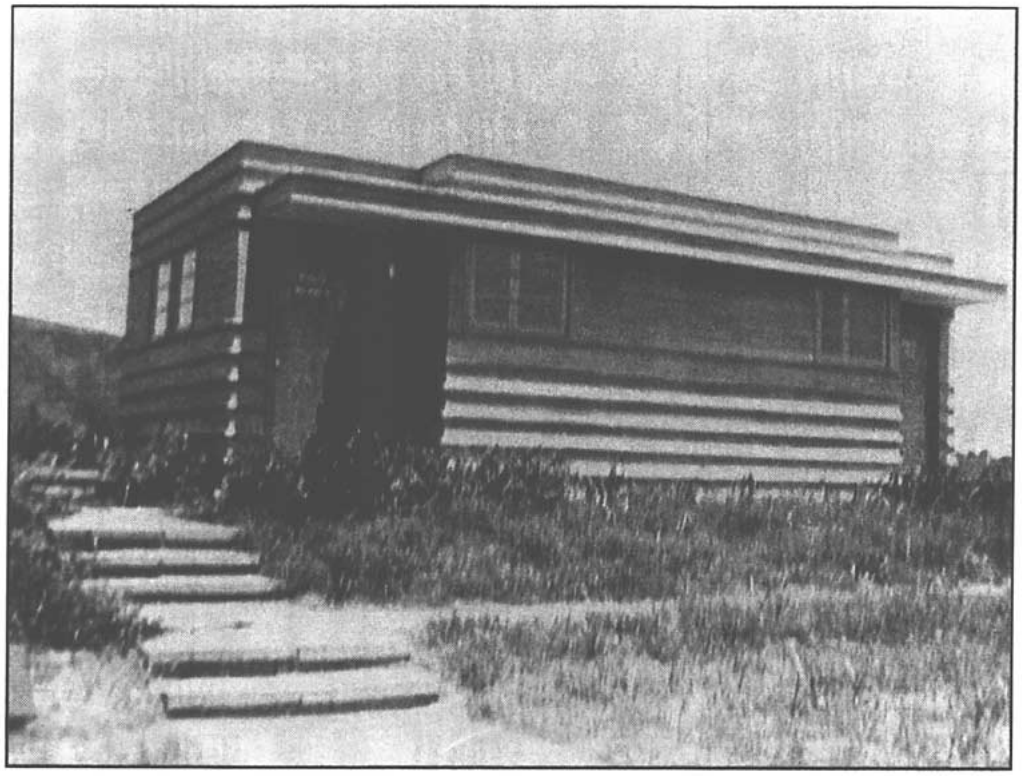

Figure 18 Comfort Station, c. 1936

wood-frame maintenance shop and storage building (Horace Dough to the Director NPS, 2/8/38), located in the maintenance area adjacent to the superintendent's quarters, and in 1941, a second, smaller workshop and storage building located next to the west boundary of the park (Superintendent's Monthly Report 8/41). The park significantly altered these structures over the years and removed the flagstaff after 1963.

Landscape improvements began in 1934 when the park stabilized the remaining grounds through grass planting and protected the site by constructing a wire fence along the entire park boundary. In 1936, Greenbriar Farms of Norfolk, Virginia, lined the circular road with trees and planted grass and shrubs. By the late 1930s a "mall" defined the space between the monument and the granite marker with vegetation lining a mown lawn. Vegetation outside the mall was released to natural succession. Fertilizing, seeding, and the construction of an artificial foredune along the coast of the Outer Banks encouraged the scattered growth of shrubs and other vegetation on the previously barren landscape.

Visitors arrived in greater numbers during the late 1930s following the opening of bridges and highways and general development of the area. NPS floodlit the monument beginning in 1936, creating an enthusiastic public reaction. Increased visitation encouraged a number of concessionaires to sell postcards and pamphlets at the site. W.O. Saunders of the Elizabeth City *Independent* and longtime supporter of the Memorial, wrote a *Handbook of the Wright Memorial.* Through a casual arrangement with the superintendent he sold the book privately at the monument base (Hewes 1967:60).

Proper policing of the site was difficult, and Dough reported numerous instances of petty vandalism including damage to the monument by souvenir hunters. Dough pressed for additional money to hire a night guard, a post finally funded in 1937. There were numerous other logistical and public relations problems for Dough. The Junior Birdmen of America received permission to produce a model of the monument as a trophy. Dough often had to entertain visiting dignitaries, taking them on fishing expeditions as part of his unofficial duties.

The idea of constructing an airstrip continued to receive attention from park supporters. In 1936, projected improvement costs for the period 1938-1943 totaled $143,500. Proposed changes included adding another utility building (built in 1941); a second employee's residence (never realized); lightning protection for the monument; sewage, water, and power lines; additional road construction; further path construction; and more parking. Cost of the proposed airstrip added $1,000,000 to this figure, without deterring supporters (Hewes 1967:64).

In addition to its projected cost, the location for the airstrip remained a major issue. The area south of the monument seemed most probable, due to the high costs of land to the north and the lack of space to the west. In order for the airstrip to be useful as more than an exhibit (one projected use included Coast Guard operations), the park needed a minimum of 523 acres. Alfred Poor, the architect for the monument, offered to design the airstrip. He emphasized that the original plan for the memorial included an airfield south of Kill Devil Hill, which influenced the design and orientation of the monument. In July 1939, the park laid out a schematic airstrip design south of the monument. At this time, however, Roy Knabenshue, charged with working

out acquisition costs and other problems, concluded that building costs at the south end would be prohibitively high due to the necessary removal of a large sand dune (Hewes 1967:64). NPS shelved the whole project, and World War II postponed all further development.

WORLD WAR II AND POST-WAR CHANGES AND PROPOSALS

World War II brought development at the Wright Brothers Memorial to a complete halt. A lack of funding forced NPS to reduce staff at the park and cut money for basic needs, such as fertilizer, and the federal government utilized its land for wartime purposes—the U.S. Navy added a submarine monitoring station to the monument for a short time (Hewes 1967:72). Both NPS and the supporting Kill Devil Hills Memorial Association continued to plan for the future and completed a new Master Plan by 1942. In 1941, Orville Wright announced the return from England of the Wright *Flyer,* displayed at the Science Museum in South Kensington since 1928 (Crouch 1978). The Kill Devil Hills Memorial Association began a campaign to secure the plane in a museum at the site, a continuation of earlier museum plans, and proposed "an appropriate ultra-modem aviation museum" in 1942. While the Smithsonian Institution remained a likely recipient of the plane, Orville Wright's long-standing feud with Langley's supporters fueled the Association's hopes of receiving the *Flyer.* Following Orville Wright's death in 1948, speculation continued that the *Flyer* might be placed at the Kill Devil Hill Monument (Elbert Cox to the Director, NPS 6/3/48), but the Smithsonian eventually received the plane, as stipulated in Orville Wright's will (Oehser 1970: 100; Hewes 1967:94).

The war's end returned basic maintenance funds to the park, but the 1942 Master Plan never became reality. In 1947, the park drew up another Master Plan, broadening the purpose of the park to include an overlapping layer of interpretation. Floodlighting of the monument resumed in 1947, and the park undertook several basic repairs on the main structure. The 1947 plan prompted the acquisition of an 800-by-2,000-foot strip of land to the west of the park and the state rerouted the road south of the monument, no longer utilizing the Memorial's road system (Superintendent's Monthly Report 5/47).

Work at the park in the 1950s and 1960s included implementation of the 1947 Master Plan's overall physical program for the site. These changes altered the park's orientation and focus. In 1957, the park added an entrance road on the east at state route 158, outmoding the old entrance gateway on the south. In 1963, the park removed the metal gates and fencing from the old entrance and in 1977 demolished the contact station (USDI, NPS Fixed Property Records; Joseph Brown, Regional Director to North Carolina Department of Natural Resources 11/10/78). The comfort station was also demolished and a new circulation system introduced (Amundson 1987). In 1960, the park added a new visitor center and parking area east of the granite marker and northeast of the stabilized hill and Wright Brothers Monument, one of the most significant changes to the site in this period of development. Designed by the Philadelphia firm of Mitchell/Giurgola, later designers of the Liberty Bell Pavilion near Independence Hall, the new concrete visitor center suggested the form of an airport terminal, reminiscent of Eero Saarinen's Dulles International Airport outside Washington. It also conveyed a sense of

connection between the achievements of the Wright brothers and the world of modern air transportation. The building was one of several Mission 66 projects sponsored by NPS to upgrade National Park buildings and facilities in anticipation of the fiftieth anniversary of the Service, serving as museum, lecture hall, gift shop, and administrative offices for the park. The 1960 closure of the Wright Brothers Monument's interior to visitors shifted the focus to the new visitor center.

Figure 19 Visitor Center, c. 1960

The physical alterations of the 1950s and 1960s represented not only changes in the overall character of the monument, but also an expansion of the aims of the Memorial. Both the granite marker and the larger monument served as traditional commemorative structures. They emphasized veneration of the innovations and singular achievements of the Wright brothers. Changes of the mid-twentieth century sought to provide interpretation and education about the international significance of the Wright brothers' work in addition to commemoration. In 1951, encouraged by the interest of the Kill Devil Hills Memorial Association (renamed the First Flight Society in 1966), NPS embarked on a campaign to introduce a new series of educational exhibits. In 1953, the park reconstructed the Wright brothers' hangar and quarters buildings on their approximate original sites-relying on the placement of the granite marker as a point of reference. Exhibits proposed for the new museum were installed after its completion. The most

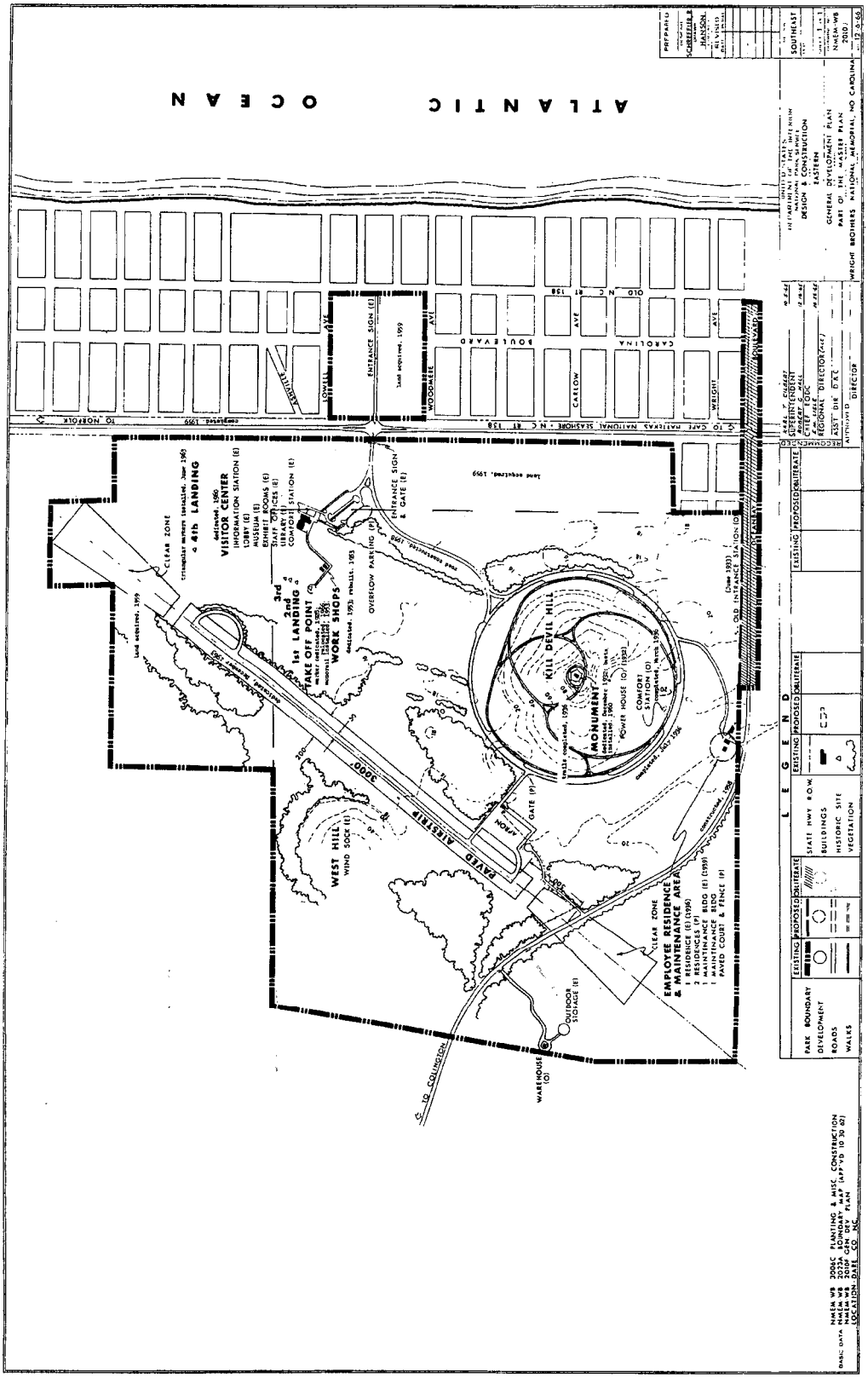

Figure 20 Wright Brothers National Memorial, 1965-66 General Development Plan

dramatic exhibit featured the reconstructed 1903 *Flyer* built by the Washington Section of the Institute of Aeronautical Sciences and donated to the museum in 1963 (Hewes 1967:94).

The last major addition to the site was the long dreamed-of airstrip. In November 1959, the Avalon and Old Dominion Foundations of New York gave $82,000 to NPS to acquire the additional land necessary for the airstrip. Constructed in 1963 to the north and west of the visitor center, the airstrip was functional in design, allowing small planes to land at the site, but it did not represent a formal addition to the commemorative landscape. Another major change to the site (other than the periodic reconstruction of the hangar and quarters) included the realignment in 1966 of the 1928 granite marker so that it faced visitors approaching from the reconstructed camp buildings. The park also leveled the small mound supporting the marker so the topography appeared more as it did during the Wrights' efforts.

Reconsideration of the Memorial's name continued to plague the park in the post-war years. Dough suggested the name be changed from the original "Kill Devil Hill Monument," also officially designated in 1942 as the "Kill Devil Hill Monument National Memorial," to the "Wright Brothers First Flight Memorial." Regional historian Roy E. Appleton agreed. However, as late as 1948, the park considered alternative titles. NPS chose the present name, the "Wright Brothers National Memorial," in 1953 (USDI Order 18FR7877, *Federal Register* 12/1/53).

CONCLUSIONS

The Wright Brothers National Memorial is a unique monument to the achievements of Orville and Wilbur Wright and their experiments with gliders and powered flight, conducted at the site between 1900 and 1903. While no historic structures associated with the seminal event remain, the commemorative additions to the site, including the granite First Flight Marker, the monument's curving trails and circular road, the unequaled Art Deco-inspired Wright Brothers Monument and associated powerhouse, and the spatial relationship between the marker and the monument, have achieved their own significance. These features represent local and national efforts to recognize the Wrights' achievements. In addition, the monument is an outstanding example of commemorative architecture of the period. Several much-altered ancillary structures from the commemorative period, including the gate posts, maintenance buildings, and the superintendent's quarters, also remain though changes in the overall plan of the site and individual losses of integrity diminish their relative significance.

ASSOCIATED RESOURCES

The Setting

The Wright Brothers National Memorial is a complex site, representing many years of additions, subtractions, and layering. The most important elements are those associated with early commemoration of the site including the granite First Flight Marker, placed in 1928 to mark the point of liftoff of the first powered flight; the Wright Brothers Monument, added in 1931-1932 and an outstanding, nationally significant example of commemorative architecture; the monument's associated powerhouse, completed 1932; the monument's curving trails and circular

road, completed 1936; and the spatial relationship between the marker and monument, established in 1928. Other structures and features lost integrity through additions or alterations, represent the shift from commemoration to interpretation initiated with the 1947 Master Plan or postdate the period of significance for this context. These include the remnants of the original War Department-era entrance gates, the superintendent's quarters and other staff housing, the maintenance area, the post-1947 circulation system, the reconstructed hangar and quarters, the visitor center, and the airstrip.

Physical Characteristics

The significant features for the 1926-1941 commemoration context include: the granite, boulder-shaped First Flight Marker, placed in 1928 at the approximate liftoff point for the first flight; the Rodgers and Poor-designed Wright Brothers Monument of 1931-1932, a granite Art Deco-inspired monument in the form of stylized wings on a star-plan stone terrace; the monument powerhouse, a War Department-designed, concrete structure typical of federal Beaux Arts designs of the period; the monument's curving trails and circular road, completed in 1936, that encouraged visitors to visit the commemorative monument; and the spatial relationship between the monument and the marker established in 1928 by the earliest commemorative efforts for the site. The area between the marker and monument is a 2,000-foot-long zone running north to south and bounded on the east and west by drainage ditches dug by the National Park Service.

Associative Characteristics

The commemorative structures, circulation around the monument, and the important axial relationship between the marker and monument were all established before 1941. They represent the realization of the intended commemorative purpose of the park through a formal design under War Department and NPS management. Subsequent development focused on the interpretation of the Wrights' innovations and visitor access through the construction of a new visitor center, circulation system, airstrip, and reconstructed hangar and quarters buildings in the 1950s and 1960s.

Significance

The resources are significant under National Register Criterion A for their association with efforts to recognize, commemorate, and preserve the site of the Wright brothers' experiments and successes in flight in the dunes at Kill Devil Hills between 1900 and 1903. They are also significant under National Register Criterion C as representative of the commemorative architecture and landscape design of the site. The First Flight Marker and the Wright Brothers Monument are nationally significant; the powerhouse, the curving trails and circular road around the monument, and the spatial relationship between the marker and monument are significant at the state level.

Requirements for Listing

The Wright Brothers National Memorial was listed in the National Register of Historic Places on October 15, 1966. NPS personnel submitted documentation for the district in 1978. The submitted documentation references the monument, reconstructed hangar and quarters, residential area including the superintendent's quarters, airstrip, visitor center, maintenance area, and paved walks. No mention is made, however, of the 1928 granite marker, the powerhouse, or the abandoned memorial entrance gates, and the text does not include a list of contributing and noncontributing elements. Many of the resources mentioned in the original documentation are not contributing elements of the district. Information provided in this study will be used to complete additional documentation for the district that will clearly define contributing and noncontributing resources and establish a 1900-1941 period of significance for the district.

The Wright Brothers National Memorial district is nationally significant under National Register Criteria A and B. Specific features are also eligible for listing in the National Register under Criteria A and C. These include the nationally significant Wright Brothers Monument and First Flight Marker as well as the powerhouse, the monument's curving trails and circular road, and the spatial relationship between the monument and marker, which possess significance at the state level. Other associated properties, including the superintendent's quarters and the remnants of the gates, which are connected to the developmental history of the site, are not eligible due to a substantial loss of integrity. The visitor center and airstrip are not eligible because they are less than fifty years old and do not meet the requirements of National Register Criteria Consideration G. In addition, they postdate the period of significance and do not further the commemorative program established prior to 1941.

Criteria Considerations

Criteria Consideration F, "Commemorative Properties," has been considered in the evaluation of properties associated with this context. Commemorative properties are those:

> designed or constructed after the occurrence of an important event or after the life of an important person. They are not directly associated with the event or with the person's productive life, but serve as evidence of a later generation's assessment of the past. Their significance comes from their value as cultural expressions at the date of their creation. Therefore, a commemorative property generally must be over fifty years old and must possess significance based on its own value, not on the value of the event or person being memorialized (National Park Service 1991:39).

The granite First Flight Marker, the Wright Brothers Monument and its associated powerhouse, the monument's curving trails and circular road, and the spatial relationship between the monument and marker remain as elements of the commemorative development of the site and meet these requirements.

Integrity

The marker, monument, powerhouse, monument's curving trails and circular road, and spatial relationship between the marker and monument generally retain overall integrity of location, design, setting, materials, workmanship, feeling, and association. As a group, these elements represent the core of the earliest commemorative development period at the park. Individually, they illustrate the specific commemorative and utilitarian needs of the site prior to 1941. However, changes at the park since 1941 have affected the integrity of these resources. The Wright Brothers Monument lost some integrity of feeling and association following the move of the park entrance and the construction of the new visitor center in the late 1950s. The powerhouse lost a measure of feeling and association integrity after the discontinuation of the substation function of the building. The removal of the generating equipment from the powerhouse resulted in a small loss of materials integrity. The association of the powerhouse with the monument remains strong and offers an opportunity to interpret the original beacon feature of the monument. The reorientation of the 1928 First Flight Marker in 1966 reduced the resource's integrity of location, setting, feeling, and association. However, because the marker originally was placed at a location determined by the best estimates of surviving witnesses, it has never marked more than an approximate location. The small mound supporting the object was leveled to better convey a sense of the character of the terrain at the time of the original event and not mislead visitors. The side of the marker holding the bronze plaque was also turned to the east —it originally faced south—in order to be more visible to visitors approaching from that direction. The 1947 Master Plan and subsequent changes to the site significantly altered the circulation system and the spatial relationship between the monument and marker. The new roads, trails, and visitor center changed the visitor experience at the site, shifting the focus to interpretive exhibits at the museum and reconstructed hangar and quarters buildings and away from the commemorative monument and marker.

The original entrance gateway, superintendent's quarters, and maintenance area have all undergone substantial alterations and therefore lack sufficient integrity. They are also utilitarian structures and were never part of the core commemorative landscape at the park. The park closed the original entrance gate to the memorial in 1958 when they built a new entrance road at state route 158. The park abandoned the road, removed the bronze gates from their posts in the 1960s, and destroyed the contact station in 1978. The gate posts are the only surviving elements of the entrance. As a result, the gates lost a significant amount of design, setting, materials, feeling, and association integrity. Alterations to the superintendent's quarters throughout the building's history affected its integrity of design, materials, and feeling. The park replaced the original roof in 1944, enclosed the front terrace in 1974, and replaced the original windows in 1974, significantly altering the few original Art Moderne design elements. These alterations also introduced new materials to the resource. The maintenance area has had numerous additions and alterations, with no attempt made to retain the original features of the 1930s-era design.

The visitor center, constructed in 1959-1960, does not meet the requirements of National Register Criteria Consideration G, which states that a property less than fifty years old must be "of exceptional importance" to be eligible. Because the visitor center was not part of the original commemorative development of the park, centering on the monument and First Flight Marker, its significance must be evaluated under Criterion C for its design. The visitor center was an early commission of the Philadelphia firm of Mitchell/Giurgola, which subsequently designed a number of more prominent buildings. The firm was formed only in 1958 and is still practicing, although both original partners have now retired. It is extremely doubtful that sufficient historical perspective exists to accurately evaluate the firm's importance. Most of the firm's important commissions date to the 1970s and 1980s, a period of intense controversy in the architectural profession that has yet to be viewed within anything approaching consensus by architectural historians.

Only a handful of the exceptionally important architectural works from the post-World War II period, such as Eero Saarinen's Gateway Arch (St. Louis), Skidmore, Owings and Merrill's Lever House (New York), and Ludwig Mies van der Rohe's Illinois Institute of Technology campus (Chicago) are listed on the National Register. Even considered within the body of Mitchell/Giurgola's work, the visitor center is a minor commission, both in scale and in the attention it has received from the architectural press and architectural historians. More distinguished works of the firm, such as the United Fund Headquarters (Philadelphia, 1971), the College Center, State University of New York (Plattsburgh, New York, 1974), and the IBM Westlake Park Office Complex (Dallas, 1984-1990) are not on the National Register. The visitor center is not the firm's only North Carolina commission. The Davis Library at the University of North Carolina, Chapel Hill (1984) and the Weatherspoon Art Gallery at the University of North Carolina, Greensboro (1990) both are more representative of the firm's mature design philosophy.

Further militating against a finding of exceptional importance for the visitor center is the fact that several major alterations made in 1976 compromise the integrity of the design. At that time, a Florida firm was awarded a contract for the refenestration of the building. Resulting changes included replacements of all steel window frames with aluminum frames; new window glass; the removal of steel casement-type ventilation windows and replacement with larger, fixed-sash aluminum windows in the assembly room; and changes in the dimensions of doors and associated transom and side lights. Considering all these factors, the visitor center, although representative of its period of construction, does not rise to the level of exceptional importance required by Criteria Consideration G (Cape Hatteras Group Headquarters Contract files, 1975-1976).

Contributing Resources

1. First Flight Marker (constructed 1928; reoriented 1966)
2. Wright Brothers Monument (constructed 1931-1932)
3. Wright Brothers Monument Powerhouse (constructed 1931-1932)

4. Monument's curving trails and circular road with parking areas (constructed 1936)
5. Spatial relationship between monument and marker (established 1928)

Surveyed Non-contributing Resources

1. Maintenance Area (first building constructed 1939)
2. Memorial Entrance Gateway (constructed 1932)
3. Superintendent's Quarters (constructed 1936)
4. Wright Brothers Memorial Visitor Center (constructed 1959-1960)
5. First Flight Airstrip (constructed 1963)
6. Fee collection kiosk (constructed 1987)
7. Four stone landing markers (erected 1963, replaced 1993)
8. Metal information panel next to hangar (1966)
9. Metal information panel between marker and monument (1966)
10. Two Wright bust sculptures at monument
11. Plaque next to Visitor Center (placed by Soaring Society of America, 1963)